

PUBLIC VERSION

**UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C.**

In the Matter of

**CERTAIN ROAD MILLING
MACHINES AND COMPONENTS
THEREOF**

Inv. No. 337-TA-1067

FINAL INITIAL DETERMINATION

Administrative Law Judge David P. Shaw

Pursuant to the notice of investigation, 82 Fed. Reg. 40595 (Aug. 25, 2017), this is the initial determination in *Certain Road Milling Machines and Components Thereof*, United States International Trade Commission Investigation No. 337-TA-1067. It is held that a violation of section 337 of the Tariff Act, as amended, has occurred in the importation into the United States, the sale for importation, or the sale within the United States after importation, of certain road milling machines and components thereof, with respect to U.S. Patent Nos. 7,828,309 and 9,656,530. It is held that a violation has not occurred with respect to U.S. Patent Nos. 7,530,641 and 9,644,340.

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Table of Abbreviations

The following abbreviations may be used in this Initial Determination:

ABBREVIATION	FULL WORD OR PHRASE
ALJ	Administrative Law Judge
CDX	Complainant's Demonstrative Exhibit
CPX	Complainant's Physical Exhibit
CX	Complainant's Exhibit
Dep.	Deposition
EDIS	Electronic Document Imaging System
Enf.	Enforcement Proceeding
JPX	Joint Physical Exhibit
JX	Joint Exhibit
RDX	Respondent's Demonstrative Exhibit
RPX	Respondent's Physical Exhibit
RWS	Rebuttal Witness Statement
RX	Respondent's Exhibit
Tr.	Transcript
WS	Witness Statement

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I. Background

A. Institution of the Investigation

On July 19, 2017, complainant Wirtgen America, Inc. (“Wirtgen” or “Wirtgen America,” depending on the context) filed a complaint alleging that the Caterpillar respondents unlawfully import “certain road milling machines and components thereof[.]” Compl., ¶ 2. The complaint asserted the following five patents:

- U.S. Patent No. 7,530,641 (the “‘641 Patent”) (JX-0004);
- U.S. Patent No. 7,828,309 (the “‘309 Patent”) (JX-0005);
- U.S. Patent No. 9,624,628 (the “‘628 Patent”);
- U.S. Patent No. 9,644,340 (the “‘340 Patent”) (JX-0001); and
- U.S. Patent No. 9,656,530 (the “‘530 Patent”) (JX-0003).

Id.

By publication of a notice in the Federal Register on August 25, 2017, pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, the Commission instituted this investigation to determine:

[W]hether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain road milling machines and components thereof by reason of infringement of one or more of claims 1–5, 7–12, and 14–17 of the ‘340 patent; claims 1, 2, 5, 6, 9–22, and 27–29 of the ‘628 patent; claims 1–7, 13–24, and 26 of the ‘530 patent; claims 1, 2, 4, 6–8, 11, 12, and 15–17 of the ‘641 patent; and claims 1–3, 5–24, and 26–36 of the ‘309 patent; and whether an industry in the United States exists as required by subsection (a)(2) of section 337;

82 Fed. Reg. 40595 (Aug. 25, 2017). The Commission did not direct the administrative law judge to take evidence or hear argument regarding the public interest. *See id.*; 19 C.F.R.

§ 210.50(b)(1).

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The Commission named Wirtgen America, Inc. as complainant. The Commission named Caterpillar Bitelli SpA, Caterpillar Prodotti Stradali S.r.L., Caterpillar Americas CV, Caterpillar Paving Products, Inc., and Caterpillar Inc. as respondents. The Office of Unfair Import Investigations (“Staff”) was also named a party to the investigation, although the Staff later withdrew from the investigation.

B. Procedural History

The administrative law judge issued the procedural schedule on October 5, 2017. *See* Order No. 6 (Procedural Schedule). The procedural schedule set a target date of December 26, 2018, which is approximately 16 months after institution. *Id.*; *see also* Order No. 4 (Setting Target Date); 19 C.F.R. § 210.51(a); 19 C.F.R. § 210.42(a)(1)(i); 19 C.F.R. § 201.14(a).

In accordance with the procedural schedule, the parties filed initial claim construction briefs in December 2017, reply claim construction briefs in January 2018, and supplemental briefs in March 2018. *See* Order No. 6 (Procedural Schedule); Order No. 14 (granting joint motion to amend the procedural schedule).

On October, 31, 2017, the Staff filed a “Notice of Non-Participation” that stated “OUII will cease to participate” in the investigation.

On December 4, 2017, Wirtgen filed an unopposed motion seeking to terminate respondent Caterpillar Bitelli SpA based on the withdrawal of the complaint as to that respondent. The administrative law judge granted the motion in an initial determination, which issued on December 19, 2107. *See* Order No. 11 (initial determination not reviewed per Commission Notice (EDIS Doc. ID No. 634173)).

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On December 5, 2017, Wirtgen filed a motion seeking a summary determination that it has satisfied the economic prong of the domestic industry requirement. The administrative law judge denied Wirtgen's motion on January 19, 2018. *See* Order No. 16.

On January 29, 2018, Wirtgen filed an unopposed motion seeking to terminate the investigation as to multiple claims from the '340, '628, '530, '309, and '641 Patents. The administrative law judge granted the motion in an initial determination, which issued on February 5, 2018. *See* Order No. 20 (initial determination not reviewed per Commission Notice (EDIS Doc. ID No. 638181)).

On January 23, 2018, Wirtgen filed a motion seeking a summary determination that it has met the importation requirement. The administrative law judge granted Wirtgen's motion in part. *See* Order No. 23 (initial determination not reviewed per Commission Notice (EDIS Doc. ID No. 639371)). The initial determination held "that Wirtgen has shown Caterpillar Paving, Caterpillar Prodotti, and Caterpillar Inc. have met the importation requirement" in relation to the PM312, PM620, PM622, PM820, PM822 and PM825 cold planers. *Id.* at 14-18. The initial determination further held that the importation requirement had not been met with respect to products that contain the so-called 2018 product updates. *Id.* at 19.

On February 16, 2018, Caterpillar filed a motion seeking summary determination that its 2018 Product Updates to the PM600 and PM800 series road milling machines do not infringe the '309, '340, and '628 Patents. *See* Order No. 26 (March 29, 2018). The administrative law judge declined to adjudicate the 2018 product updates on summary determination, as Caterpillar failed to show that it was entitled to a summary determination as a matter of law that the 2018 product updates do not infringe the '309, '340, and '628 Patents. *Id.* at 3.

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On March 14, 2018, Wirtgen filed an unopposed motion seeking to terminate the investigation as to multiple claims from the '340, '628, '530, '309, and '641 Patents. The administrative law judge granted the motion in an initial determination, which issued on March 15, 2018. *See* Order No. 28 (initial determination not reviewed per Commission Notice (EDIS Doc. ID No. 641964)).

On March 14, 2018, Wirtgen filed an unopposed motion seeking to terminate the investigation as to the '628 Patent. The administrative law judge granted the motion in an initial determination, which issued on March 27, 2018. *See* Order No. 30 (initial determination not reviewed per Commission Notice (EDIS Doc. ID No. 643454)).

A prehearing conference was held on April 20, 2018, with the evidentiary hearing beginning immediately thereafter. *See, e.g.*, Prehearing Tr. (Apr. 20, 2018); Order No. 32 (Allocation of Hearing Time). The hearing concluded on April 24, 2018. *See, e.g.*, Tr. 939-940. The parties were requested to file post-hearing briefs not to exceed 300 pages, and to file reply briefs not to exceed 100 pages. *See* Pre-Hr'g Tr. 6.

On May 11, 2018, Wirtgen filed its post-hearing brief, which asserts the following claims:

- Claims 4, 5, 9, and 12 of the '340 Patent;
- Claims 2, 5, 16, and 23 of the '530 Patent;
- Claims 1, 7, 11, and 17 of the '641 Patent; and
- Claims 10, 29, and 36 of the '309 Patent.

See Wirtgen Br. at 11.

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Pursuant to Order No. 2 (Ground Rules), the parties also submitted a joint outline of the issues to be decided in the Final Initial Determination. *See* Joint Outline of Issues to Be Decided (EDIS Doc. ID No. 644951) (“Joint Outline”).

On August 9, 2018, the administrative law judge issued an initial determination extending the target date to February 1, 2019. *See* Initial Determination (Aug. 9, 2018) (not reviewed per Commission Notice dated Aug. 30, 2018).

C. The Private Parties

1. Complainant and Related Entities

a) Wirtgen

Complainant Wirtgen America, Inc. (“Wirtgen” or “Wirtgen America”) is a privately held Tennessee corporation, with a principal place of business at 6030 Dana Way, Antioch, Tennessee 37013-3116. Compl., ¶ 15.

b) Wirtgen GmbH and Wirtgen Group

Wirtgen’s complaint, pre-hearing brief, post-hearing brief, and post-hearing reply mention two Wirtgen-related entities, Wirtgen GmbH and Wirtgen Group, which both reside in Germany. Wirtgen does not provide much detail about these entities.

Caterpillar argues that Wirtgen GmbH and Wirtgen Group are largely responsible for “designing, developing, manufacturing, servicing, and supporting the domestic industry products.” Caterpillar Br. at 285. The parties do not dispute that the asserted patents were originally assigned to Wirtgen GmbH and that Wirtgen GmbH assigned the asserted patents to Wirtgen America in May 2017, before Wirtgen America filed the complaint. *See generally* JX-0011 (assignment for the ‘340 Patent); JX-0013 (assignment for the ‘530 Patent); JX-0014 (assignment for the ‘641 Patent); JX-0015 (assignment for the ‘309 Patent).

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c) Deere & Company

Deere & Company (*i.e.*, John Deere) acquired the Wirtgen Group in 2017. *See, e.g.*, RX-0408C; Order No. 22 (granting motion to quash subpoena served on Deere). Apart from opposing a subpoena, Deere did not participate in the investigation. *See, e.g.*, Order No. 22.

2. Respondents

a) The “Caterpillar” Respondents

“Caterpillar” collectively refers to respondents Caterpillar Prodotti Stradali S.r.L., Caterpillar Americas CV, Caterpillar Paving Products, Inc., and Caterpillar Inc.

b) Caterpillar Bitelli SpA

Caterpillar’s Response to the Complaint stated that “Caterpillar Bitelli does not exist as a legal entity” and disputed that Caterpillar Bitelli SpA was a proper respondent. Resp. at 2-3. Caterpillar Bitelli SpA was terminated from the investigation on December 19, 2107. *See* Order No. 11 (initial determination not reviewed per Commission Notice (EDIS Doc. ID No. 634173)).

c) Caterpillar Prodotti Stradali S.r.L.

Caterpillar Prodotti Stradali S.r.L. (“Caterpillar Prodotti”) is an Italian corporation with a principal place of business at Via IV Novembre, 2, I-40061 Minerbio BO, Italy. Resp. to the Compl. at 12-13.

d) Caterpillar Americas CV

Caterpillar Americas CV (“Caterpillar Americas”) is a Swiss corporation with a principal place of business at 76 Route de Frontenex, Boite Postale 6000, 1211 Geneva Switzerland.

Resp. to the Compl. at 13.

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e) Caterpillar Paving Products, Inc.

Caterpillar Paving Products, Inc. ("Caterpillar Paving Products") is an Oklahoma corporation with a principal place of business at 8401 85th Avenue North, Minneapolis, Minnesota 55445. Resp. to the Compl. at 13.

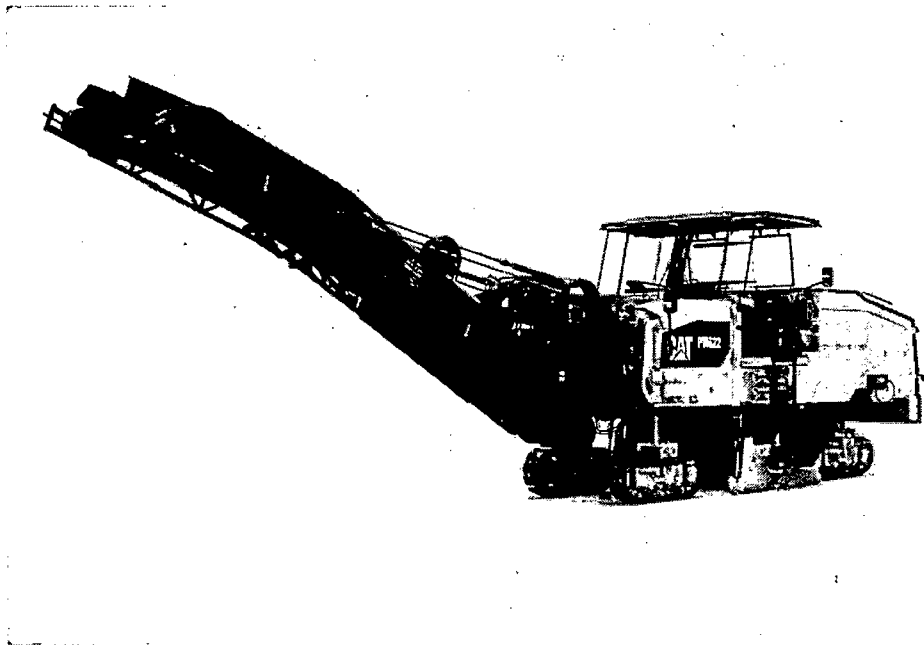
f) Caterpillar Inc.

Caterpillar Inc. is a Delaware corporation with its principal place of business at 100 NE Adams Street, Peoria, Illinois 61629. Resp. to the Compl. at 13. Caterpillar Inc. is the parent company of Caterpillar Prodotti, Caterpillar Americas CV, and Caterpillar Paving Products, Inc.

D. The Accused Products

1. Overview

The accused products are cold planers, which are large machines that remove pavement. CX-0062C features the following image of the PM620 cold planer:



CX-0062.0007.

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Wirtgen accuses Caterpillar's PM600 Series (*e.g.*, the PM620 and PM622 models) and PM800 Series (*e.g.*, the PM820, PM822, and PM825 models) cold planer machines of infringing the asserted claims from the asserted patents. Wirtgen Br. at 14. Wirtgen further accuses Caterpillar's PM300 Series (*e.g.*, the PM310, PM312, and PM313 models) cold planer machines of infringing the asserted claims of the '641 Patent. *Id.* Wirtgen submits that the parties have agreed that the PM620 model "is representative of the PM622 model and PM800 Series products for purposes of infringement." *Id.* (citing JX-0017C (Representative Accused Products Stipulation)). Wirtgen also submits that the PM312 model is representative of the PM310 and PM313 models. *Id.* As discussed below, the administrative law judge has determined that the PM620 model is representative of the PM600 Series and PM800 Series products, and that the PM312 model is representative of the PM300 Series products.

2. Products Imported "on or before December 31, 2017"

Wirtgen and Caterpillar filed a stipulation agreeing that the PM620 model is representative of the PM600 and PM800 series products and that the PM312 model is representative of the PM300 series products "imported on or before December 31, 2017." JX-0017C at 1-3.

3. Products Imported "after December 31, 2017" – the So-Called "2018 Product Updates"

Caterpillar argues that it has modified portions of the PM600 and PM800 series products; Caterpillar refers to the modified products as the "2018 Product Updates." Caterpillar argues:

The parties dispute whether, for the '340 and '309 patents, the PM620 Model may be representative of all machines imported after December 31, 2017. *Id.* Caterpillar has developed 2018 Product Updates for the PM600 and PM800 Series of Cold Planers (the "2018 Product Update Machines") relevant to the alleged infringement of these two patents. *See* Caterpillar's Motion for Partial Summary Determination of Noninfringement (Feb. 16,

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2018), EDIS Doc. ID 636793; RX-0993C (Engelmann Rebuttal Witness Statement) at Q/A 4-5. Relevant to the '340 patent, the 2018 Product Update Machines [

] *Id.* at Q/A 8; RX-0990C (Fronczak Rebuttal Witness Statement) at Q/A 64. And relevant to the '309 patent, the 2018 Product Update Machines [RX-0993C at Q/A 17-18; RX-0991C (Alleyne Rebuttal Witness Statement) at Q/A 385-386.

Caterpillar Br. at 7.¹

The administrative law judge addresses the 2018 products in the subsequent analysis. *See* Part II(C)(4), *infra*.

E. The Domestic Industry Products

Wirtgen introduces its products as follows:

There are sixteen models of domestic-industry products ("the DI Products") that can be grouped by three size categories: small, compact, or large. CX-0002C (Schmidt WS) Q25-28; CX-0010C (Allen WS) Q10. The small DI machines include the W50Ri and W60Ri (corresponding to series 1505). The compact machines include the W100Ri, W120Ri, W100Fi, W120Fi, W100CFi, W120CFi, W130CFi, W150i, and W150CFi models (corresponding to series 1610, 1310, 1810, 0613, and 0813). Finally, the large machines include the W200i, W210i, W220, W220i, and W250i models (corresponding to series 1420, 1520, 0522, 0722, and 0622). CX-0002C (Schmidt WS) Q25-28. These models are sometimes referred to by Series Number, as summarized below.

Wirtgen Model No.	Wirtgen Series No.
W200i	1420
W210i	1520
W220	0522
W220i	0722
W250i	0622
W50Ri	1505

¹ Any emphasis from the parties' briefs is generally omitted in this initial determination.

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Wirtgen Model No.	Wirtgen Series No.
W60Ri	
W100Ri	
W120Ri	1610
W100Fi	
W120Fi	1310
W100CFi	
W120CFi	
W130CFi	1810
W150i	0613
W150CFi	0813

The different model numbers relate to the size of the milling drum, and the suffixes after the model number relate to certain attributes of the machines that differ between the same model number. For instance, the suffix “i” denotes a model with a “Tier four final” engine (specifying that it meets certain emissions criteria). The “R” and “F” suffixes indicate the direction of the conveyor—whether it is a rear-facing conveyer (R) or a front-facing conveyer (F). The final suffix in the DI Products, “CFi,” denotes a compact front-load machine, or a front-load machine that has tracks instead of wheels, as other smaller cold-milling machines do.

The DI products that practice various claims of the Asserted Patents are summarized below.

Asserted Patent	DI Claims	DI Products
‘340 Patent (Improved Pivoting Scraper)	4, 5, 9, 12	W200i, W210i, W220, W220i, W250i, W150i, W150CFi
‘641 Patent (Safely Driving Backward)	1, 7, 11, 17	W200i, W210i, W220, W220i, W250i, W50Ri, W60Ri, W100Ri, W120Ri, W100Fi, W120Fi, W100CFi, W120CFi, W130CFi, W150i, W150CFi
‘530 Patent (Intelligent Leg Control)	2, 5, 16, 18, 23	W200i, W210i, W220, W220i, W250i, W50Ri, W60Ri, W100Ri, W120Ri, W100Fi, W120Fi, W100CFi, W120CFi, W130CFi, W150i, W150CFi

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'309 Patent (Four-Way Floating Axle)	10, 29	W200i, W210i, W220, W220i, W250i, W150i, W150CFi
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Wirtgen Br. at 15-16.

Caterpillar introduces Wirtgen's machines as follows:

In the Complaint, Wirtgen identified three categories of Domestic Articles: 1) Large Milling Machines; 2) Small Milling Machines; and 3) Compact Milling Machines. Compl. at ¶ 94. On October 27, 2017, Wirtgen filed its Identification of Products on Which It Will Rely to Satisfy the Domestic Industry Requirement. In relevant part, Wirtgen identified the following machines for each of the Asserted Patents: 1) the '340 patent— W200i, W210i, W220, W220i, W250i, W150i, W150CFi; 2) the '530 patent— W200i, W200Hi, W210i, W220, W220i, W250i, W50Ri, W60Ri, W100Ri, W120Ri, W100Fi, W120Fi, W100CFi, W120CFi, W130CFi, W150i, W150CFi; 3) the '641 patent— W200i, W200Hi, W210i, W220, W220i, W250i, W50, W50DCi, W50Ri, W60Ri, W60i, W100i, W100Ri, W120Ri, W100Fi, W120Fi, W100CFi, W120CFi, W130CFi, W150i, W150CFi; and 4) the '309 patent— W200i, W200Hi, W210i, W220, W220i, W250i, W150i, W150CFi.

On January 29, the parties submitted a Stipulation Regarding Representative Domestic Industry products. JX-0019 (Representative DI Products Stipulation). For the technical prong of the domestic industry requirement, the parties agreed that for each of the '340 and '309 patents: 1) the W150 CFi is representative of the W150i, and 2) the W210i is representative of the W200i, W220, W220i, and W250i. JX-0019.0002. The parties did not reach an agreement on representative machines for the purposes of the '530 and '641 patents.

Caterpillar Br. at 9-10.² As discussed below, the administrative law judge has determined that:

- For the '309 and '340 Patents, the W150CFi model is representative of the W150i and W150CFi models; and the W210i model is representative of the W200i, W220, W220i, and W250i models.
- For the '641 Patent, the W100Ri/W120Ri models are representative of the W50Ri, W60Ri, W100Fi, W120Fi, W100CFi, W120CFi, and W130CFi models;

² For the '530 and '641 Patents, Caterpillar fails to present any argument that the machines that Wirtgen identified are not representative.

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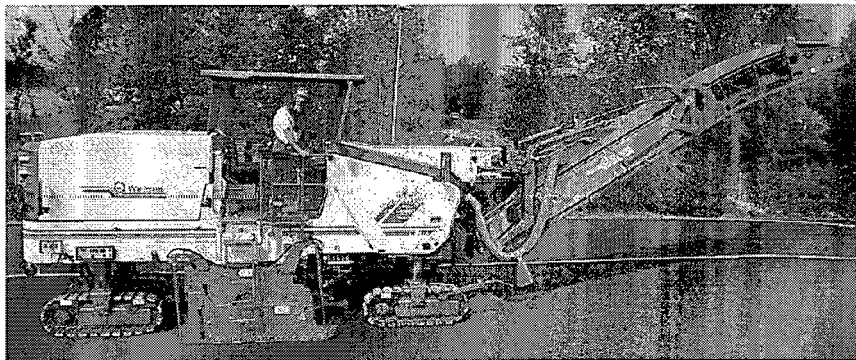
the W150CFi model is representative of the W150i and W150CFi models; and the W210i model is representative of the W200i, W220, W220i, and W250i models.

- For the '530 Patent, the W120Ri model is representative of the W50Ri, W60Ri, W100Fi, W120Fi, W100CFi, W120CFi, W130CFi, W100Ri, and W120Ri models; the W150CFi model is representative of the W150i and W150CFi models; and the W210i model is representative of the W200i, W210i, W220, W220i, and W250i models.

F. Technological Background

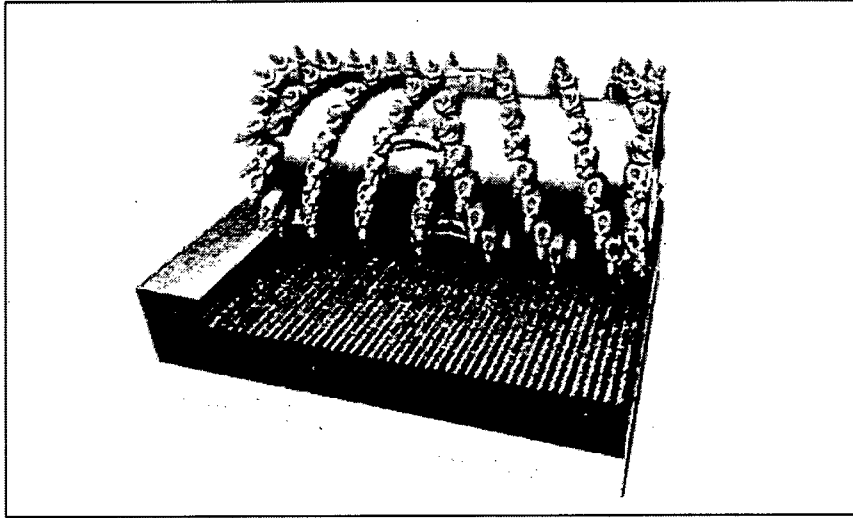
The parties submitted a joint technology stipulation on January 23, 2019, which was received into the record as JX-0018. The technology stipulation provides the following images and explanation:

The Asserted Patents relate to machines used in road construction, including road milling machines.

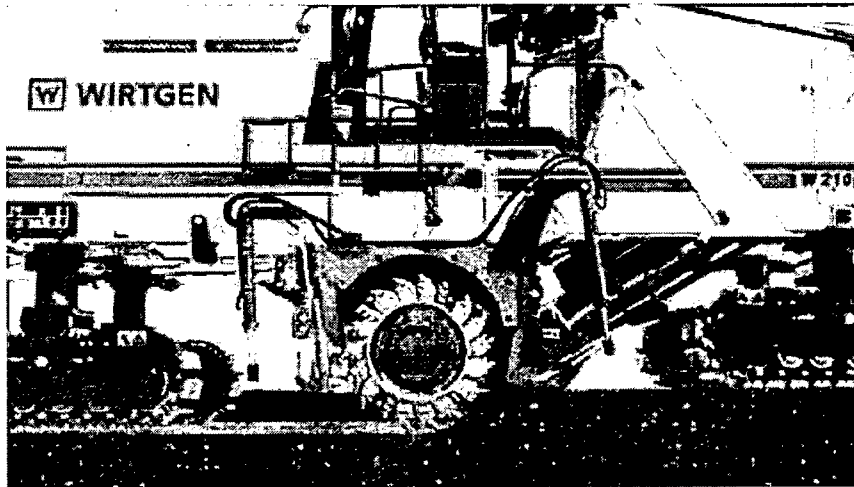


Road milling machines are also referred to as cold planers. Road milling machines have a rotating milling drum (also referred to as a rotor) that removes or “mills” existing pavement.

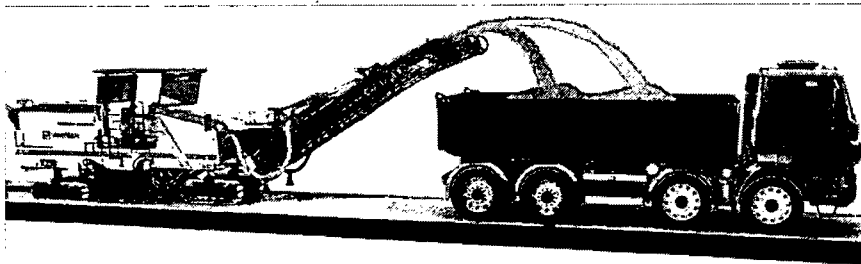
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As the drum rotates, spike-like cutting tools (also referred to as bits) on the drum grind the pavement into millings. The drum is enclosed in a housing (also referred to as a casing or chamber) that contains these millings.



Within the housing, the millings are directed toward a conveyor that deposits the millings into a nearby truck.



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Height-adjustable legs elevate the milling machine's body above the ground surface. The legs are connected to propulsion units that move the machine forward and backwards.

The '340 patent is directed to the scraper (also referred to as the rear door or drum flap) that forms the rear of the housing enclosing the milling drum. The '628 patent is directed to an auxiliary drive for rotating the milling drum. The '641 patent is directed to traveling backwards while the engine rotates the milling drum. And the '530 and '309 patents are directed to the height-adjustable legs.

JX-0018 at 2-3.

II. Jurisdiction and Standing

A. Personal and Subject Matter Jurisdiction

No party has contested the Commission's personal or subject matter jurisdiction in this investigation. *See* Wirtgen Br. at 16; Caterpillar Br. at 10 ("Caterpillar does not contest the subject matter jurisdiction or personal jurisdiction of the Commission to adjudicate this Investigation.").

Wirtgen has filed a complaint alleging a violation of section 337, and the Commission, therefore, has subject matter jurisdiction. *See Amgen, Inc. v. United States Int'l Trade Comm'n*, 902 F.2d 1532, 1535-37 (Fed. Cir. 1990).

In addition, Wirtgen and Caterpillar have appeared and participated in the investigation. The Commission, therefore, has personal jurisdiction over the parties. *See, e.g., Certain Liquid Crystal Display Modules, Products Containing Same, and Methods for Using the Same*, Inv. No. 337-TA-634, Final Initial and Recommended Determinations at 3 (June 12, 2009) (relevant part adopted by Commission Opinion issued July 22, 2011).³

³ The Commission "adopt[ed] all of the ALJ's findings and conclusions that are not inconsistent with [its] opinion." Comm'n Op. at 35.

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B. *In Rem* Jurisdiction

The Commission has *in rem* jurisdiction when infringing articles are imported, sold for importation, or sold within the United States after importation by the owner, importer, or consignee. 19 U.S.C. § 1337(a)(1)(B). “All that is required for *in rem* jurisdiction to be established is the presence of the imported property in the United States.” *Certain Male Prophylactic Devices*, Inv. No. 337-TA-546, Initial Determination (June 30, 2006) (citing *Certain Steel Rod Treating Apparatus and Components Thereof*, Inv. No. 337-TA-97, USITC Pub. No. 1210 (Jan. 1982), Commission Opinion at 4, 11 for the proposition that presence of *res* establishes *in rem* jurisdiction in Section 337 actions).

As discussed below, there is no dispute that the accused products—excluding the 2018 Product Updates—are manufactured abroad and imported into the United States. The Commission does not have jurisdiction over the 2018 Product Updates because Caterpillar has not imported machines including the updates into the United States. Accordingly, the administrative law judge has determined that the Commission has *in rem* jurisdiction over the accused products, but not machines that include the 2018 Product Updates.

C. The Importation Requirement

Section 337 of the Tariff Act makes unlawful, in certain circumstances, the “importation into the United States, the sale for importation, or the sale within the United States after importation by the owner, importer, or consignee, of articles” that infringe a U.S. patent. 19 U.S.C. § 1337(a)(1)(B). Prior decisions have referred to subsection (a)(1)(B) of the statute as the “Importation Requirement.” *Accord Certain Products Containing Interactive Program Guide and Parental Control Technology*, Inv. No. 337-TA-845, Comm’n Op. at 1 (Dec. 11, 2013); *Certain Toner Cartridges & Components Thereof*, Inv. No. 337-TA-918, Notice of

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Determination Not to Review Two Initial Determinations; One Regarding the Importation Requirement; and the Other Regarding the Economic Prong of the Domestic Industry Requirement (Feb. 18, 2015) (EDIS Doc. ID No. 551684, 2015 WL 13662634).

1. PM312, PM620, PM622, PM820, PM822, and PM825

a) Caterpillar Paving

Order No. 23 (Initial Determination) determined that Caterpillar Paving has imported into the United States the following products:

- 1) At least one PM312 cold planer;
- 2) At least one PM620 cold planer;
- 3) At least one PM622 cold planer;
- 4) At least one PM820 cold planer;
- 5) At least one PM822 cold planer; and
- 6) At least one PM825 cold planer.

See Order No. 23 at 14-15. Caterpillar did not seek review of Order No. 23, and the Commission did not review Order No. 23. Accordingly, Wirtgen has shown that Caterpillar Paving has met the importation requirement.

b) Caterpillar Prodotti

Order No. 23 determined that Caterpillar Prodotti has sold for importation into the United States:

- 1) At least one PM312 cold planer;
- 2) At least one PM620 cold planer;
- 3) At least one PM622 cold planer;
- 4) At least one PM820 cold planer;
- 5) At least one PM822 cold planer; and

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- 6) At least one PM825 cold planer.

Order No. 23 at 15. Order No. 23 further determined that Caterpillar Prodotti has offered to sell, for importation into the United States, the following:

- 1) At least one PM620 cold planer;
- 2) At least one PM622 cold planer;
- 3) At least one PM820 cold planer;
- 4) At least one PM822 cold planer; and
- 5) At least one PM825 cold planer.

Id. Caterpillar did not seek review of Order No. 23, and the Commission did not review Order No. 23. Accordingly, Wirtgen has shown that Caterpillar Prodotti has met the importation requirement.

c) Caterpillar Inc.

Order No. 23 determined that “that the importation requirement has been met with respect to Caterpillar Inc. in relation to the PM 620, PM 622, PM 820, PM 822 and PM825 cold planers.” Order No. 23 at 18. Order No. 23 also determined that Wirtgen had not shown as a matter of law, that Caterpillar has sold these cold planers after importation. *Id.* Neither Wirtgen nor Caterpillar sought review of Order No. 23, and the Commission did not review Order No. 23.⁴ Accordingly, Wirtgen has shown that Caterpillar Inc. has met the importation requirement with respect to the PM620, PM622, PM820, PM822, and PM825 models.

⁴ Wirtgen’s brief does not cite any evidence pertaining to sales specific to Caterpillar Inc. *See* Wirtgen Br. at 16-20. Similarly, Caterpillar’s brief does not address Caterpillar Inc.’s role in importing or selling the accused products. *See* Caterpillar Br. at 10-11.

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2. PM310 and PM313

Wirtgen argues that Caterpillar Paving has imported a PM310 machine after Caterpillar Paving purchased the machine from Caterpillar Prodotti. Wirtgen Br. at 17. Wirtgen also argues that Caterpillar Prodotti sold for importation a PM313 machine, which Caterpillar Paving imported. *Id.*

Caterpillar argues, in part, that:

First, Caterpillar does not contest that some products accused of infringement have been imported into the United States. But the evidence demonstrates that Respondent Caterpillar Prodotti does not import, and has not imported, the PM310 and PM312 cold planers. Similarly, the evidence shows that Caterpillar Americas C.V. does not import the Accused Products. Rather, the undisputed evidence shows that Caterpillar Americas C.V. is merely a marketing entity for Central and South America which facilitates transactions in those regions—it does not import Accused Products into the United States. JX-0021C (Bloomfield Dep. Tr.) at 86:21-13.

Caterpillar Br. at 11.

In reply, Caterpillar adds:

Wirtgen has failed to show that each Respondent imported and sold for importation all of the Accused Products. For example, Wirtgen relies on a single response on cross-examination from the Global Product Manager of Caterpillar Paving to prove importation of the PM310 and PM312. But this is not sufficient. The questions generically asked whether Mr. Clark contested “that the PM300, 600, and 800 series have been imported into the United States.” Wirtgen PostHBr. at 17. There is nothing in this statement that proves that a PM310 or PM313 have been imported or sold.

Caterpillar Reply at 2.

Having considered the parties’ arguments, the administrative law judge has determined that the importation requirement has been satisfied for the PM310 and PM313 machines with respect to Caterpillar Prodotti. On cross-examination, Mr. Paul Clark, the worldwide product manager for Caterpillar Paving, testified as follows:

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Q [] ?

A

Q [] ?

A

Q [] ?

A

Q [] ?

A

Q [] ?

A

Q [] ?

A

Q There's no dispute on that?

A No.

Q With regard to the PM312, there was even one that was shown in CONEXPO in 2017. Do you remember that?

A Yes.

Q [] ?

A [] .

Clark Tr. 615; *see also* RX-1171C (Clark RWS) at Q/A 4. Mr. Clark's testimony at the hearing was clear, he did not qualify his answer on this point, and Caterpillar has not pointed to any relevant redirect testimony. Further, CX-0344C shows that Caterpillar Prodotti [

] from [] to [] ,

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] Likewise, CX-0347C shows that Caterpillar Prodotti [] from [] to [] (Caterpillar Training Centre was the consignee). Accordingly, the evidence shows that Caterpillar Prodotti has imported the PM310 and PM313 machines. *See* Clark Tr. 615; CX-0344C; CX-0347C. The evidence cited does not show, however, that Caterpillar Paving imported the PM310 and PM313 machines, sold the PM310 and PM313 machines for importation, or sold the PM310 and PM313 machines after importation.

3. Caterpillar Americas CV

Wirtgen argues:

Similarly, undisputed evidence shows that Caterpillar Americas CV imported at least one PM620 Series machine. Compl., Ex. 26 (Caterpillar Americas CV Import Records). The importation requirement is therefore met for Respondent Caterpillar Americas CV for the PM620, and for Caterpillar Prodotti and Caterpillar Paving for the PM310 and PM312 machines.

Wirtgen Br. at 17.

Caterpillar replies:

Wirtgen claims “undisputed evidence” shows that Caterpillar Americas C.V. imported at least one PM620 machine, Wirtgen PostHBr. at 17, but relies on an unverified, third-party document that was not admitted into evidence, and has no sponsoring witness or explanation. The actual evidence established that Caterpillar Americas C.V. has no role in the importation or sale of Accused Products in the United States. *See* JX-0021C (Bloomfield Dep. Tr.) at 86:21-87:13.

Caterpillar Reply at 2.

The administrative law judge has determined that Wirtgen has not shown, by a preponderance of the evidence, that Caterpillar Americas CV has imported a PM620 machine.

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In particular, Wirtgen does not cite to any evidence of record to support its allegations.⁵

Accordingly, the administrative law judge has determined that Wirtgen has not shown that Caterpillar Americas CV imported a PM620 machine, as Wirtgen alleges, and thus concludes that Caterpillar Americas CV has not met the importation requirement.

4. 2018 Product Updates

Caterpillar argues that “Wirtgen America has failed to prove that . . . the 2018 Product Updates are not imported[.]” Caterpillar Br. at 10-11.⁶ In particular, Caterpillar argues:

Respondent Caterpillar Prodotti sold for importation, and Caterpillar Paving imported, a PM622 machine from Italy to the United States modified to include the 2018 Product Updates. This machine, inspected by Complainant’s experts and counsel in the U.S., was manufactured in Italy. Certain features were modified after importation, but the machine itself was made in Italy of domestic and foreign components, and thus is imported. Thus, this machine satisfies the importation requirement.

Id. at 11.

Wirtgen argues that the 2018 Product Updates are hypothetical and have not been finalized. *See* Wirtgen Br. at 18-19 (citing Engelmann Tr. 724-725). Wirtgen also argues that Caterpillar has not imported machines that include the 2018 Product Updates. *Id.* at 19-20. Caterpillar’s entire reply is:

Wirtgen argues that the 2018 Product Update Machines are “hypothetical product[s]” not ripe for a decision. Wirtgen PostHBr. at 17-20. However, the evidence shows that these designs are far from hypothetical. Caterpillar provided ample discovery on the 2018 Product Update Machines and has proven that they do not infringe. It was Wirtgen that failed to substantively address whether the 2018 Product Update Machines infringed.

⁵ Exhibit 26 to the Complaint appears to be a report from Import Genius. Wirtgen has not demonstrated that the exhibit was accepted into the record.

⁶ Caterpillar has not explained why Wirtgen has the burden of showing that Caterpillar’s products “are not imported.”

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The 2018 Product Update Machines are sufficiently final for the ALJ to make a recommended determination. *See, e.g., Certain Multiple Mode Outdoor Grills and Parts Thereof*, Inv. No. 337-TA-895, Comm'n Op. at 15 (Jul. 23, 2014) (finding sufficient discovery to place redesigned products at issue); *Certain Electronic Digital Media Devices and Components Thereof*, Inv. No. 337-TA-796, Comm'n Op. at 105 (Sept. 6, 2013) (same). Wirtgen tries to cast doubt on the timeline for when the 2018 Product Update Machines "might be ready to implement." Wirtgen PostHBr. at 19. However, the evidence shows that the designs are final. *See* Tr. (Engelmann) at 756:20-757:7; JX-0028C (Lindholm Dep. Tr.) at 68:3-4 ("[T]hose designs are done so they're not being worked on anymore, but they're ready to be released.").

Wirtgen also raises questions about the import status of the 2018 Product Update Machines. However, as the Commission has consistently held, questions about the importation status of redesigned products do "not offer an appropriate basis for the ALJ to decline to make a determination of infringement." *Flash Memory Circuits and Products Containing Same* Inv. No. 337-TA-382, Comm'n Op. at 19 (June 9, 1997); *see also Multiple Mode Outdoor Grills*, Comm'n Op. at 20 (rejecting an argument against summary determination of noninfringement based on importation status). Here, the issue of infringement of the 2018 Product Update Machines is ripe for determination in this Investigation.

Caterpillar Reply at 3.

Wirtgen argues that the Commission lacks jurisdiction over the 2018 Product Updates.

Wirtgen Reply at 6-8. Wirtgen argues that for the PM622 machine, Caterpillar imported an ordinary PM622 machine and then "refitted that PM622 in the United States with a redesigned rear door that it alleges does not infringe." *Id.* at 6. Wirtgen adds:

That Caterpillar produced discovery [] and Wirtgen America conducted an inspection of the alleged prototype does not confer jurisdiction on the Commission to adjudicate infringement. *See* Cat. PH Br. at 8. Indeed, discovery revealed that the [] was not finalized at the time of the inspection, the inspected prototype was modified in the United States following importation, and that no product had ever been imported with the alleged redesign at the time of importation. Hearing Tr. 723:23-725:3; JX-0024C (Engelmann Dep. Tr.) 159:4-10.

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Id. at 7.

Having considered the parties' arguments, the administrative law judge has determined that the Commission does not have jurisdiction over the 2018 product updates and that the 2018 Product Updates are not sufficiently fixed (*e.g.*, finalized) for adjudication. Caterpillar's brief and reply cite solely to its employees' testimony. *See* Caterpillar Br. at 10-11; Caterpillar Reply at 3. The testimony that Caterpillar cites shows that [] and its designs are just []. Engelmann Tr. 756. Caterpillar's employee, however, acknowledged that []:

Q Can you just explain to the Court the process of how design changes are made from the time that you begin the engineering process to the time they actually roll off the assembly line?

A Sure. So within my team, the engineering team, we -- we develop [] and do the analysis that's necessary [], at which time we work to create [], that is the []. And once that []

[]. Our change coordinators [] and then they are fully [], at which time that starts to [].

Engelmann Tr. 756. Caterpillar does not cite to any documents showing that a machine including the 2018 Product Updates has been imported. *Id.* Similarly, Caterpillar does not cite to any documents showing that the 2018 Product Updates have been sufficiently fixed (or finalized) in Caterpillar's product offerings. *Id.*

The testimony Wirtgen cites shows that the 2018 Product Updates []

[], and that there is no []

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J. Engelmann Tr. 723-727. Caterpillar's witness also acknowledged that the "updated" PM622 was [

J. *Id.* at 723 (the["

J.").

Accordingly, the administrative law judge has determined that the 2018 Product Updates are not sufficiently final for adjudication and that machines including the 2018 Product Updates do not satisfy the importation requirement.

D. Standing

Caterpillar argues that "Wirtgen America has failed to prove that . . . it had standing to bring this Investigation." Caterpillar Br. at 10-11. Caterpillar argues that Wirtgen "had no rights whatsoever to any of the Asserted Patents two months before the Complaint was filed" and that "Wirtgen America does not have the full right to 'make, use, and sell' products under the Asserted Patents" because Wirtgen America is required to purchase products and parts covered by the patents from Wirtgen GmbH. Caterpillar argues, in part, that:

Wirtgen GmbH's retention of these rights shows that it is a necessary party in this suit, and that Wirtgen America alone does not have standing. Federal Circuit precedent holds that the "limited right to make, use, and sell products embodying the patented inventions" is among the rights "that are commonly held sufficient to make an owner . . . a necessary party." *Abbott Labs. v. Ortho Diagnostic Systems, Inc.*, 47 F.3d 1128, 1132-33 (Fed. Cir. 1995). Similarly, a "licensor's retention of a limited right to develop and market the patented invention indicates that the licensee failed to acquire all substantial rights." *Fieldturf, Inc. v. Sw. Recreational Indus.*, 357 F.3d 1266, 1269 (Fed. Cir. 2004). Here, Wirtgen GmbH has retained a significant interest—the exclusive right to supply the "assignee" with products covered by the patents. Thus, Wirtgen GmbH is a necessary party in the Investigation, and Wirtgen America cannot sue alone.

. . . Wirtgen America cannot manufacture its own products under the patents, purchase covered products from another entity, or even use

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or sell covered products, unless those products and components are purchased from Wirtgen GmbH. JX-0011.0009; Tr. (McEvoy) at 100:18-101:5.

It is true that the “eleventh hour” agreement regarding the Asserted Patents, along with the fact that Wirtgen America sued in its own name alone, made discovery in this Investigation less burdensome on Wirtgen GmbH. Indeed, Wirtgen America successfully blocked Caterpillar from obtaining significant discovery from Wirtgen GmbH. *See* Order 17 (Jan. 16, 2017) (granting in-part Caterpillar’s motion to compel discovery from Wirtgen GmbH). But this strategic decision dooms Wirtgen America on standing. Wirtgen America, lacking the most basic rights to make, use, and sell Wirtgen GmbH products, lacks all substantial rights in the Asserted Patents, and therefore lacks standing to sue in its own name alone. Accordingly, the ITC lacks jurisdiction over this Investigation, and the Investigation must be terminated.

Id. at 13-14 (introductory argument and citation to *Alfred E. Mann Found. v. Cochlear Corp.*, 604 F.3d. 1354, 1360 (Fed. Cir. 2010) omitted).

Wirtgen America replies that Caterpillar’s post-hearing brief raises a “new standing argument” that “relies on information known to Caterpillar since the beginning of fact discovery.” Wirtgen Reply at 4. As to the merits, Wirtgen America argues:

The agreement to which Caterpillar points grants Wirtgen America full title and interest in the patents, including the sole right to enforce the patents and exclude all others from making using, selling, and importing the products. *See e.g.*, JX-0011.0008 (‘340 Assignment). In exchange, Wirtgen America promised that Wirtgen GmbH would be its sole supplier of “component products that Wirtgen America can use in the manufacture, import, use and/or sale of products covered by the Assigned Patents.” *Id.* Wirtgen GmbH manufactures the products overseas and retained no rights under the patents.

Id. at 5. Wirtgen America also argues that its exclusive-supplier relationship with Wirtgen GmbH does not impair its standing. *Id.* (“becoming an exclusive supplier of patented products to the patentee does not confer to the supplier any rights under a patent”). Wirtgen America also argues that Wirtgen GmbH “possesses no right to the Asserted Patents.” Finally, Wirtgen

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America argues that the cases Caterpillar cite address just “the issue of whether a licensee holds sufficient rights to bring suit without joining the patent owner as a necessary party.” *Id.*

(emphasis in original).

In *Fieldturf v. Southwest Recreational Industries*, the Federal Circuit explained:

To bring an action for patent infringement, a party must be either the patentee, a successor in title to the patentee, or an exclusive licensee of the patent at issue. *Mentor H/S, Inc. v. Med. Device Alliance, Inc.*, 240 F.3d 1016, 1017 (Fed.Cir.2001) (citing 35 U.S.C. §§ 100, 281 and *Textile Prods., Inc. v. Mead Corp.*, 134 F.3d 1481, 1483 (Fed.Cir.1998)). A purported exclusive licensee must show that he possesses “‘all substantial rights’ in the patent.” *Id.* (citing *Textile Prods.*, 134 F.3d at 1484). Lacking all substantial rights, he may bring suit against “third parties only as a co-plaintiff with the patentee” or a successor in title to the patentee. *Id.* (citing *Textile Prods.*, 134 F.3d at 1484). Otherwise, he lacks standing. *Id.*

Fieldturf, Inc. v. Sw. Recreational Indus., Inc., 357 F.3d 1266, 1268 (Fed. Cir. 2004).

Having considered the parties’ arguments, the administrative law judge has determined that Wirtgen America has standing in this investigation. The assignments for the asserted patents contain the following language:

In consideration of the payment of one (\$1.00) dollar . . . Wirtgen GmbH . . . assigns to Wirtgen America, Inc. . . . ***its entire right, title, and interest in and to*** [the Assigned Patents].

This Assignment includes without limitation, the right to sue for past, present and future infringement of the Assigned Patent and the right to collect and receive any damages, royalties or settlement for such past, present and future infringements and any and all causes of action relating to any of the Assigned Patents described herein. This Assignment supersedes and replaces all other past agreements between the Assignor and Assignee with respect to the Assigned Patents.

In consideration for this Assignment, Assignee is obliged to purchase all component products that Assignee can use in the manufacture, import, use and/or sale of products covered by the Assigned Patents from Assignor, and to enforce the rights under the Assigned Patents.

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JX-0011 at 8-9 ('340 Patent) (emphasis added); *see also* JX-0013 at 8-9 ('530 Patent); JX-0014 at 8-9 ('641 Patent); JX-0015 at 8-9 ('309 Patent). Thus, the evidence shows that Wirtgen America obtained all rights to the asserted patents, including the exclusive rights articulated in 35 U.S.C. § 271 as well as the right to sue others for infringing claims of the patents. *See Fieldturf*, 357 F.3d at 1269 (citing *State Contracting & Eng'g Corp. v. Condotte Am., Inc.*, 346 F.3d 1057, 1062 (Fed. Cir. 2003) for the proposition that “the failure to transfer the right to sue infringers distinguishes a license from an assignment, and the former ‘generally affords the licensee no right to sue for infringement’”). Although Caterpillar argues that “Wirtgen America does not have the full right to ‘make, use, and sell’ products under the Asserted Patents and is merely Wirtgen GmbH’s sales agent in the U.S. for products made in Germany by Wirtgen GmbH[,]” Caterpillar’s brief does not explain where the agreement permits Wirtgen GmbH to sell products that practice the asserted patents. *See, e.g.*, JX-0011 at 8-9. Similarly, the technical prong evidence (discussed *infra*) also shows that Wirtgen GmbH makes products that practice the asserted patents in the United States. *See Fieldturf*, 357 F.3d at 1269 (citing *Abbott Labs. v. Diamedix Corp.*, 47 F.3d 1128, 1132 (Fed. Cir. 1995) for the proposition that the “retention of a limited right to develop and market the patented invention indicates that the licensee [or assignee] failed to acquire all substantial rights”). Accordingly, the administrative law judge has determined that Wirtgen America obtained all substantial rights to the asserted patents and that Wirtgen America has standing in this investigation.⁷

⁷ The administrative law judge notes that Caterpillar’s pre-hearing brief does not present any standing arguments. *See* Caterpillar Pre-Hr’g Br. at 12-13 (addressing jurisdiction and importation), 282 (discussing “rights to the Asserted Patents” in the domestic-industry context). Caterpillar’s assertion that it “became clear at the hearing that the sole complainant . . . lacks standing” is a red herring, as Caterpillar had access to the assignment documents and could have developed this theory during discovery if it desired, because the assignments are public exhibits to the Complaint. *See, e.g.*, Compl., Exs. 7, 13, 16, and 19. Caterpillar does not explain why it

III. General Principles of Law

A. Claim Construction

Claim construction begins with the plain language of the claim.⁸ Claims should be given their ordinary and customary meaning as understood by a person of ordinary skill in the art, viewing the claim terms in the context of the entire patent.⁹ *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (en banc), *cert. denied*, 546 U.S. 1170 (2006).

In some instances, claim terms do not have particular meaning in a field of art, and claim construction involves little more than the application of the widely accepted meaning of commonly understood words. *Phillips*, 415 F.3d at 1314. “In such circumstances, general purpose dictionaries may be helpful.” *Id.*

In many cases, claim terms have a specialized meaning, and it is necessary to determine what a person of skill in the art would have understood the disputed claim language to mean. “Because the meaning of a claim term as understood by persons of skill in the art is often not immediately apparent, and because patentees frequently use terms idiosyncratically, the court looks to ‘those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean.’” *Phillips*, 415 F.3d at 1314 (quoting

was not aware (or could not have been aware) of the standing argument with reasonable diligence.

⁸ Only those claim terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Vanderlande Indus. Nederland BV v. Int’l Trade Comm.*, 366 F.3d 1311, 1323 (Fed. Cir. 2004); *Vivid Tech., Inc. v. American Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

⁹ Factors that may be considered when determining the level of ordinary skill in the art include: “(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field.” *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696 (Fed. Cir. 1983), *cert. denied*, 464 U.S. 1043 (1984).

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Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc., 381 F.3d 1111, 1116 (Fed. Cir. 2004)). The public sources identified in *Phillips* include “the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.” *Id.* (quoting *Innova*, 381 F.3d at 1116).

In cases in which the meaning of a claim term is uncertain, the specification usually is the best guide to the meaning of the term. *Phillips*, 415 F.3d at 1315. As a general rule, the particular examples or embodiments discussed in the specification are not to be read into the claims as limitations. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996). The specification is, however, always highly relevant to the claim construction analysis, and is usually dispositive. *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). Moreover, “[t]he construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.” *Id.* at 1316.

Claims are not necessarily, and are not usually, limited in scope to the preferred embodiment. *RF Delaware, Inc. v. Pacific Keystone Techs., Inc.*, 326 F.3d 1255, 1263 (Fed. Cir. 2003); *Decisioning.com, Inc. v. Federated Dep’t Stores, Inc.*, 527 F.3d 1300, 1314 (Fed. Cir. 2008) (“[The] description of a preferred embodiment, in the absence of a clear intention to limit claim scope, is an insufficient basis on which to narrow the claims.”). Nevertheless, claim constructions that exclude the preferred embodiment are “rarely, if ever, correct and require highly persuasive evidentiary support.” *Vitronics*, 90 F.3d at 1583. Such a conclusion can be mandated in rare instances by clear intrinsic evidence, such as unambiguous claim language or a clear disclaimer by the patentees during patent prosecution. *Elektá Instrument S.A. v. O.U.R. Sci.*

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Int'l, Inc., 214 F.3d 1302, 1308 (Fed. Cir. 2000); *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319 (Fed. Cir. 2002).

If the intrinsic evidence does not establish the meaning of a claim, then extrinsic evidence may be considered. Extrinsic evidence consists of all evidence external to the patent and the prosecution history, and includes inventor testimony, expert testimony, and learned treatises. *Phillips*, 415 F.3d at 1317. Inventor testimony can be useful to shed light on the relevant art. In evaluating expert testimony, a court should discount any expert testimony that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words, with the written record of the patent. *Id.* at 1318. Extrinsic evidence may be considered if a court deems it helpful in determining the true meaning of language used in the patent claims. *Id.*

B. Infringement

1. Direct Infringement

Under 35 U.S.C. § 271(a), direct infringement consists of making, using, offering to sell, or selling a patented invention without consent of the patent owner. The complainant in a section 337 investigation bears the burden of proving infringement of the asserted patent claims by a “preponderance of the evidence.” *Certain Flooring Products*, Inv. No. 337-TA-443, Comm’n Notice of Final Determination of No Violation of Section 337, 2002 WL 448690, at *59, (Mar. 22, 2002); *Enercon GmbH v. Int’l Trade Comm’n*, 151 F.3d 1376 (Fed. Cir. 1998). Literal infringement of a claim occurs when every limitation recited in the claim appears in the accused device, *i.e.*, when the properly construed claim reads on the accused device exactly.¹⁰

¹⁰ Each patent claim element or limitation is considered material and essential. *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538 (Fed. Cir. 1991). If an accused device lacks a

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Amhil Enters., Ltd. v. Wawa, Inc., 81 F.3d 1554, 1562 (Fed. Cir. 1996); *Southwall Tech. v. Cardinal IG Co.*, 54 F.3d 1570, 1575 (Fed Cir. 1995).

If the accused product does not literally infringe the patent claim, infringement might be found under the doctrine of equivalents. “Under this doctrine, a product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is ‘equivalence’ between the elements of the accused product or process and the claimed elements of the patented invention.” *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 21 (1997) (citing *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 609 (1950)). “The determination of equivalence should be applied as an objective inquiry on an element by element basis.”¹¹ *Id.* at 40.

“An element in the accused product is equivalent to a claim limitation if the differences between the two are insubstantial. The analysis focuses on whether the element in the accused device ‘performs substantially the same function in substantially the same way to obtain the same result’ as the claim limitation.” *AquaTex Indus. v. Techniche Solutions*, 419 F.3d 1374, 1382 (Fed. Cir. 2005) (quoting *Graver Tank*, 339 U.S. at 608); accord *Absolute Software*, 659 F.3d at 1139-40.¹²

limitation of an independent claim, the device cannot infringe a dependent claim. See *Wahpeton Canvas Co. v. Frontier, Inc.*, 870 F.2d 1546, 1552 n.9 (Fed. Cir. 1989).

¹¹ “Infringement, whether literal or under the doctrine of equivalents, is a question of fact.” *Absolute Software, Inc. v. Stealth Signal, Inc.*, 659 F.3d 1121, 1130 (Fed. Cir. 2011).

¹² “The known interchangeability of substitutes for an element of a patent is one of the express objective factors noted by *Graver Tank* as bearing upon whether the accused device is substantially the same as the patented invention. Independent experimentation by the alleged infringer would not always reflect upon the objective question whether a person skilled in the art would have known of the interchangeability between two elements, but in many cases it would likely be probative of such knowledge.” *Warner Jenkinson*, 520 U.S. at 36.

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Prosecution history estoppel can prevent a patentee from relying on the doctrine of equivalents when the patentee relinquished subject matter during the prosecution of the patent, either by amendment or argument. *AquaTex*, 419 F.3d at 1382. In particular, “[t]he doctrine of prosecution history estoppel limits the doctrine of equivalents when an applicant makes a narrowing amendment for purposes of patentability, or clearly and unmistakably surrenders subject matter by arguments made to an examiner.” *Id.* (quoting *Salazar v. Procter & Gamble Co.*, 414 F.3d 1342, 1344 (Fed. Cir. 2005)).

2. Indirect Infringement

a) Induced Infringement

Section 271(b) of the Patent Act provides: “Whoever actively induces infringement of a patent shall be liable as an infringer.” 35 U.S.C. § 271(b).

“To prevail on a claim of induced infringement, in addition to inducement by the defendant, the patentee must also show that the asserted patent was directly infringed.” *Epcon Gas Sys. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 1033 (Fed. Cir. 2002). Further, “[s]ection 271(b) covers active inducement of infringement, which typically includes acts that intentionally cause, urge, encourage, or aid another to directly infringe a patent.” *Arris Group v. British Telecomm. PLC*, 639 F.3d 1368, 1379 n.13 (Fed. Cir. 2011). The Supreme Court held that “induced infringement under § 271(b) requires knowledge that the induced acts constitute patent infringement.” *Global-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754, 766 (2011). The Court further held: “[g]iven the long history of willful blindness¹³ and its wide acceptance in the

¹³ “While the Courts of Appeals articulate the doctrine of willful blindness in slightly different ways, all appear to agree on two basic requirements: (1) the defendant must subjectively believe that there is a high probability that a fact exists and (2) the defendant must take deliberate actions to avoid learning of that fact. We think these requirements give willful blindness an

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Federal Judiciary, we can see no reason why the doctrine should not apply in civil lawsuits for induced patent infringement under 35 U.S.C. § 271(b).” *Id.* at 768 (footnote omitted).

b) Contributory Infringement

Section 271(c) of the Patent Act provides: “Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer.” 35 U.S.C. § 271(c).

Section 271(c) “covers both contributory infringement of system claims and method claims.”¹⁴ *Arris*, 639 F.3d at 1376 (footnotes omitted). To hold a component supplier liable for contributory infringement, a patent holder must show, inter alia, that (a) the supplier’s product was used to commit acts of direct infringement; (b) the product’s use constituted a material part of the invention; (c) the supplier knew its product was especially made or especially adapted for use in an infringement” of the patent; and (d) the product is not a staple article or commodity of commerce suitable for substantial noninfringing use. *Id.*

appropriately limited scope that surpasses recklessness and negligence.” *Global-Tech*, 563 U.S. at 769.

¹⁴ “Claims which recite a ‘system,’ ‘apparatus,’ ‘combination,’ or the like are all analytically similar in the sense that their claim limitations include elements rather than method steps. All such claims can be contributorily infringed by a component supplier.” *Arris*, 639 F.3d at 1376 n.8.

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C. Validity

One cannot be held liable for practicing an invalid patent claim. *See Pandrol USA, LP v. AirBoss Railway Prods., Inc.*, 320 F.3d 1354, 1365 (Fed. Cir. 2003). Nevertheless, each claim of a patent is presumed to be valid, even if it depends from a claim found to be invalid. 35 U.S.C. § 282; *DMI Inc. v. Deere & Co.*, 802 F.2d 421 (Fed. Cir. 1986).

A respondent that has raised patent invalidity as an affirmative defense must overcome the presumption by “clear and convincing” evidence of invalidity. *Checkpoint Systems, Inc. v. United States Int’l Trade Comm’n*, 54 F.3d 756, 761 (Fed. Cir. 1995).

1. Anticipation

Anticipation under 35 U.S.C. § 102 is a question of fact. *z4 Techs., Inc. v. Microsoft Corp.*, 507 F.3d 1340, 1347 (Fed. Cir. 2007). Section 102 provides that, depending on the circumstances, a claimed invention may be anticipated by variety of prior art, including publications, earlier-sold products, and patents. *See* 35 U.S.C. § 102 (*e.g.*, section 102(b) provides that one is not entitled to a patent if the claimed invention “was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States”).

The general law of anticipation may be summarized, as follows:

A reference is anticipatory under § 102(b) when it satisfies particular requirements. First, the reference must disclose each and every element of the claimed invention, whether it does so explicitly or inherently. *Eli Lilly & Co. v. Zenith Goldline Pharms., Inc.*, 471 F.3d 1369, 1375 (Fed. Cir. 2006). While those elements must be “arranged or combined in the same way as in the claim,” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1370 (Fed. Cir. 2008), the reference need not satisfy an *ipsissimis verbis* test, *In re Bond*, 910 F.2d 831, 832 33 (Fed. Cir. 1990). Second, the reference must “enable one of ordinary skill in the art to make the invention without undue experimentation.” *Impax Labs., Inc. v. Aventis Pharms. Inc.*, 545 F.3d 1312, 1314 (Fed. Cir. 2008); *see In re*

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LeGrice, 49 C.C.P.A. 1124, 301 F.2d 929, 940-44 (1962). As long as the reference discloses all of the claim limitations and enables the “subject matter that falls within the scope of the claims at issue,” the reference anticipates -- no “actual creation or reduction to practice” is required. *Schering Corp. v. Geneva Pharms., Inc.*, 339 F.3d 1373, 1380-81 (Fed. Cir. 2003); see *In re Donohue*, 766 F.2d 531, 533 (Fed. Cir. 1985). This is so despite the fact that the description provided in the anticipating reference might not otherwise entitle its author to a patent. See *Vas Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1562 (Fed. Cir. 1991) (discussing the “distinction between a written description adequate to support a claim under § 112 and a written description sufficient to anticipate its subject matter under § 102(b)”).

In re Gleave, 560 F.3d 1331, 1334 (Fed. Cir. 2009).

2. Obviousness

Under section 103 of the Patent Act, a patent claim is invalid “if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.”¹⁵ 35 U.S.C. § 103. While the ultimate determination of whether an invention would have been obvious is a legal conclusion, it is based on “underlying factual inquiries including: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness.” *Eli Lilly and Co. v. Teva Pharmaceuticals USA, Inc.*, 619 F.3d 1329 (Fed. Cir. 2010).

The objective evidence, also known as “secondary considerations,” includes commercial success, long felt need, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 13-17 (1966); *Dystar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (Fed. Cir. 2006).

¹⁵ The standard for determining whether a patent or publication is prior art under section 103 is the same as under 35 U.S.C. § 102, which is a legal question. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1568 (Fed. Cir. 1987).

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“[E]vidence arising out of the so-called ‘secondary considerations’ must always when present be considered en route to a determination of obviousness.” *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983). Secondary considerations, such as commercial success, will not always dislodge a determination of obviousness based on analysis of the prior art. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 426 (2007) (commercial success did not alter conclusion of obviousness).

“One of the ways in which a patent’s subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent’s claims.” *KSR*, 550 U.S. at 419-20. “[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.” *Id.*

Specific teachings, suggestions, or motivations to combine prior art may provide helpful insights into the state of the art at the time of the alleged invention. *Id.* at 420. Nevertheless, “an obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way.” *Id.* “Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.” *Id.* A “person of ordinary skill is also a person of ordinary creativity.” *Id.* at 421.

Nevertheless, “the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make the composition or device, or carry out the claimed process, and would have had a reasonable

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expectation of success in doing so.” *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007); *see KSR*, 550 U.S. at 416 (a combination of elements must do more than yield a predictable result; combining elements that work together in an “unexpected and fruitful manner” would not have been obvious).¹⁶

3. Written Description

The issue of whether a patent is invalid for failure to meet the written description requirement of 35 U.S.C. § 112, ¶ 1 is a question of fact. *Bard Peripheral Vascular, Inc. v. W.L. Gore & Assocs., Inc.*, 670 F.3d 1171, 1188 (Fed. Cir. 2012). A patent’s written description must clearly allow persons of ordinary skill in the art to recognize that the inventor invented what is claimed. The test for sufficiency of a written description is “whether the disclosure of the application relied upon reasonable conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Id.* (quoting *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc)).

4. Indefiniteness

The definiteness requirement of 35 U.S.C. § 112 ensures that the patent claims particularly point out and distinctly claim the subject matter that the patentee regards to be the invention. *See* 35 U.S.C. § 112, ¶ 2; *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1366 (Fed. Cir. 2004). If a claim’s legal scope is not clear enough so that a person of ordinary skill in the art could determine whether or not a particular product infringes, the claim is

¹⁶ Further, “when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious.” *KSR*, 550 U.S. at 416 (citing *United States v. Adams*, 383 U.S. 39, 52 (1966)).

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indefinite, and is, therefore, invalid. *Geneva Pharm., Inc. v. GlaxoSmithKline PLC*, 349 F.3d 1373, 1384 (Fed. Cir. 2003).¹⁷ Thus, it has been found that:

When a proposed construction requires that an artisan make a separate infringement determination for every set of circumstances in which the composition may be used, and when such determinations are likely to result in differing outcomes (sometimes infringing and sometimes not), that construction is likely to be indefinite.

Halliburton Energy Servs. v. M-I LLC, 514 F.3d 1244, 1255 (Fed. Cir. 2008).

The Supreme Court addressed the issue of indefiniteness, and stated that a finding of indefiniteness should not be found if the claims, “viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014) (“*Nautilus*”).

A patent is not indefinite if the claims, “viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty.” *Nautilus*, 134 S. Ct. at 2124. “If, after a review of the intrinsic and extrinsic evidence, a claim term remains ambiguous, the claim should be construed so as to maintain its validity.” *Certain Consumer Electronics And Display Devices With Graphics Processing And Graphics Processing Units Therein*, Inv. No. 337-TA-932, Order No. 20 (Apr. 2, 2015) (quoting *Phillips*, 415 F.3d at 1327).

The burden is on the accused infringer to come forward with clear and convincing evidence to prove invalidity. See *Young v. Lumenis, Inc.*, 492 F.3d 1336, 1344 (Fed. Cir. 2007)

¹⁷ Indefiniteness is a question of law. *IGT v. Bally Gaming Int’l, Inc.*, 659 F.3d 1109 (Fed. Cir. 2011).

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(“A determination that a patent claim is invalid for failing to meet the definiteness requirement in 35 U.S.C. § 112, ¶ 2 is a legal question reviewed de novo.”).

D. Domestic Industry

A violation of section 337(a)(1)(B), (C), (D), or (E) can be found “only if an industry in the United States, with respect to the articles protected by the patent, copyright, trademark, mask work, or design concerned, exists or is in the process of being established.” 19 U.S.C.

§ 1337(a)(2). Section 337(a) further provides:

(3) For purposes of paragraph (2), an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark, mask work, or design concerned—

(A) significant investment in plant and equipment;

(B) significant employment of labor or capital; or

(C) substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. § 1337(a)(3).

These statutory requirements consist of an economic prong (which requires certain activities)¹⁸ and a technical prong (which requires that these activities relate to the intellectual

¹⁸ The Commission practice is usually to assess the facts relating to the economic prong at the time that the complaint was filed. See *Certain Coaxial Cable Connectors and Components Thereof and Products Containing Same*, Inv. No. 337-TA-560, Comm’n Op. at 39 n.17 (Apr. 14, 2010) (“We note that only activities that occurred before the filing of a complaint with the Commission are relevant to whether a domestic industry exists or is in the process of being established under sections 337(a)(2)-(3).”) (citing *Bally/Midway Mfg. Co. v. U.S. Int’l Trade Comm’n*, 714 F.2d 1117, 1121 (Fed. Cir. 1983)). In some cases, however, the Commission will consider later developments in the alleged industry, such as “when a significant and unusual development occurred after the complaint has been filed.” See *Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, Comm’n Op., at 5-6 (Jan. 20, 2012) (“[I]n appropriate situations based on the specific facts and circumstances of an investigation, the Commission may consider activities and investments beyond the filing of the complaint.”).

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property being protected). *Certain Stringed Musical Instruments and Components Thereof*, Inv. No. 337-TA-586, Comm’n Op. at 13 (May 16, 2008) (“*Stringed Musical Instruments*”). The burden is on the complainant to show by a preponderance of the evidence that the domestic industry requirement is satisfied. *Certain Multimedia Display and Navigation Devices and Systems, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-694, Comm’n Op. at 5 (July 22, 2011) (“*Navigation Devices*”).

1. Economic Prong

With respect to the economic prong, and whether or not section 337(a)(3)(A) or (B) is satisfied, the Commission has held that “whether a complainant has established that its investment and/or employment activities are significant with respect to the articles protected by the intellectual property right concerned is not evaluated according to any rigid mathematical formula.” *Certain Printing and Imaging Devices and Components Thereof*, Inv. No. 337 TA 690, Comm’n Op. at 27 (Feb. 17, 2011) (“*Printing and Imaging Devices*”) (citing *Certain Male Prophylactic Devices*, Inv. No. 337 TA-546, Comm’n Op. at 39 (Aug. 1, 2007)). Rather, the Commission examines “the facts in each investigation, the article of commerce, and the realities of the marketplace.” *Id.* “The determination takes into account the nature of the investment and/or employment activities, ‘the industry in question, and the complainant’s relative size.’” *Id.* (citing *Stringed Musical Instruments* at 26).

With respect to section 337(a)(3)(C), whether an investment in domestic industry is “substantial” is a fact-dependent inquiry for which the complainant bears the burden of proof. *Stringed Musical Instruments* at 14. There is no minimum monetary expenditure that a complainant must demonstrate to qualify as a domestic industry under the “substantial investment” requirement of this section. *Id.* at 25. There is no need to define or quantify an

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industry in absolute mathematical terms. *Id.* at 26. Rather, “the requirement for showing the existence of a domestic industry will depend on the industry in question, and the complainant’s relative size.” *Id.* at 25-26.

2. Technical Prong

“With respect to section 337(a)(3)(A) and (B), the technical prong is the requirement that the investments in plant or equipment and employment in labor or capital are actually related to ‘articles protected by’ the intellectual property right which forms the basis of the complaint.” *Stringed Musical Instruments* at 13-14. “The test for satisfying the ‘technical prong’ of the industry requirement is essentially same as that for infringement, *i.e.*, a comparison of domestic products to the asserted claims.” *Alloc, Inc. v. Int’l Trade Comm’n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003). “With respect to section 337(a)(3)(C), the technical prong is the requirement that the activities of engineering, research and development, and licensing are actually related to the asserted intellectual property right.” *Stringed Musical Instruments* at 13.

IV. U.S. Patent No. 7,828,309

A. Overview of the ‘309 Patent (JX-0005)

The ‘309 Patent, entitled “Road-building machine,” issued on November 9, 2010. The application that would issue as the ‘309 Patent, Application No. 11/885,460, was filed on March 9, 2006, and claims priority to German Application No. 10 2005 011052.5, which was filed on March 10, 2005. The ‘309 Patent is directed to a four-way floating-axle that aims to improve the stability of road-building machines. *See generally* JX-0005 at Abstract; 2:13-16 (“The object on which the present invention is based is, therefore, to improve the stability of the road-building machines initially mentioned, as compared with the prior art mentioned.”).

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Wirtgen asserts claim 10 (which depends from claims 1 and 9), claim 29, and claim 36.

Wirtgen Br. at 202. Claims 1, 9, 10, 26, 29, 35 and 36 are reproduced below:

1. A road-building machine, of which a left front wheel or caterpillar, right front wheel or caterpillar, left rear wheel or caterpillar and right rear wheel or caterpillar is connected to a chassis of the road-building machine by means of an actuating member and is adjustable in height with respect to a frame of the road-building machine, the individual actuating members being connected rigidly to the chassis and being positively coupled to one another in such a way that the left front wheel or caterpillar and the right rear wheel or caterpillar can be adjusted in height in the same direction and in the opposite direction to the right front wheel or caterpillar and the left rear wheel or caterpillar, and the actuating members being designed as double-acting working cylinders with a first and a second working chamber which are filled with a pressure medium, the working cylinders being connected to one another via coupling lines.

* * *

9. The road-building machine as claimed in claim 1, characterized in that the coupling lines can be connected to a pressure medium source and/or a pressure medium sump via working lines with the aid of a valve control.

* * *

10. The road-building machine as claimed in claim 9, characterized in that the valve control is designed such that all the wheels are raised in a first operating mode and are lowered in a second operating mode, this taking place in each case by the same amount.

* * *

26. A road-building machine, comprising: a chassis having a forward direction; a left front wheel or caterpillar; a right front wheel or caterpillar; a left rear wheel or caterpillar; a right rear wheel or caterpillar; a first working cylinder rigidly connected to the chassis and connected to the left front wheel or caterpillar for adjusting a height of the left front wheel or caterpillar relative to the chassis; a second working cylinder rigidly connected to the chassis and connected to the right front wheel or caterpillar for adjusting a height of the right front wheel or caterpillar relative to the chassis; a third working cylinder rigidly connected to the chassis and connected to

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the left rear wheel or caterpillar for adjusting a height of the left rear wheel or caterpillar relative to the chassis; a fourth working cylinder rigidly connected to the chassis and connected to the right rear wheel or caterpillar for adjusting a height of the right rear wheel or caterpillar relative to the chassis; a rotating working roller or rotor supported from the chassis between the front wheels or caterpillars and the rear wheels or caterpillars and extending transversely to the forward direction; each of the working cylinders including at least one working chamber filled with a pressure medium; and coupling lines connecting the working cylinders to one another and providing a positive hydraulic coupling between the working cylinders in such a way that the left front wheel or caterpillar and the right rear wheel or caterpillar are adjusted in height in the same direction and in the opposite direction to the right front wheel or caterpillar and the left rear wheel or caterpillar.

* * *

29. The road-building machine of claim 26, wherein the machine has a four sided stability pattern having a widest transverse dimension, transverse to the forward direction of the chassis, which widest transverse dimension falls within a footprint of the working roller or rotor.

* * *

35. The road-building machine of claim 26, further comprising: a pressure medium source; at least one working line connecting the pressure medium source to at least one of the coupling lines; and at least one control valve disposed in the at least one working line, the control valve having a first position in which the positive hydraulic coupling between the working cylinders is temporarily cancelled, and having a second position in which the positive hydraulic coupling is restored.

* * *

36. The road-building machine of claim 35, wherein the at least one working line and the at least one control valve are arranged so that an individual one of the wheels or caterpillars is raised in a first operating mode and is lowered in a second operating mode.

JX-0005 at 11:44-15:5.

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B. Claim Construction

1. Level of Ordinary Skill in the Art

For all of the asserted patents, Wirtgen argues:

Wirtgen America submits that a person of ordinary skill in the art as of the filing dates of the Asserted Patents is one who has either: (1) a bachelor's degree (or equivalent) in mechanical engineering or a similar field, and two to five years of experience working on mobile construction machine design or in a similar field; or (2) seven to ten years of experience working on mobile construction machine design or in a similar field. Caterpillar similarly contends that a person of ordinary skill in the art would have either: (1) a bachelor's degree in mechanical engineering or an equivalent degree, and two to five years of experience working on mobile construction machine design, or (2) seven to ten years of experience working on mobile construction machine design. Accordingly, the parties have effectively no dispute over the level of ordinary skill in the art.

Wirtgen Br. at 25.

Caterpillar argues:

A person of ordinary skill in the art at the time of the alleged invention in the '309 patent would have had: 1) a bachelor's degree in mechanical engineering or an equivalent degree, and two to five years of experience working on mobile construction machine design, or machines of comparable complexity; or 2) seven to ten years of experience working on mobile construction machine design. RX-0985C at Q/A 751. Wirtgen's proposed level of skill in the art is not materially different, and neither party has argued that the outcome of this case depends on which party's POSITA definition is adopted.

Caterpillar Br. at 229. Caterpillar proposes the same level of ordinary skill for the '340, '530, and '641 Patents. *Id.* at 20 (addressing the '340 Patent), 75 (addressing the '530 Patent), 152 (addressing the '641 Patent).

The administrative law judge has determined that a person of ordinary skill in the art would have (1) a bachelor's degree (or equivalent) in mechanical engineering or a similar field, and two to five years of experience working on mobile construction machine design or in a

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similar field or (2) seven to ten years of experience working on mobile construction machine design. *See* CX-0006C (Meyer WS) at Q/A 31; RX-0985C (Alleyne WS) at Q/A 751.

2. Agreed Construction

The parties agree that the terms “positively coupled” and “positive hydraulic coupling,” which appear in claims 1 and 26, mean “hydraulically connected in such a way that movement of one actuating member causes another actuating member to move.” *Caterpillar Br.* at 230.

3. Disputed Construction

The parties dispute three phrases:

- “[can be] [are] adjusted in height in the same direction and in the opposite direction” (claims 1, 26)
- “the valve control is designed such that all the wheels are raised in a first operating mode and are lowered in a second operating mode, this taking place in each case by the same amount” (claim 10)
- “the at least one working line and the at least one control valve are arranged so that an individual one of the wheels or caterpillars is raised in a first operating mode and is lowered in a second operating mode” (claim 36)

See Caterpillar Br. at 229-30; *Wirtgen Reply* at 72-74.

a) *“adjusted in height in the same direction and in the opposite direction”*

Claim 1 requires a machine with a left front wheel or caterpillar (*i.e.*, a continuous track) and a right rear wheel or caterpillar “can be adjusted in height in the same direction and in the opposite direction to the right front wheel or caterpillar and the left rear wheel or caterpillar[.]” *JX-0005* at 11:51-55. Claim 26 requires a machine with an assembly where a left front wheel or caterpillar and a right rear wheel or caterpillar “are adjusted in height in the same direction and in the opposite direction[.]” *Id.* at 14:19-25.

The parties propose the following constructions for the disputed phrase:

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Wirtgen's Proposed Construction	Caterpillar's Proposed Construction
Plain meaning, which is "adjusted in height similarly and inversely"	"capable of being adjusted either in the same direction or in the opposite direction"

See Wirtgen Initial Claim Construction Br. at 41; Caterpillar Br. at 229.

Wirtgen argues, in part, that under Caterpillar's construction "a machine that is capable of adjusting all four wheels in the same direction only would fall within the scope of the claim. But that construction ignores the entire invention, which provides for diagonal pairs of wheels to move in the opposite directions relative to each other." Wirtgen Initial Claim Construction Br. at 42. Wirtgen adds that the "purpose of the invention in this context is that diagonal pairs of wheels move inversely to each other when the machine encounters an uneven section of road, in order to stabilize the machine. If all four wheels moved in the same direction when the machine encountered an uneven section of road, the machine would become even less stable, thus defeating the whole point of the invention." *Id.*

Caterpillar argues, in part, that through "positive coupling, *each pair* of diagonally-opposed actuators must be capable of being adjusted either in the 'same direction' or in the 'opposite direction' as the other pair of diagonally-opposed actuators. If the actuators do not have this dual capability, then they do not meet this claim requirement." Caterpillar Initial Claim Construction Br. at 57 (emphasis added). Caterpillar relies on figure 5 of the '309 Patent and corresponding text in support of its argument that a diagonal pair of wheels (*e.g.*, (1) the left front and right rear or (2) the right front and left rear) must move in the same direction. *Id.* at 58.¹⁹

¹⁹ In disputing infringement, Caterpillar argues that the applicant's response to a restriction requirement supports its theory:

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Wirtgen replies, in part, that a person of ordinary skill “would not consider a machine that only raises and lowers all wheels in the same way to satisfy the limitations of this claim.”

Wirtgen Reply Claim Construction Br. at 23. Wirtgen points to claim 13 as an example of an instance where the patent contemplates simultaneous movement of two wheels “are adjusted in height in the same direction and by the same amount.” *Id.*; JX-0005 at 12:64-13:2.

Caterpillar replies that using the words “to each other” would “fundamentally change the meaning of the claim.” Caterpillar Reply Claim Construction Br. at 30-31. Caterpillar also

Thus, in response to the restriction requirement, the applicant merely attempted to overcome the restriction requirement by clarifying that each of the arrangements in Figures 2-5 provides the identical positive coupling to that of Fig. 1 when the various control valves of Figs. 2-5 are in their closed positions. JX-0010.0361. The Examiner rejected this and maintained the restriction requirement. *Id.* Thus, the argument apparently did not persuade the Examiner. In the Notice of Allowance, however, the Examiner allowed the elected claims and the withdrawn claims with no explanation. JX-0010.0412. The Examiner never agreed that claim 1 was generic and covered all of Figures 1-5. Thus, this prosecution history actually supports Caterpillar’s position that claim 1 is directed toward the Figure 5 embodiment, which includes both the Figure 1 capability and the additional capability to use hydraulic coupling to pitch and roll the machine. It is this dual capability that claim 1 was drafted to cover.

Caterpillar Br. at 270-71. The administrative law judge has determined, however, that the restriction requirement and notice of allowance do not merit much weight with regard to the disputed phrase, as the restriction requirement was focused on “the different arrangement of the valves in Figs. 2-5” and the notice of allowance does not address the term. *See* JX-0010 at 367 (making the restriction requirement final), 349 (discussing various piston, cylinder, and valve arrangements), 408-32 (the notices of allowance do not provide any substantive commentary); *Plantronics, Inc. v. Aliph, Inc.*, 724 F.3d 1343, 1351 (Fed. Cir. 2013) (in analyzing a prosecution history where the applicant elected one species in response to a restriction requirement, the Federal Circuit determined that “[t]he election of an invention in response to an ambiguous restriction requirement in turn cannot be said to provide any guidance forming a basis for narrowing a broadly drafted claim.”); *see also Honeywell Int’l, Inc. v. ITT Indus., Inc.*, 452 F.3d 1312, 1319 (Fed. Cir. 2006) (the Federal Circuit did “not assign much weight” to a restriction requirement that did not construe a relevant claim term).

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argues it is not limiting the claim to just one embodiment, as its construction would encompass movement where both diagonal wheel pairs are moving up or down together. *Id.* at 31-32 (citing JX-0005 at 7:29-36).

The administrative law judge construes “can be adjusted in height in the same direction and in the opposite direction to the right front wheel or caterpillar and the left rear wheel or caterpillar” and “are adjusted in height in the same direction and in the opposite direction” to mean “adjusted in height similarly and inversely,” which is Wirtgen’s construction.

The specification explains that “[t]he object on which the present invention is based is, therefore, to improve the stability of the road-building machines initially mentioned, as compared with the prior art mentioned.” JX-0005 at 2:13-16. The specification then explains that “[t]his object is achieved, according to the invention, by means of the features specified in patent claim 1.” *Id.* at 2:24-25.²⁰ Using language that tracks claim 1, the specification adds that:

According to the invention, the actuating members are connected rigidly to the chassis of the road-building machine and are positively coupled to one another. The positive coupling is in this case designed such that the left front wheel and the right rear wheel are adjusted in height in the opposite direction to the right front wheel and the left rear wheel, the left front wheel and the right rear wheel being adjusted in height in the same direction.

Id. at 2:42-47. The specification provides an additional explanation when describing how a machine built according to claim 1 would operate. *Id.* at 6:31-64 (“the left front wheel 4 and the right rear wheel 10 are adjusted in height in the opposite direction to the right front wheel 6 and the left rear wheel 8, the left front wheel 4 and the right rear wheel 10 being adjusted in height in

²⁰ While original claim 1 was cancelled, it was replaced with claim 17, which is similar to original claim 1. JX-0010 at 29, 81. Claim 17 would issue as claim 1. *Compare* JX-0010 at 81 with JX-0005 at 11:44-59 (claim 1).

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the same direction, and the height adjustment taking place by equal amounts on all the wheels 4, 6, 8, 10.”).

Caterpillar’s proposed construction adds a “dual capability” requirement that unnecessarily limits the claim to just the embodiment shown in Figure 5. Caterpillar Br. at 267 (“the claim language should be construed to require the dual capability of Figure 5 . . . ”); Caterpillar Initial Claim Construction Br. at 56-59. The language “can be” in the disputed phrase does not mean that a diagonal pair of wheels must be able to accommodate pitching or rolling of the machine, as the embodiment shown in Figure 5 contemplates. *See* JX-0005 at 8:64-9:13.²¹

- b) ***“the valve control is designed such that all the wheels are raised in a first operating mode and are lowered in a second operating mode, this taking place in each case by the same amount”***

Claim 9 requires that the machine of claim 1 further includes a valve control that is associated with the coupling lines. Claim 10 further requires that “the valve control is designed such that all the wheels are raised in a first operating mode and are lowered in a second operating mode, this taking place in each case by the same amount.” JX-0005 at 12:50-54.

The parties propose the following constructions for the disputed phrase:

Wirtgen’s Proposed Construction	Caterpillar’s Proposed Construction
Plain meaning, which is “the valve control is capable of taking in pressure medium or letting out pressure medium such that all of the cylinders are raised or lowered by the same amount”	This is a means-plus-function limitation <i>See Williamson v. Citrix Online, LLC</i> , 792 F.3d 1339 (Fed. Cir. 2015). <u>Function:</u> to permit all wheels to be

²¹ JX-0005 at 8:64-9:13 provides: “FIG. 5 shows a diagrammatical illustration of a fourth embodiment of the road-building machine according to the invention, the same reference symbols being used again for identical parts. This exemplary embodiment of the chassis allows either a ‘pitching’ or a ‘rolling’ of the machine. In the ‘pitching’ of the machine, both front wheels 4, 6 are raised or lowered, while both rear wheels 8, 10 are lowered or raised by the same amount in the opposite direction. . . . In rolling, the front and the rear left wheel 4, 8 are raised or lowered, while the front and the rear right wheel 6, 10 are lowered or raised by the same amount.”

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	raised in a first operating mode and lowered in a second operating mode by the same amount. <u>Corresponding Structure:</u> The valve control illustrated in Fig. 2, and structural equivalents thereof.
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See Wirtgen Initial Claim Construction Br. at 45; Caterpillar Br. at 230.

Wirtgen argues that the plain meaning of the disputed phrase would be understood to mean that “the valve control is capable of taking in pressure medium or letting out pressure medium such that all of the cylinders are raised or lowered by the same amount” and that a person of ordinary skill in the art would not limit the phrase “to the example valve control illustrated in Figure 2.” Wirtgen Initial Claim Construction Br. at 45-46.

Caterpillar argues, in part, that:

Claim 10 does not identify any structure for the claimed “valve control.” Thus, a person of ordinary skill in the art at the time of the claimed invention would not have been able to determine anything about the claimed monitoring device except the functions it performs, *i.e.*, that it is designed “such that all the wheels are raised in a first operating mode and are lowered in a second operating mode, this taking place in each case by the same amount.” This is classic means-plus-function claiming. See *Williamson*, 792 F.3d at 1349 (holding that “control module for...” was a means-plus-function limitation despite not reciting “means”). Although claim 10 does not include the word “means,” the presumption against § 112, ¶ 6 is easily overcome here because the claim is devoid of any structure for the claimed “valve control.” *Id.*

Caterpillar Initial Claim Construction Br. at 60. Caterpillar identifies the corresponding structure as Figure 2 and the directional valves depicted in the figure. *Id.* at 62-63.

Wirtgen argues that a “valve control” connotes a physical structure within the mobile construction machine field or art. Wirtgen Reply Claim Construction Br. at 25. Wirtgen further argues that “the specification here describes the claimed valve controls by reciting their

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components, not their functions, which is how structures are identified.” *Id.* (citing JX-0005 at 7:40-45).

In reply, Caterpillar argues that claim 10 “does not identify any structure for the claimed ‘valve control.’ . . . A person of ordinary skill in the art at the time of the claimed invention would not have been able to determine anything about the claimed valve control except the functions it performs, *i.e.*, that it is designed ‘such that all the wheels are raised in a first operating mode and are lowered in a second operating mode, this taking place in each case by the same amount.’” Caterpillar Reply Claim Construction Br. at 33. Caterpillar also argues that the term “valve control” is “too generic to provide sufficiently definite structure.” *Id.* at 34.²²

The administrative law judge has determined that the phrase “the valve control is designed such that all the wheels are raised in a first operating mode and are lowered in a second operating mode, this taking place in each case by the same amount” should be afforded its plain and ordinary meaning, and that a person of skill in the art would understand that this phrase to mean that the valve control is capable of taking in pressure medium or letting out pressure medium such that all of the cylinders are raised or lowered by the same amount.

The specification describes the valve control as follows:

The second embodiment has, furthermore, a valve control which comprises a first directional valve 56 in the first connecting line 44, a second directional valve 58 in the second connecting line 46 and a third directional valve 60 in the working lines 48, 50. When the third directional valve 60 is brought into the position a, while the first and the second directional valve 56, 58 are opened, pressure medium flows from the pressure medium source 54 via the corresponding lines into the second working chamber 28, 30, 32, 34 of the working cylinders 12, 14, 16, 18. In reaction, the pressure medium is pressed out of the first working chamber 20, 22, 24, 26 of the working

²² Nonetheless, Caterpillar was able to identify structure in the prior art for its invalidity arguments. *See* Caterpillar Br. at 246 (asserting that “this type of valve control can be found in Mannebach.”).

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cylinders 12, 14, 16, 18 and is discharged via the corresponding lines into the pressure medium sump 52. In this first operating mode, the positive coupling described above is consequently canceled briefly, and the wheels 4, 6, 8, 10 are raised by equal amounts. In a second operating mode, in which the third directional valve 60 assumes the position B, while the first and the second directional valve 56, 58 are opened, conversely, a lowering of the wheels 4, 6, 8, 10 by equal amounts takes place. As a result of the closing of the first, the second and the third directional valve 56, 58, 60, as illustrated in FIG. 2, the valve control can be brought again into an operating mode in which the positive coupling described above is restored.

The directional valves are preferably electromechanically actuated valves. The devices required for actuating the valves are generally known to a person skilled in the art. Preferably, the valves are spring-prestressed, so that, after the height correction of the building machine, they assume their initial position again as soon as they are no longer activated. The road-building machine then behaves in the same way as in the first exemplary embodiment.

JX-0005 at 7:17-45. The specification's description that "wheels 4, 6, 8, 10 are raised by equal amounts" in operation supports the construction and how a person of ordinary skill in the art would understand the phrase. *See id.* Likewise, the specification's acknowledgement that the devices "for actuating the valves are generally known to a person skilled in the art" indicates that the disputed "valve control" refers to a structural unit rather than a functional concept, which signals that the phrase does not invoke § 112, ¶ 6. *Id.*; *see also Chrimar Holding Co., LLC v. ALE USA Inc.*, No. 2017-1848, 2018 WL 2120618, at *6 (Fed. Cir. May 8, 2018) ("A claim term that has an understood meaning in the art as reciting structure is not a nonce word triggering § 112, ¶ 6."); *Skky, Inc. v. MindGeek, s.a.r.l.*, 859 F.3d 1014, 1019 (Fed. Cir. 2017), cert. denied, 138 S. Ct. 1693 (2018) ("To determine whether a claim recites sufficient structure, 'it is sufficient if the claim term is used in common parlance or by persons of skill in the pertinent art to designate structure, even if the term covers a broad class of structures and even if the term identifies the structures by their function.'" (quoting *TecSec, Inc. v. Int'l Bus. Machs. Corp.*, 731

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F.3d 1336, 1347 (Fed. Cir. 2013)); *Personalized Media Commc'ns, LLC v. Int'l Trade Comm'n*, 161 F.3d 696, 705 (Fed. Cir. 1998) (holding that “[e]ven though the term ‘detector’ does not specifically evoke a particular structure, it does convey to one knowledgeable in the art a variety of structures known as ‘detectors.’”).

- c) ***“the at least one working line and the at least one control valve are arranged so that an individual one of the wheels or caterpillars is raised in a first operating mode and is lowered in a second operating mode”***

The disputed phase constitutes the entire substantive portion of claim 36, which depends from claims 26 and 35.²³

The parties propose the following constructions for the disputed phrase:

Wirtgen's Proposed Construction	Caterpillar's Proposed Construction
Plain meaning, which is “the valve control is capable of taking in fluid or letting out fluid such that one wheel is raised or lowered”	<p>This is a means-plus-function limitation <i>See Williamson v. Citrix Online, LLC</i>, 792 F.3d 1339 (Fed. Cir. 2015).</p> <p><u>Function</u>: to permit an individual wheel [or caterpillar] to be raised in a first operating mode and lowered in a second operating mode.</p> <p><u>Corresponding structure</u>: The valve control illustrated in Fig. 3, and structural equivalents thereof.</p>

See Wirtgen Initial Claim Construction Br. at 46; Caterpillar Br. at 230.

Wirtgen's entire argument is:

A person of ordinary skill in the art reading the '309 patent would understand the terms “the valve control is designed such that an individual wheel is raised in a first operating mode and is lowered

²³ Claim 36 follows: “36. The road-building machine of claim 35, wherein the at least one working line and the at least one control valve are arranged so that an individual one of the wheels or caterpillars is raised in a first operating mode and is lowered in a second operating mode.” JX-0005 at 15:1-5.

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in a second operating mode” / “the at least one working line and the at least one control valve are arranged so that an individual one of the wheels or caterpillars is raised in a first operating mode and is lowered in a second operating mode” to mean “the valve control is capable of taking in fluid or letting out fluid such that one wheel is raised or lowered” based on the plain meaning of claims 11 and 36. As discussed above, a person of ordinary skill in the art would not understand the valve control to be limited to the example valve control illustrated in Figure 3. Velinsky at ¶88.

Wirtgen Initial Claim Construction Br. at 46.

Caterpillar’s entire argument is:

The ALJ should adopt Caterpillar’s proposed constructions for “valve control” limitations for the same reasons explained above for the “valve control” limitation in claim 10 of the ‘309 patent. Namely, these are all means-plus-function limitations, but the specification fails to disclose adequate corresponding structure for performing the claimed “valve control” functions. *See* Section VII.B.2, *supra*.

Caterpillar Initial Claim Construction Br. at 67; *see also* Caterpillar Reply Claim Construction Br. at 39 (the same argument is presented, verbatim).

Wirtgen replies that claims 10, 11, 33, and 36 provide “important context” that indicates that a “the various structural embodiments of the valve control . . . could be adapted for any of the claims” and that a “valve control is a structure, and the various embodiments described in the specification and depicted in the figures disclose the physical components of that structure.”

Wirtgen Reply Claim Construction Br. at 27.

Having considered the parties’ arguments, the administrative law judge has determined that the phrase “the at least one working line and the at least one control valve are arranged so that an individual one of the wheels or caterpillars is raised in a first operating mode and is lowered in a second operating mode” should be afforded its plain and ordinary meaning, where one of ordinary skill in the art would understand means that “the valve control is capable of

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taking in fluid or letting out fluid such that one wheel is raised or lowered.” The specification explains that hydraulic oil is utilized to raise or lower the machine and that a wheel or caterpillar can be moved independently from its counterparts. *See* JX-0005 at 7:60-8:47. The claims and specification are not limited to the particular embodiment shown in Figure 3. *See, e.g.*, JX-0005 at 10:15-18 (“The hydraulic circuits described may also comprise additional components, for example accumulators, throttles and the like, which, however, are not absolutely necessary for the basic functions of the circuit.”); 5:1-3 (noting the figures show “exemplary embodiments”). Further, the specification acknowledges that devices “for actuating the valves are generally known to a person skilled in the art” which indicates that one of skill in the art is aware of suitable corresponding structures.

C. Infringement

Wirtgen argues that Caterpillar’s PM620 literally infringes claims 10, 29, and 36. Wirtgen Br. at 202. Claim 10 depends from claims 1 and 9; claim 29 depends from claim 26; and claim 36 depends from claims 26 and 35.

1. Claim 1

For its infringement analysis, Wirtgen divides claim 1 into six limitations, as follows:

1[p] 1. A road-building machine,

1[a] of which a left front wheel or caterpillar, right front wheel or caterpillar, left rear wheel or caterpillar and right rear wheel or caterpillar is connected to a chassis of the road-building machine

1[b] by means of an actuating member and is adjustable in height with respect to a frame of the road-building machine, the individual actuating members being connected rigidly to the chassis and

1[c] being positively coupled to one another in such a way that the left front wheel or caterpillar and the right rear wheel or caterpillar can be adjusted in height in the same direction and in the opposite direction to the right front wheel or caterpillar and the left rear wheel or caterpillar, and

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1[d] the actuating members being designed as double-acting working cylinders with a first and a second working chamber which are filled with a pressure medium,

1[e] the working cylinders being connected to one another via coupling lines.

See CDX-0001C (Lumkes Demonstratives) at 89-96; CX-0004C (Lumkes WS) at Q/A 207-229;

see also Wirtgen Br. at 201-09. Each limitation is addressed below.

a) 1[p] 1. A road-building machine

Wirtgen argues:

the PM620 is a cold milling machine that mills paved surfaces during road construction. As such, a cold milling machine is a road-building machine as recited in the preamble of claim 1. CX-0004C Q208 (Lumkes Opening WS); see also CX-0137.0022 (PM620, 622 Product Manual (4,2017)); CX-0985C (CAT PM620 photo 3).

Wirtgen Br. at 202.

Caterpillar does not dispute that the PM620 is a road-building machine. See generally Caterpillar Br. at 266-78; Caterpillar Reply at 85-90.

The evidence shows that the PM620 is a road-building machine. See CX-0004C (Lumkes WS) at Q/A 208; see also CX-0137 (PM620 and PM622 Product Manual) at 3 (“The PM620 and PM622 . . . suit the application, from milling highways to urban streets.”).

Accordingly, the administrative law judge has determined that the PM620 is a road-building machine, as the preamble describes.

b) 1[a] of which a left front wheel or caterpillar, right front wheel or caterpillar, left rear wheel or caterpillar and right rear wheel or caterpillar is connected to a chassis of the road-building machine

Wirtgen argues:

The PM620 includes a left front track, right front track, left rear track, and a right rear track that are connected to a chassis of the PM620 by four adjustable-height legs at each corner of the machine.

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CX-0004C Q209 (Lumkes Opening WS); CX-0986C (CAT PM620 photo 4); CX-0061C.0531-0532 (PM620 Parts Manual); CX-0069.0481 (2016-04-00_parts manual). Each of these tracks is a “wheel or caterpillar” as recited in element 1[a]. CX-0004C Q209 (Lumkes Opening WS).

Wirtgen Br. at 202.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 266-78 (the limitation is not contested); Caterpillar Reply at 85-90 (same).

The evidence shows that the PM620 includes a left front track, right front track, left rear track, and a right rear track, which are connected to a chassis via four adjustable-height legs. *See* CX-0004C (Lumkes WS) at Q/A 209-10; CX-0986C (CAT PM620 photo 4); CX-0061C.0531-0532 (PM620 Parts Manual); CX-0069.0481 (PM620 Parts Manual). Accordingly, the administrative law judge has determined that the PM620 includes four tracks and a chassis, as limitation 1[a] requires.

- c) ***1[b] by means of an actuating member and is adjustable in height with respect to a frame of the road-building machine, the individual actuating members being connected rigidly to the chassis***

Wirtgen argues:

Each adjustable leg of the PM620 includes a hydraulic cylinder, which is an actuating member. CX-0004C Q212 (Lumkes Opening WS); CX-0061C.0558 (PM620 Parts Manual). The PM620 tracks are connected to the chassis by the hydraulic cylinders housed within the legs, and the cylinders extend or retract to adjust the height of the legs with respect to the PM620's frame. CX-0004C Q211 (Lumkes Opening WS); CX-0061C.0569, .0568 (PM620 Parts Manual). These individual actuating members are connected rigidly to the chassis, as recited in element 1[b]. CX-0004C Q211 (Lumkes Opening WS); CX-0061C.0569, .0568 (PM620 Parts Manual). One end of each hydraulic leg cylinder is bolted, which is a rigid connection, to an upper tubular member of the PM620's adjustable legs. CX-0004C Q213 (Lumkes Opening WS); CX-0061C.0558, .0559 (PM620 Parts Manual). The upper tubular member of the PM620's adjustable legs is welded, which is also

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rigid connection, to the PM620 frame which is part of the chassis. CX-0004C Q213 (Lumkes Opening WS); CX-0061C.0532 (PM620 Parts Manual). Due to these rigid connections, each hydraulic leg cylinder is rigidly connected to the chassis of the PM620 via the upper tubular member of the leg. CX-0004C Q213 (Lumkes Opening WS); CDX-0001C.0092 (Lumkes Direct Demonstrative).

Wirtgen Br. at 202-03.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 266-78 (the limitation is not contested); Caterpillar Reply at 85-90 (same).

The evidence shows that the PM620 includes four tracks that are connected to a chassis via hydraulic cylinders, which are actuating members. *See* CX-0004C (Lumkes WS) at Q/A 212; CX-0061C (PM620 Parts Manual) at 558. The hydraulic cylinders can extend and retract to adjust the height of the legs with respect to the PM620's frame. *See* CX-0004C (Lumkes WS) at Q/A 211-12; CX-0061C (PM620 Parts Manual) at 558, 568-69. Further, each of the hydraulic cylinders are bolted to an upper, tubular portion of the leg, and the upper, tubular portions of the legs are welded to the chassis. *See* CX-0004C (Lumkes WS) at Q/A 213; CX-0061C (PM620 Parts Manual) at 532, 558-59. Thus, the legs are rigidly connected to the chassis. *Id.* Accordingly, the administrative law judge has determined that the PM620's legs include height-adjustable actuating members that are rigidly connected to the chassis, as limitation 1[b] requires.

- d) *1[c] being positively coupled to one another in such a way that the left front wheel or caterpillar and the right rear wheel or caterpillar can be adjusted in height in the same direction and in the opposite direction to the right front wheel or caterpillar and the left rear wheel or caterpillar*

Wirtgen argues that the PM620's ride control feature positively couples the PM620's hydraulic leg cylinders in series "such that the hydraulic leg cylinders are hydraulically connected and the movement of one hydraulic cylinder causes another hydraulic cylinder to

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move.” Wirtgen Br. at 203. Wirtgen alleges that the PM620 utilizes “essentially the same hydraulic circuit shown in Figure 1 of the ‘309 patent.” *Id.* at 204. Wirtgen explains the motion as follows:

This configuration ensures that the left front wheel or caterpillar and the right rear wheel or caterpillar can be adjusted in height similarly to each other and inversely to the left front wheel or caterpillar and the left rear wheel or caterpillar. For example, if the left front track runs over a raised obstacle and the ride control feature is activated, the left front piston would retract (moves up), causing the hydraulic fluid in the head-end chamber of the left front cylinder to travel towards the head-end chamber of the left rear cylinder which in turn causes the left rear piston to extend (move down). At the same time, extension of the left rear piston causes the hydraulic fluid in the rod-end chamber of the left rear cylinder to move towards the rod-end chamber of the right rear cylinder, causing the right rear piston to retract (move up). At the same time, retraction of the right rear piston causes the hydraulic fluid in the head-end chamber of the right rear cylinder to move towards the head-end chamber of the right front cylinder, causing the right front piston to extend (move down). At the same, extension of the right front piston causes the hydraulic fluid in the rod-end chamber of the right front cylinder to move towards the rod-end chamber of the left front cylinder, filling the volume vacated by the left front piston that retracted when it encountered the raised obstacle. CX-0004C Q219 (Lumkes Opening WS); see also CX-0068.0049 (PM620 and PM622 Cold Planers Machine System); CDX-0001C.0094 (Lumkes Direct Demonstrative). The resulting movement of the cylinders is shown below.

[
– Figure omitted –
]

CX-0591C.0263 (PM600 Technical Presentation) (annotated);
CDX-0001C.0094 (Lumkes Direct Demonstrative). This is the
motion recited in element 1[c].

Id. at 204-05.²⁴

Caterpillar argues that the PM620 does not infringe under its construction or Wirtgen's construction. Caterpillar Br. at 266. Caterpillar's arguments "[a]pplying Wirtgen's proposed construction" begin with an extensive critique of Wirtgen's claim construction. *Id.* at 267 ("Because "to each other" is not part of the original claim language (or even Wirtgen's proposed construction), the claim language should be construed to require the dual capability of Figure 5—*i.e.*, the left front wheel or caterpillar and the right rear wheel or caterpillar being must be adjustable in height similarly and inversely to the right front wheel or caterpillar and the left rear wheel or caterpillar."). After this critique, Caterpillar argues:

²⁴ Wirtgen acknowledges that the PM620 does not infringe under Caterpillar's claim construction. See Wirtgen Br. at 200 ("The parties' fundamental dispute on the '309 patent is one of claim construction. If Caterpillar's restrictive claim construction is adopted, the claims of the '309 patent will not read on Caterpillar's machines, Wirtgen's domestic industry machines, or 80% of the illustrated embodiments, *e.g.*, 4 out of 5 Figures in the '309 patent that depict the claimed invention would be excluded using Caterpillar's interpretation.").

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Wirtgen has not shown that the accused PM600 and PM800 machines have this dual capability, as required by *both* parties' constructions. RX-0991C (Alleyne Rebuttal Witness Statement) at Q/A 325-335. At most, Dr. Lumkes has shown that in the PM600 and PM800 series machines the left front wheel or caterpillar and the right rear wheel or caterpillar can be adjusted in height similarly to each other and inversely to the right front wheel or caterpillar and the left rear wheel or caterpillar. *Id.* This is insufficient to meet the limitation because Wirtgen has not shown that the PM600 and PM800 series machines have the dual capability of the front wheel or caterpillar and the right rear wheel or caterpillar being adjusted in height similarly and inversely to the right front wheel or caterpillar and the left rear wheel or caterpillar. *Id.*

... In fact, the PM600 and PM800 machines are not capable of using "positive coupling" to adjust the left front track and the right rear track in the same direction as the right front track and the left rear track," as required by the claims. Instead, to accomplish this motion, ride control must be deactivated, which means positive coupling is cancelled.

Id. at 268. Caterpillar concludes that it is "not possible to arrange the ride control valves to allow the left front elevation cylinder and the right rear elevation cylinder to move in the same direction as the right front elevation cylinder and the left rear elevation cylinder, as required by the claims ***under Caterpillar's construction.***" *Id.* (bold and italics added).

In reply, Caterpillar represents that it does not dispute Wirtgen's general description of how the PM620 ride control works. Caterpillar Br. at 86. Caterpillar then argues it is improper to add "to each other" in construing the disputed phrase. *Id.* at 86-87 ("These extraneous words fundamentally change the meaning of the claim language, converting it from a dual-capability system as shown in Figure 5 of the '309 patent, to a single-capability system as shown in Figure 1 of the patent. Wirtgen has not shown this required dual functionality.").

Having considered the parties' arguments, the administrative law judge has determined that the evidence shows that the PM620 includes four tracks that are positively coupled to one another such that the left front caterpillar and the right rear caterpillar can be adjusted in height

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similarly and inversely in relation to the right front caterpillar and the left rear caterpillar. As noted above, the parties agree on how the PM620 operates. See CX-0004C (Lumkes WS) at Q/A 219-24; RX-0991C (Alleyne RWS) at Q/A 325 (“I do not disagree with Dr. Lumkes’ general description of these reactions when the ride control feature is enabled.”). As Dr. Lumkes explained, the arrangement of the PM620’s hydraulic system allows the left front piston and the right rear piston to retract (move up) and the right front piston and the left rear piston to extend (move down). CX-0004C (Lumkes WS) at Q/A 220 (“That is, when the ride control feature is activated, the PM620’s left front track and the right rear track are adjusted in height similarly to each other and inversely to the right front track and the left rear track, as recited in claim 1.”). Thus, the PM620 includes four tracks that are positively coupled to one another such that the left front caterpillar and the right rear caterpillar can be adjusted in height similarly and inversely in relation to the right front caterpillar and the left rear caterpillar, as limitation 1[c] requires.

- e) ***1[d] the actuating members being designed as double-acting working cylinders with a first and a second working chamber which are filled with a pressure medium***

Wirtgen argues:

The PM620’s hydraulic leg cylinders are double-acting working cylinders with a first and a second working chamber that are filled with a pressure medium as recited in element 1[d]. CX-0004C Q225 (Lumkes Opening WS); CX-0061C.0569 (PM620 Parts Manual); CX-0153C.0018 (PM620 Systems Manual); CX-0591C.0263 (PM600 Technical Presentation). The PM620 hydraulic system is configured to [

] of the cylinders. CX-0004C Q227 (Lumkes Opening WS); CX-0153C.0018 (PM620 Systems Manual); CX-0591C.0263 (PM600 Technical Presentation). Thus, the cylinders are double acting working cylinders as recited in element 1[d].

Wirtgen Br. at 205-06.

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Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 266-78 (the limitation is not contested); Caterpillar Reply at 85-90 (same).

The evidence shows that the PM620's hydraulic leg cylinders are double-acting working cylinders with two chambers that are filled with hydraulic oil, which is a pressure medium. *See* CX-0004C (Lumkes WS) at Q/A 225-28. Accordingly, the administrative law judge has determined that the PM620's hydraulic leg cylinders constitute the actuating members recited in limitation 1[d].

f) 1[e] the working cylinders being connected to one another via coupling lines.

Wirtgen argues:

The PM620 includes the recited coupling lines that connect the hydraulic leg cylinders together as recited in element 1[e]. In the above image, the recited coupling lines are in blue. CX-0591C.0263 (PM600 Technical Presentation); CX-0068.0049 (PM620 and PM622 Cold Planers Machine System); CX-0153C.0005, .0011, .0014, .0020, .0029-0030, .0048 (PM620 Systems Manual).

Wirtgen Br. at

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 266-78 (the limitation is not contested); Caterpillar Reply at 85-90 (same).

The evidence shows that the PM620's hydraulic leg cylinders are connected via coupling lines. *See* CX-0004C (Lumkes WS) at Q/A 229; CDX-0001C.96 (annotating CX-0591C.0263 (PM600 Technical Presentation)). Accordingly, the administrative law judge has determined that the PM620 includes working cylinders connected via coupling lines, as limitation 1[e] requires.

Thus, in summary, the PM620 infringes claim 1.

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2. Claim 9

Claim 9 requires that the coupling lines of claim 1 “can be connected to a pressure medium source and/or a pressure medium sump via working lines with the aid of a valve control.” JX-0005 at 12:46-49.

Wirtgen argues, in part:

Turning to the features of intervening dependent claim 9, the PM620 coupling lines are connected to a pressure medium source via working lines with the aid of a valve control. CX-0004C Q230 (Lumkes Opening WS); CX-0591C.0263, .0258-261 (PM600 Technical Presentation); CX-0068.0049 (PM620 and PM622 Cold Planers Machine System); CX-0153C.0005, 0011, .0014, .0020, .0029-0030, .0048 (PM620 Systems Manual); CDX-0001C.0096 (Lumkes Direct Demonstrative). As shown in the annotated version of CX-0591C (PM600 Technical Presentation) below, the PM620 hydraulic system [] (i.e., a pressure medium source) that is circled with an annotated red circle.

[

– Figure omitted –

]

Extending between the pump and the blue coupling lines are working lines shown in red and green. And the valve control is a plurality of control valves annotated in purple. The PM620 valve control includes [

].

As such the PM620’s valve control (purple) and the working lines (red and green) connect the pressure medium source (red) to the coupling lines (blue).

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Wirtgen Br. at 206-07.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 266-78 (claim 9 is not contested); Caterpillar Reply at 85-90 (same).

The evidence shows that the PM620's coupling lines are connected to a hydraulic pump via working lines and a plurality of control valves. *See* CX-0004C (Lumkes WS) at Q/A 230-34; CDX-0001C.96 (annotating CX-0591C (PM600 Technical Presentation)). Accordingly, the administrative law judge has determined that the PM620 includes the pressure medium source, working lines, and valve control recited in claim 9, and thus infringes claim 9.

3. Claim 10

Claim 10 requires that the valve control of claim 9 is configured such that "all the wheels are raised in a first operating mode and are lowered in a second operating mode, this taking place in each case by the same amount." JX-0005 at 12:50-54.²⁵

Wirtgen argues:

The PM620 valve control can raise all the tracks or wheels in a first operating mode and lower all tracks or wheels a second operating mode, the raising and lowering taking place in each case by the same amount as recited in claim 10. . . . As a caveat, the '309 patent specification and claims use the terms "wheel" and "caterpillar" interchangeably. In fact, the '309 patent specification at column 2, lines 32-33, expressly defines the term "wheel" to also include the term caterpillar. The PM620's tracks are caterpillars and, thus, meet the limitation of claim 10. The PM620 hydraulic system has a first operating mode, namely, [] shown at CX-0591C.0259 (PM600 Technical Presentation) in CDX-0001C.0098 (Lumkes Direct Demonstrative), in which the PM620's []

can have a first configuration that [] by directing oil to the rod-end chambers of the hydraulic leg cylinders.

²⁵ The parties occasionally use the terms "legs" and "wheels" interchangeably, particularly with respect to raising and lowering events.

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Wirtgen Br. at 207-08; *see also* Wirtgen Reply at 73 (arguing that the specification “expressly defines the term ‘wheels’ to include wheels or caterpillars.”).

Caterpillar argues that the PM620 does not infringe claim 10 because the PM620 features caterpillars (tracks), and thus lacks wheels, as claim 10 requires. *See* Caterpillar Br. at 271-72.

The administrative law judge has determined that the PM620 does not infringe claim 10 because it lacks wheels. *See* RX-0991C (Alleyne Rebuttal Witness Statement) at Q/A 338-339 (“the PM600 and PM800 series machines do not have ‘wheels.’ Rather, they have ‘caterpillars’ or ‘tracks.’”). The specification does not expressly define wheels as encompassing wheels and tracks. The portion of the specification Wirtgen cites, with additional context, follows:

The road-building machine according to the invention has a left front wheel or caterpillar, a right front wheel or caterpillar, a left rear wheel or caterpillar and a right rear wheel or caterpillar. When a front wheel is referred to hereinafter, this is also understood to mean a caterpillar. Each of said wheels is assigned in each case an actuating member, with the aid of which the respective wheel is connected to the chassis of the road-building machine and can be adjusted in height in relation to the frame or chassis of the road-building machine. The frame can thereby be adjusted in height and oriented in relation to the ground. In this context, a height adjustment of the wheels is simply referred to hereafter. According to the invention, the actuating members are connected rigidly to the chassis of the road-building machine and are positively coupled to one another. The positive coupling is in this case designed such that the left front wheel and the right rear wheel are adjusted in height in the opposite direction to the right front wheel and the left rear wheel, the left front wheel and the right rear wheel being adjusted in height in the same direction.

JX-0005 at 2:28-47. The “express definition” is limited to the specification alone, as the independent claims use the language “wheel or caterpillar” rather than just a wheel.

Additionally, the specification’s explanation that “[w]hen a front wheel is referred to hereinafter, this is also understood to mean a caterpillar” does not clearly and unmistakably show an intent to define all wheels, because the statement is limited to a front wheel. *See Thorner v. Sony*

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Computer Entm't Am. LLC, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (“To act as its own lexicographer, a patentee must “clearly set forth a definition of the disputed claim term” other than its plain and ordinary meaning.”); *see also GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) (“To act as its own lexicographer, a patentee must “clearly set forth a definition of the disputed claim term,” and “clearly express an intent to [re]define the term.”); *Luminara Worldwide, LLC v. Liown Elecs. Co.*, 814 F.3d 1343, 1353 (Fed. Cir. 2016) (“The standards for finding lexicography and disavowal are ‘exacting.’”). Thus, the specification fails to define a “wheel” as clearly including a wheel and caterpillar. Accordingly, the PM620 does not infringe claim 10 because it lacks wheels.²⁶

4. Claim 26

For its infringement analysis, Wirtgen divides claim 26 into six limitations, as follows:

26[p] 26. A road-building machine, comprising:

26[a] a chassis having a forward direction;

26[b] a left front wheel or caterpillar; a right front wheel or caterpillar; a left rear wheel or caterpillar; a right rear wheel or caterpillar;

26[c] a first working cylinder rigidly connected to the chassis and connected to the left front wheel or caterpillar for adjusting a height of the left front wheel or caterpillar relative to the chassis; a second working cylinder rigidly connected to the chassis and connected to the right front wheel or caterpillar for adjusting a height of the right front wheel or caterpillar relative to the chassis; a third working cylinder rigidly connected to the chassis and connected to the left rear wheel or caterpillar for adjusting a height of the left rear wheel or caterpillar relative to the chassis; a fourth working cylinder rigidly connected to the chassis and connected to the right rear wheel or caterpillar for adjusting a height of the right rear wheel or caterpillar relative to the chassis;

²⁶ Wirtgen has not argued that the PM620 infringes claim 10 under the doctrine of equivalents.

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26[d] a rotating working roller or rotor supported from the chassis between the front wheels or caterpillars and the rear wheels or caterpillars and extending transversely to the forward direction;

26[e] each of the working cylinders including at least one working chamber filled with a pressure medium; and

26[f] coupling lines connecting the working cylinders to one another and providing a positive hydraulic coupling between the working cylinders in such a way that the left front wheel or caterpillar and the right rear wheel or caterpillar are adjusted in height in the same direction and in the opposite direction to the right front wheel or caterpillar and the left rear wheel or caterpillar.

See CDX-0001C (Lumkes Demonstratives) at 101-11; CX-0004C (Lumkes WS) at Q/A 241-253; *see also* Wirtgen Br. at 210-15. Each limitation is addressed below.

a) 26[p] 26. A road-building machine, comprising:

Wirtgen argues the PM620 is a road-building machine. *See* Wirtgen Br. at 210.

Caterpillar does not dispute that the PM620 is a road-building machine. *See generally* Caterpillar Br. at 266-78; Caterpillar Reply at 85-90.

The evidence shows that the PM620 is a road-building machine. *See* CX-0004C (Lumkes WS) at Q/A 208, 242; *see also* CX-0137 (PM620 and PM622 Product Manual) at 3 (“The PM620 and PM622 . . . suit the application, from milling highways to urban streets.”). Accordingly, the administrative law judge has determined that the PM620 is a road-building machine, as the preamble describes.

b) 26[a] a chassis having a forward direction;

Wirtgen argues the PM620 includes a chassis having a forward direction. *See* Wirtgen Br. at 210. Caterpillar does not dispute that the PM620 includes a chassis. *See generally* Caterpillar Br. at 266-78; Caterpillar Reply at 85-90.

The evidence shows that the PM620 includes a chassis having a forward direction. *See* CX-0004C (Lumkes WS) at Q/A 243; CX-0061C (PM620 Parts Manual) at 503. Accordingly,

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the administrative law judge has determined that the PM620 includes a chassis having a forward direction, as limitation 26[a] recites.

- c) ***26[b] a left front wheel or caterpillar; a right front wheel or caterpillar; a left rear wheel or caterpillar; a right rear wheel or caterpillar;***

Wirtgen argues the PM620 includes left front, right front, left rear, and right rear caterpillars. *See* Wirtgen Br. at 210. Caterpillar does not dispute that the PM620 includes these four caterpillars. *See generally* Caterpillar Br. at 266-78; Caterpillar Reply at 85-90.

The evidence shows that the PM620 includes left front, right front, left rear, and right rear caterpillars. *See* CX-0004C (Lumkes WS) at Q/A 244; CX-0986C (CAT PM620 photo 4); CX-0061C.0531-0532 (PM620 Parts Manual); CX-0069.0481 (PM620 Parts Manual). Accordingly, the administrative law judge has determined that the PM620 includes the four caterpillars recited in limitation 26[b].

- d) ***26[c] a first working cylinder rigidly connected to the chassis and connected to the left front wheel or caterpillar for adjusting a height of the left front wheel or caterpillar relative to the chassis; a second working cylinder rigidly connected to the chassis and connected to the right front wheel or caterpillar for adjusting a height of the right front wheel or caterpillar relative to the chassis; a third working cylinder rigidly connected to the chassis and connected to the left rear wheel or caterpillar for adjusting a height of the left rear wheel or caterpillar relative to the chassis; a fourth working cylinder rigidly connected to the chassis and connected to the right rear wheel or caterpillar for adjusting a height of the right rear wheel or caterpillar relative to the chassis;***

Wirtgen argues, in part, that “includes four working cylinders, each rigidly connected to the chassis and connected to the respective left front, right front, left rear, and right rear caterpillars for adjusting the height of the respective caterpillar, as recited in element 26[c].” *See*

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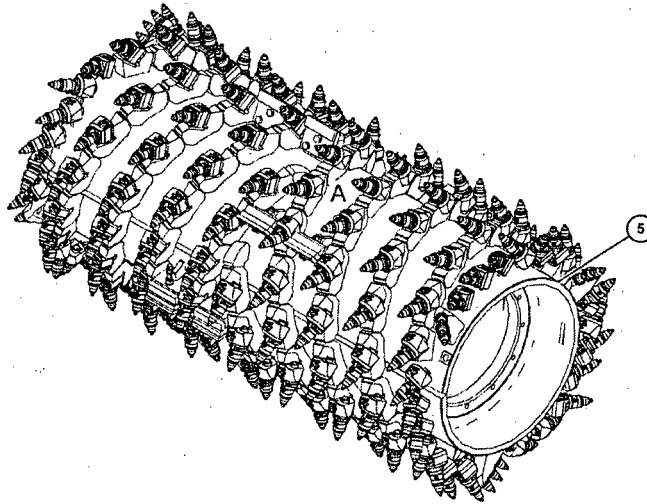
Wirtgen Br. at 210. Caterpillar does not dispute that the PM620 includes these cylinders. *See generally* Caterpillar Br. at 266-78; Caterpillar Reply at 85-90.

The evidence shows that the PM620 includes four hydraulic cylinders, each rigidly connected to the chassis and connected to the respective left front, right front, left rear, and right rear caterpillars for adjusting the height of the respective caterpillar. *See* CX-0004C (Lumkes WS) at Q/A 245-47; CDX-0001C.104 (annotating CX-0061C (PM620 Parts Manual) at 558). Accordingly, the administrative law judge has determined that the PM620 includes the four working cylinders recited in limitation 26[c].

- e) ***26[d] a rotating working roller or rotor supported from the chassis between the front wheels or caterpillars and the rear wheels or caterpillars and extending transversely to the forward direction;***

Wirtgen argues the PM620 includes a milling drum, which is the rotating working roller described in claim 26. *See* Wirtgen Br. at 210. Caterpillar does not dispute that the PM620 includes a rotating working roller. *See generally* Caterpillar Br. at 266-78; Caterpillar Reply at 85-90.

The evidence shows that the PM620 includes a milling drum that is supported from the chassis and positioned between the front and rear caterpillars. *See* CX-0004C (Lumkes WS) at Q/A 248-49; CDX-0001C.105-106 (annotating CX-0061C (PM620 Parts Manual) at 744, 750; CPX-0118 (PM620 CAD)); CX-0118C (PM620 Rotor - 4). A Caterpillar parts manual includes the following image of the milling drum that is used in the PM620:



CX-0061C (PM620 Parts Manual) at 744.

Given the above evidence, the administrative law judge has determined that the PM620 includes a rotating working rotor that is supported from the chassis between the front caterpillars and the rear caterpillars and that extends transversely to the forward direction, as recited in limitation 26[d].

f) 26[e] each of the working cylinders including at least one working chamber filled with a pressure medium; and

Wirtgen argues that the PM620's hydraulic cylinders include a chamber filled with hydraulic oil. *See* Wirtgen Br. at 211-12. Caterpillar does not dispute this. *See generally* Caterpillar Br. at 266-78; Caterpillar Reply at 85-90.

The evidence shows that the PM620's hydraulic cylinders include a chamber that is filled with hydraulic oil. *See* CX-0004C (Lumkes WS) at Q/A 251 ("each leg cylinder is a double-acting cylinder having [

]"); CX-0153C at 18; CX-0153C (PM620 Machine Systems Manual) at 20-21; CX-0591C (PM600 Technical Presentation) at 263. Accordingly, the administrative law judge has

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determined that the PM620's working cylinders include a chamber filled with a pressure medium, as recited in limitation 26[e].

- g) ***26[f] coupling lines connecting the working cylinders to one another and providing a positive hydraulic coupling between the working cylinders in such a way that the left front wheel or caterpillar and the right rear wheel or caterpillar are adjusted in height in the same direction and in the opposite direction to the right front wheel or caterpillar and the left rear wheel or caterpillar.***

Wirtgen argues that the PM620 includes coupling lines that provide positive hydraulic coupling such that the left front and right rear caterpillars move similarly to each other and inversely in relation to the right front and left rear caterpillars. *See* Wirtgen Br. at 212-13. Dr. Lumkes opines that this limitation is met for the same reasons he opined limitations 1[d] and 1[e] were met. *Id.*; *see also* CX-0004C (Lumkes WS) at Q/A 252-53.

Caterpillar argues that Wirtgen “has not shown that this limitation is satisfied” by the PM620 for the same reasons provided with respect to claim 1. *See* Caterpillar Br. at 266; Caterpillar Reply at 85-87.

The administrative law judge has determined that the PM620 includes coupling lines that provide positive coupling as described in limitation 26[f] for the same reasons, and based on the same evidence discussed in relation to limitations 1[d] and 1[e], above. *See* CX-0004C (Lumkes WS) at Q/A 252-53. Accordingly, the administrative law judge finds that the PM620 includes the coupling lines and functionality recited in limitation 26[f].

Thus, in summary, the PM620 infringes claim 26.

5. Claim 29

Claim 29 requires the road-building machine of claim 26 to have “a four sided stability pattern having a widest transverse dimension, transverse to the forward direction of the chassis,

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which widest transverse dimension falls within a footprint of the working roller or rotor.” JX-0005 at 14:32-36.

Wirtgen argues as follows:

Turning to features claim 29, the PM620 has a four-sided stability pattern having a widest transverse dimension that (1) is transverse to the forward direction of the chassis and (2) falls within a footprint of the working rotor when the PM620 ride control feature is active. CX-0004C Q254-56 (Lumkes Opening WS); CPX-0118C (PM620 CAD). The resulting diamond shaped stability pattern is shown below in blue.

[

– Figure omitted –

]

CPX-0118C (PM620 CAD) (annotated). The widest-transverse dimension is annotated with the blue dashed line, which falls within the footprint of the rotor as shown. CX-0004C Q256 (Lumkes Opening WS); CDX-0001C.0114 (Lumkes Direct Demonstrative).

As Dr. Lumkes explains in Q256-258, the left front track and the left rear track move as if they were [], and the left front track and the right front track move as if they were []. See also CDX-0001C.0113 (Lumkes Direct Demonstrative). Likewise, the right front track and right rear track move as if they were [], and the right rear track and left rear track move as if they were []. The pivot points of these []

These imaginary pivot points define the vertices of the resulting diamond-shaped stability pattern. Because the tracks move in equal magnitudes, []

[]. CX-0004C Q258 (Lumkes Opening WS). This results in the stability pattern shown above.

The resulting PM620 stability pattern, when ride control is activated, is substantially similar to the stability pattern, defined by points A-B-C-D in an illustrated embodiment of the ‘309 patent.

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Caterpillar does not dispute that the PM620 has this stability pattern when ride control is activated. Rather, they simply rely on the argument that the PM620 does not have the recited positive coupling in claim 26, from which claim 29 depends.

Wirtgen Br. at 213-15.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 266-78 (claim 29 is not contested); Caterpillar Reply at 85-90 (same).

The evidence shows that the PM620 has a four-sided stability pattern where the widest transverse dimension is transverse to the forward direction of the chassis and also falls within the footprint of the working roller. *See* CX-0004C (Lumkes WS) at Q/A 254-64. Caterpillar's expert, Dr. Alleyne, did not offer an opinion that is specific to claim 29. *See* RX-0991C (Alleyne RWS) at Q/A 337 (Dr. Alleyne testified that "[b]ased on my opinion that Dr. Lumkes has not demonstrated that claims 1 and 26 are infringed by the accused PM600 and PM800 machines, it is my opinion that there is also no infringement of dependent claims 10, 29, and 36."). Accordingly, the administrative law judge has determined that the PM620 has the four-sided stability pattern recited in claim 29, and thus infringes claim 29.

6. Claim 35

Claim 35 requires that the road-building machine of claim 26 further include "a pressure medium source; at least one working line connecting the pressure medium source to at least one of the coupling lines; and at least one control valve disposed in the at least one working line, the control valve having a first position in which the positive hydraulic coupling between the working cylinders is temporarily cancelled, and having a second position in which the positive hydraulic coupling is restored." JX-0005 at 14:57-67.

Wirtgen argues:

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The PM620 further includes the recited pressure medium source, working lines, and control valves as recited in claims 35 and 36 (which depends from claim 35). As shown in the below annotated CX-0591C.0263 (PM600 Technical Presentation), the PM620's hydraulic system includes hydraulic lines (red and green lines) that [] (i.e., a pressure medium source) []

].

[.

– Figure omitted –

]

CX-0591C.0263 (PM600 Technical Presentation) (annotated); *see also* CX-0152C.0008 (PM620,622 Electronic Systems); CX-0153C.0005, .0011, .0014, .0020, .0029-0030, .0048 (PM620 Systems Manual); CDX-0001C.0116 (Lumkes Direct Demonstrative). [] in red and green constitute the recited working lines of claim 35. CX-0004C Q269 (Lumkes Opening WS); *see also* CX-0591C.0263 (PM600 Technical Presentation); CX-0152C.0008 (PM620,622 Electronic Systems); CX-0153C.0005, .0011, .0014, .0020, .0029-0030, .0048 (PM620 Systems Manual). Flow through these lines is controlled [], which are annotated in purple in the above image. *See* CX-0004C Q271 (Lumkes Opening WS); CX-0591C.0263 (PM600 Technical Presentation); CX-0152C.0008 (PM620,622 Electronic Systems); CX-0153C.0005, .0011, .0014, .0020, .0029-0030, .0048 (PM620 Systems Manual); CDX-0001C.0118 (Lumkes Direct Demonstrative). These control valves have second configuration (i.e., a first position) []

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] CX-0004C Q274-75 (Lumkes Opening WS); CX-0591C.0263 (PM600 Technical Presentation); CX-0152C.0008 (PM620, 622 Electronic Systems); CX-0153C.0005, .0011, .0014, .0020, .0029-0030, .0048 (PM620 Systems Manual); CDX-0001C.0119 (Lumkes Direct Demonstrative). These control valves have a second configuration (*i.e.*, a second position) when ride control is re-activated—the hydraulic cylinders are positively coupled via the coupling lines connecting the cylinders together. CX-0004C Q272, 276 (Lumkes Opening WS); CX-0591C.0263 (PM600 Technical Presentation); CX-0152C.0008 (PM620, 622 Electronic Systems); CX-0153C.0005, .0011, .0014, .0020, .0029-0030, .0048 (PM620 Systems Manual).

Wirtgen Br. at 215-17.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 266-78 (claim 35 is not contested); Caterpillar Reply at 85-90 (same).

The evidence shows that the PM620 includes a hydraulic pump, hydraulic lines that connect the hydraulic pump to coupling lines, and control valves in the hydraulic line. *See* CX-0004C (Lumkes WS) at Q/A 267-70, 277; CDX-0001C.116-17 (annotating CX-0591C.0263 (PM600 Technical Presentation)). Thus, the PM620 includes a “pressure medium source; at least one working line connecting the pressure medium source to at least one of the coupling lines; and at least one control valve disposed in the at least one working line.”

The evidence also shows that the PM620’s control valves can [

] *See* CX-0004C (Lumkes WS) at Q/A 271-78; CDX-0001C.118-19 (annotating CX-0591C (PM600 Technical Presentation) at 261). For example, the system is [

] *Id.*

Thus, the PM620’s working valves “hav[e] a first position in which the positive hydraulic

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coupling between the working cylinders is temporarily cancelled, and hav[e] a second position in which the positive hydraulic coupling is restored.”

Accordingly, the administrative law judge has determined that the PM620 infringes claim 35.

7. Claim 36

Claim 36 requires that the working line and control valve from claim 35 “are arranged so that an individual one of the wheels or caterpillars is raised in a first operating mode and is lowered in a second operating mode.” JX-0005 at 15:1-5.

Wirtgen argues:

Turning to the features of claim 36, the working lines and control valves of the PM620 identified for claim 35 are also configured

[

].

[

– Figure omitted –

]

CX-0591C.0293 (PM600 Technical Presentation) (annotated); *see also* CX-0068.0047 (PM620 and PM622 Cold Planers Machine System); CX-0068.0046 (PM620 and PM622 Cold Planers Machine System); JX-0030C at 123:6-126:12 (O’Donnell Dep. Tr.). Referencing the [] shown at CX-0591C.0260-0261 (PM600 Technical Presentation), the [

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J. CX-0004C Q280 (Lumkes Opening WS); CDX-0001C.0120-122 (Lumkes Direct Demonstrative). Notably, Caterpillar does not contest that the PM620 includes the features of claims 35 and 36.

Wirtgen Br. at 217-18.

Caterpillar argues that Wirtgen has not shown infringement under its construction (which treats the entire claim as a functional claim subject to § 112, ¶ 6). *See* Caterpillar Br. at 274.

Caterpillar then argues, in part:

Even under Wirtgen's construction, Wirtgen has failed to show that this limitation is met by the PM600 and PM800 machines. RX0991C at Q/A 370-72. This limitation requires actuating members that are "positively coupled," as recited in claim 26, from which claim 36 depends. Thus, the function recited in claim 36 must be accomplished while being positively coupled, as required by claim 26. For instance, as shown in RDX-0007C.72 (Alleyne Rebuttal Demonstrative), Figure 3 of the '309 patent shows a valve control that performs the associated functionality while maintaining positive hydraulic coupling.

Dr. Lumkes has failed to show that the PM600 and PM800 have actuating members that are positively coupled while "an individual wheel is raised in a first operating mode and is lowered in a second operating mode." RX-0991C at Q/A 371. In fact, the PM600 and PM800 machines cannot accomplish this task while being positively coupled. Instead, to accomplish this motion, [

] This is explained in RX-0157C.0245, which states that [“
,”] and at RX-0157C.0263, which states that [“

.”] Thus, the PM600 and PM800 machines cannot raise and lower individual legs while maintaining positive coupling, and Wirtgen does not contend otherwise. Accordingly, Wirtgen has failed to show that claim 36 is infringed, even under Wirtgen's proposed construction.

Caterpillar Br. at 275.

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The evidence shows that the PM620's hydraulic lines and control valves are arranged such that an individual front caterpillar can be raised and lowered. *See* CX-0004C (Lumkes WS) at Q/A 279-84; CPX-0080C (PM620 Video Raising & Lowering); CX-0591C (PM600 Technical Presentation) at 193, 260-61. Caterpillar's argument improperly imposes a requirement that the machine utilize positive coupling while raising or lowering a caterpillar. *See, e.g.,* RX-0991C (Alleyne RWS) at Q/A 371 ("Dr. Lumkes has failed to show that the PM600 and PM800 have actuating members that are positively coupled while 'an individual wheel is raised in a first operating mode and is lowered in a second operating mode.'").

Accordingly, the administrative law judge has determined that the PM620 infringes claim 36.

8. The 2018 Product Updates

Caterpillar argues, in part:

Relevant to the '309 patent, [] 2018 Product Update Machines. Specifically, the hydraulic schematics, RX-0724C (2018 Model Schematic/Drawing-6) and RX-0723C (2018 Model Schematic/Drawing-5), show []. Referring to RDX-0007C.76 (Alleyne Rebuttal Demonstrative), which includes annotated RX-0724C and RX-0723C, []

[]. First, the

[]. *See* RX-0991C at Q/A 386 (referring to RX-0723C and RX-0724C at elements 18, 19, and 20). Second, the []

[]. *Id.* (referring to RX-0724C at element 9 and RX-0719C (2018 Model Schematic/Drawing-1) at part 9).

Third, []. *Id.* (referring to RX-0747C through RX-0760C). Fourth, []

[]. *Id.* (referring to RX-0761C, RX-0762C, RX-0769C, RX-0770C, RX-0773C, RX-0776C, RX-0783C, and RX-0791C).

Collectively, these changes []

[]. In other words, the 2018 Product Update Machines are

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[]. RX-0991C (Alleyne Rebuttal Witness Statement) at Q/A 387; *compare* RDX-0007C.77 with RDX-0007C.78 (Alleyne Rebuttal Demonstrative). And as explained above, this design change []. See JX-0025C (Healy Dep. Tr.) at 166:2-4; 161:18-162:4. As explained below, the 2018 Product Update Machines do not infringe any asserted claims of the '309 patent, and Wirtgen does not contend otherwise.

Caterpillar Br. at 276-77.

The administrative law judge previously determined that the 2018 Product Updates are not finalized. See Part II(C)(4), *supra*. Caterpillar's non-infringement arguments and the evidence cited therein shows that the 2018 Product Updates have not been finalized. See Caterpillar Br. at 276 ("the accused "ride control" feature [] 2018 Product Update Machines" (emphasis added)); see also RX-0991C (Alleyne RWS) at Q/A 389 ("... the ride control feature [] PM600 and PM800 machines with the 2018 Product Updates []." (emphasis added)); RX-0993C (Engelmann RWS) at Q/A 20 (explaining the designs are ["] and that a ["] (emphasis added)) and Q/A 24 (explaining that the designs [] given component sourcing lead times); *Certain Digital Video Receivers and Hardware and Software Components Thereof*, Inv. No. 337-TA-1001, Comm'n Op. at 22-24 (Dec. 6, 2017) (vacating a portion of an ID as to "alternative designs" that were "too speculative to adjudicate at this time"). Accordingly, as the 2018 Product Updates are not final, the administrative law judge declines to adjudicate them. See *Certain Digital Video Receivers*.

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D. Domestic Industry (Technical Prong)

Wirtgen argues that “the W150CFi is representative of the W150i, and the W210i is representative of the W200i, W220, W220i, and W250i, for purposes of the domestic-industry analysis of the ‘309 patent.” Wirtgen Br. at 218 (citing JX-0017C (Representative Accused Products Stipulation); CX-0010C (Allen WS) at Q/A 39-43, 50-52). Wirtgen argues that the W150CFi and the W210i practice claims 10 and 29.

Caterpillar’s entire domestic industry argument for the ‘309 Patent follows:

Wirtgen contends that its representative products—the W210i and W150CFi—meet each limitation of claims 10 and 29 of the ‘309 patent. But Wirtgen has failed to carry its burden. First, as explained above, each of these claims is invalid as obvious and therefore cannot serve as the basis for demonstrating the technical prong of the domestic industry requirement. Second, Wirtgen has failed to show that the alleged D.I. products—the W210i and W150CFi—practice each and every limitation of claims 10 and 29 of the ‘309 patent.

1. **Claims 10 and 29: “positively coupled to one another in such a way that the left front wheel or caterpillar and the right rear wheel or caterpillar [can be] [are] adjusted in height in the same direction and in the opposite direction to the right front wheel or caterpillar and the left rear wheel or caterpillar”**

As explained above, all of the asserted domestic industry claims require the dual capability illustrated in Figure 5 of the ‘309 patent, *i.e.*, the ability to adjust “the left front wheel or caterpillar and the right rear wheel or caterpillar . . . in the same direction and in the opposite direction to the right front wheel or caterpillar and the left rear wheel or caterpillar.” As explained above, this dual capability is required under both parties’ constructions. Wirtgen has failed to show that this requirement is satisfied by the W210i and W150CFi machines. RX-0991C (Alleyne Rebuttal Witness Statement) at Q/A 417-428.

In fact, Dr. Lumkes does not even attempt to address whether the W210i and W150CFi machines practice this limitation under Caterpillar’s proposed construction. RX-0991C at Q/A 422. Thus, if the ALJ adopts Caterpillar’s proposed claim construction, Wirtgen cannot meet its burden of showing a technical domestic

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industry because Dr. Alleyne's technical domestic industry testimony under Caterpillar's proposed construction was un rebutted by Dr. Lumkes or Wirtgen. Nor does Dr. Lumkes address whether the W210i and W150CFi machines have the dual capability required by all the claims and exemplified by Figure 5 of the '309 patent. Id. For this reason alone, Wirtgen has failed to meet its burden of proof to show that it has a technical domestic industry in the '309 patent.

Caterpillar Br. at 278-79 (heading repeating the "positively coupled to . . ." limitation omitted).

Wirtgen's and Caterpillar's arguments are addressed below.

1. Claim 1

a) *1[p] 1. A road-building machine*

Wirtgen argues that the W150CFi and the W210i are road-building machines. See Wirtgen Br. at 218.

The evidence shows that the W150CFi and the W210i are road-building machines. See CX-0004C (Lumkes WS) at Q/A 287. Accordingly, the administrative law judge has determined that the W150CFi and the W210i are road-building machines, as the preamble describes.

b) *1[a] of which a left front wheel or caterpillar, right front wheel or caterpillar, left rear wheel or caterpillar and right rear wheel or caterpillar is connected to a chassis of the road-building machine*

Wirtgen argues that the W150CFi and the W210i include four crawlers (caterpillars) as described in limitation 1[a]. See Wirtgen Br. at 218-19.

The evidence shows that the W150CFi and the W210i each has a left front caterpillar, right front caterpillar, left rear caterpillar, and a right rear caterpillar, which are connected to a chassis via four adjustable-height legs. See CX-0004C (Lumkes WS) at Q/A 288-89. Accordingly, the administrative law judge has determined that the W150CFi and the W210i each has four caterpillars and a chassis, as limitation 1[a] requires.

c) *1[b] by means of an actuating member and is adjustable in height with respect to a frame of the road-building machine, the*

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individual actuating members being connected rigidly to the chassis

Wirtgen argues that the W150CFi and the W210i each includes four actuating members as described in limitation 1[b]. See Wirtgen Br. at 219-20.

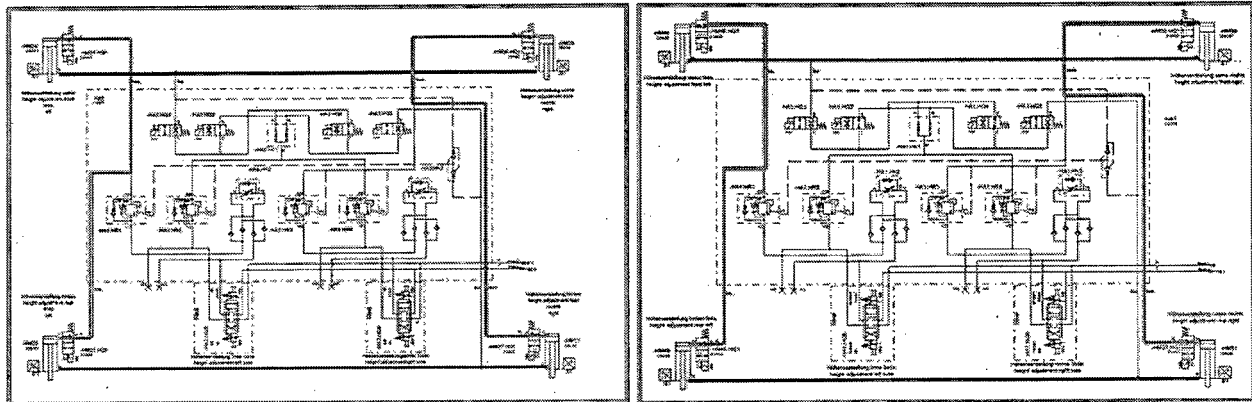
The evidence shows that the W150CFi and the W210i each includes four crawlers that are connected to a chassis via height-adjustable legs, which include hydraulic cylinders (*i.e.*, actuating members). See CX-0004C (Lumkes WS) at Q/A 290-92. Bolts and welding secure the hydraulic cylinders to the chassis. *Id.* at Q/A 292. Accordingly, the administrative law judge has determined that the W150CFi and the W210i each includes legs with height-adjustable actuating members that are rigidly connected to the chassis, as limitation 1[b] requires.

- d) ***1[c] being positively coupled to one another in such a way that the left front wheel or caterpillar and the right rear wheel or caterpillar can be adjusted in height in the same direction and in the opposite direction to the right front wheel or caterpillar and the left rear wheel or caterpillar***

Wirtgen argues:

Under the proper claim construction, the hydraulic system of the W210i and W150CFi also practices element 1[c]. As Wirtgen America's proposed construction provides, "the left front wheel or caterpillar and the right rear wheel or caterpillar can be adjusted in height in the same direction [to each other] and in the opposite direction to the right front wheel or caterpillar and the left rear wheel or caterpillar," means "the left front wheel or caterpillar and the right rear wheel or caterpillar can be adjusted in height similarly [to each other] and inversely to the left front wheel or caterpillar and the left rear wheel or caterpillar." Except when a raising or lowering command is being executed, the W210i's and W150CFi's hydraulic leg cylinders are positively coupled in series to one another such that movement of one hydraulic cylinder causes another hydraulic cylinder to move. CX-0177.0011 (W210i Hydraulic Diagram); CX-0196.0009 (W150CFi Hydraulic Diagram). These hydraulic configurations for both the W210i and W150CFi are shown below.

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CX-0177.0011 (W210i Hydraulic Diagram) (annotated); CX-0196.0009 (W150CFi Hydraulic Diagram) (annotated). In this configuration for both machines, the rod-end chamber of the left front cylinder is connected to the rod-end chamber of the right front hydraulic cylinder, and the head-end chamber of the left front cylinder is connected to the head-end chamber of the left rear cylinder. CX-0004C Q295 (Lumkes Opening WS); CDX-0001C.0133, .0135 (Lumkes Direct Demonstrative). The rod-end chamber of the right rear cylinder is connected to the rod-end chamber of the left rear hydraulic cylinder, and the head-end chamber of the left rear cylinder is connected to the head-end chamber of the left front cylinder. Id. Accordingly, extension of the right front piston causes the hydraulic fluid in the rod-end of the right front cylinder to move towards the rod-end of the left front cylinder, filling the volume vacated by the left front piston that retracted when it encounters, for example, a raised obstacle in the road. CDX-0007 1:15-1:40 (Four-way Full Float Animation – Lumkes); CX-0010C (Allen WS) Q38. Both the left front piston and the right rear piston retract (moves up), and the right front piston and the left rear piston extend (moves down). The W210i and W150CFi's left front track and the right rear track are therefore adjusted in height similarly to each other and inversely to the right front track and the left rear track, as recited in claim 1[c]. CX-0004C Q298 (Lumkes Opening WS); CDX-0001C.0134 (Lumkes Direct Demonstrative).

Wirtgen Br. at 220-21.

Caterpillar argues that the W150CFi and the W210i do not have “the dual capability illustrated in Figure 5 of the ‘309 patent, *i.e.*, the ability to adjust ‘the left front wheel or caterpillar and the right rear wheel or caterpillar . . . in the same direction and in the opposite

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direction to the right front wheel or caterpillar and the left rear wheel or caterpillar.” Caterpillar Br. at 279; *see also* RX-0991C (Alleyne RWS) at Q/A 423-28 (adopting Caterpillar’s argument); Caterpillar Reply at 90-91 (presenting essentially the same argument).

Having considered the parties’ arguments, the administrative law judge has determined that the evidence shows that the W150CFi and the W210i each includes four leg cylinders that are positively coupled to one another such that the left front caterpillar and the right rear caterpillar can be adjusted in height similarly and inversely in relation to the right front caterpillar and the left rear caterpillar. Dr. Lumkes described how the W150CFi and the W210i operate and opined that the machines satisfied limitation 1[c]. *See* CX-0004C (Lumkes WS) at Q/A 293-98; *see also* RX-0991C (Alleyne RWS) at Q/A 432 (Dr. Alleyne explains he “do[es] not disagree with Dr. Lumkes’ general description” of the Wirtgen machines). Dr. Alleyne, on the other hand, opines that Dr. Lumkes has not shown that the Wirtgen machines satisfy the limitation under Caterpillar’s construction or under Dr. Alleyne’s interpretation of Wirtgen’s construction. *See* RX-0991C (Alleyne RWS) at Q/A 425-26. As Dr. Lumkes explained, the arrangement of the Wirtgen machines’ hydraulic systems allows the left front piston and the right rear piston to retract (move up) and the right front piston and the left rear piston to extend (move down). CX-0004C (Lumkes WS) at Q/A 295-98.²⁷

²⁷ In Q/A 296, Dr. Lumkes explained:

Q. Can you explain what happens if the left front 296[] crawler unit runs over a raised obstacle while in the configuration you just described?

A. The left front piston would retract (moves up), causing the hydraulic fluid in the head-end of the left front cylinder to travel towards the head-end of the left rear cylinder which in turn causes the left rear piston to extend (move down). At the same time, extension of the left rear piston causes the hydraulic fluid in the rod-end of the left rear cylinder to move towards the rod-end of the right

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Thus, the W150CFi and the W210i each includes four leg cylinders that are positively coupled to one another such that the left front caterpillar and the right rear caterpillar can be adjusted in height similarly and inversely in relation to the right front caterpillar and the left rear caterpillar, as limitation 1[c] requires.

- e) ***1[d] the actuating members being designed as double-acting working cylinders with a first and a second working chamber which are filled with a pressure medium***

Wirtgen argues that the W150CFi and the W210i's hydraulic leg cylinders are double-acting working cylinders, and that the cylinders have two chambers that are filled with a pressure medium, namely hydraulic oil. *See* Wirtgen Br. at 221-22.

The evidence shows that the W150CFi and the W210i's hydraulic leg cylinders are double-acting working cylinders with a first and a second working chamber that are filled with a pressure medium, as limitation 1[d] requires. *See* CX-0004C (Lumkes WS) at Q/A 299-301. Accordingly, the administrative law judge has determined that the W150CFi and the W210i's hydraulic leg cylinders constitute the actuating members recited in limitation 1[d].

rear cylinder, causing the right rear piston to retract (move up). At the same time, retraction of the right rear piston causes the hydraulic fluid in the head-end of the right rear cylinder to move towards the head-end of the right front cylinder, causing the right front piston to extend (move down). At the same, extension of the right front piston causes the hydraulic fluid in the rod-end of the right front cylinder to move towards the rod-end of the left front cylinder, filling the volume vacated by the left front piston that retracted when it encountered the raised obstacle. This is illustrated in the demonstrative animation CDX-0007 at 1:15-1:40.

CX-0004C (Lumkes WS) at Q/A 296.

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f) 1[e] the working cylinders being connected to one another via coupling lines.

Wirtgen argues that the W150CFi and the W210i include coupling lines that connect the hydraulic leg cylinders. *See* Wirtgen Br. at 223.

The evidence shows that the W150CFi and the W210i include coupling lines that connect the hydraulic leg cylinders. *See* CX-0004C (Lumkes WS) at Q/A 302-303. Accordingly, the administrative law judge has determined that the W150CFi and the W210i include working cylinders connected via coupling lines, as limitation 1[e] requires.

Thus, in summary, the W150CFi and the W210i practice claim 1.

2. Claim 9

Claim 9 requires that the coupling lines of claim 1 “can be connected to a pressure medium source and/or a pressure medium sump via working lines with the aid of a valve control.” JX-0005 at 12:46-49.

Wirtgen argues that the W150CFi and the W210i are each connected to a pump via working lines “with the aid of a valve control[.]” *See* Wirtgen Br. at 224.

The evidence shows that the W150CFi and the W210i include a pump, working lines, and a value control, as described in claim 9. *See* CX-0004C (Lumkes WS) at Q/A 304-11. Accordingly, the administrative law judge has determined that the W150CFi and the W210i practice claim 9.

3. Claim 10

Claim 10 requires that the valve control of claim 9 is configured such that “all the wheels are raised in a first operating mode and are lowered in a second operating mode, this taking place in each case by the same amount.” JX-0005 at 12:50-54.

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Wirtgen argues that the W150CFi and the W210i each can raise or lower all wheels at the same time. *See* Wirtgen Br. at 225 (“Valve control is configured to raise all the wheels in a first operating mode and lower all wheels a second operating mode, the raising and lowering taking place in each case by the same amount as recited in dependent claim 10.”).

Caterpillar argues that the Wirtgen machines do not practice claim 10 because they lack wheels. *See* Caterpillar Reply at 91.

The evidence shows that the W150CFi and the W210i lack the wheels that claim 10 requires. *See* RX-0991C (Alleyne Rebuttal Witness Statement) at Q/A 431-32, 437.

Accordingly, the administrative law judge has determined that the W150CFi and the W210i do not practice claim 10.

4. Claim 26

Wirtgen argues that the “W210i and W150CFi also meet all of the limitations of claim 26 and claim 29.” Wirtgen Br. at 226.

Caterpillar argues that the Wirtgen machines do not practice claim 26 because they do not satisfy the “positively coupled . . .” limitation, *i.e.*, limitation 26[f]. *See* Caterpillar Br. at 279; RX-0991C (Alleyne RWS) at Q/A 418 (“In my opinion, Wirtgen has not shown that the W210i and W150CFi have actuating members that are “positively coupled . . .” as required by claims 1 and 26.”).

Wirtgen’s and Caterpillar’s arguments are addressed below.

a) 26[p] 26. A road-building machine, comprising:

Wirtgen argues that the W150CFi and the W210i are road-building machines. *See* Wirtgen Br. at 226.

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The evidence shows that the W150CFi and the W210i are road-building machines. See CX-0004C (Lumkes WS) at Q/A 287, 320. Accordingly, the administrative law judge has determined that the W150CFi and the W210i are road-building machines, as the preamble describes.

b) 26[a] a chassis having a forward direction;

Wirtgen argues the W150CFi and the W210i each includes a chassis having a forward direction. See Wirtgen Br. at 226.

The evidence shows that the W150CFi and the W210i each includes a chassis having a forward direction. See CX-0004C (Lumkes WS) at Q/A 321. Accordingly, the administrative law judge has determined that the W150CFi and the W210i each includes a chassis having a forward direction, as limitation 26[a] recites.

c) 26[b] a left front wheel or caterpillar; a right front wheel or caterpillar; a left rear wheel or caterpillar; a right rear wheel or caterpillar;

Wirtgen argues the W150CFi and the W210i each includes left front, right front, left rear, and right rear caterpillars. See Wirtgen Br. at 225.

The evidence shows that the W150CFi and the W210i each includes left front, right front, left rear, and right rear caterpillars. See CX-0004C (Lumkes WS) at Q/A 322. Accordingly, the administrative law judge has determined that the W150CFi and the W210i each includes the four caterpillars recited in limitation 26[b].

d) 26[c] a first working cylinder rigidly connected to the chassis and connected to the left front wheel or caterpillar for adjusting a height of the left front wheel or caterpillar relative to the chassis; a second working cylinder rigidly connected to the chassis and connected to the right front wheel or caterpillar for adjusting a height of the right front wheel or caterpillar relative to the chassis; a third working cylinder rigidly connected to the chassis and connected to the left rear wheel or caterpillar for adjusting a

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height of the left rear wheel or caterpillar relative to the chassis; a fourth working cylinder rigidly connected to the chassis and connected to the right rear wheel or caterpillar for adjusting a height of the right rear wheel or caterpillar relative to the chassis;

Wirtgen argues, in part, that the W150CFi and the W210i each includes “four working cylinders, each rigidly connected to the chassis and connected to the respective caterpillar for adjusting the height of the respective caterpillar, as recited in element 26[c].” See Wirtgen Br. at 226.

The evidence shows that the W150CFi and the W210i each includes four hydraulic cylinders, each rigidly connected to the chassis and connected to the respective left front, right front, left rear, and right rear caterpillars for adjusting the height of the respective caterpillar. See CX-0004C (Lumkes WS) at Q/A 323-25. Accordingly, the administrative law judge has determined that the W150CFi and the W210i each includes the four working cylinders recited in limitation 26[c].

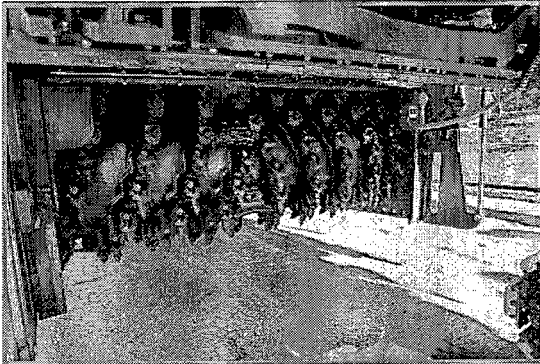
- e) ***26[d] a rotating working roller or rotor supported from the chassis between the front wheels or caterpillars and the rear wheels or caterpillars and extending transversely to the forward direction;***

Wirtgen argues the W150CFi and the W210i each includes a “rotating working rotor,” which is the rotating working roller described in claim 26. See Wirtgen Br. at 226.

The evidence shows that the W150CFi and the W210i each includes a milling drum (*i.e.*, a rotating working rotor) that is supported from the chassis and positioned between the front and rear caterpillars. See CX-0004C (Lumkes WS) at Q/A 326-28. Dr. Lumkes’s demonstrative slides show the rotors as follows:

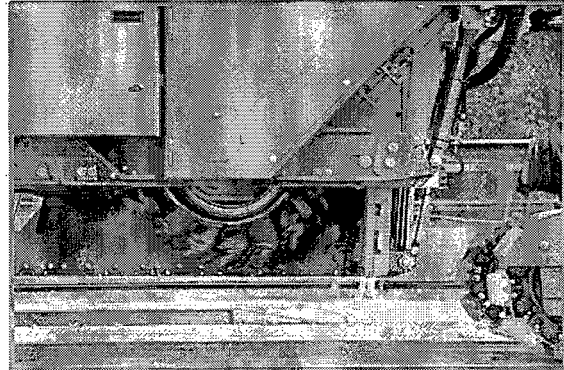
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Wirtgen W210i



CX-0210.0005 (W210i photos - 2)

Wirtgen W150CFi



CX-0204.0025 (Representative DI Photos - 4)

CDX-0001C (Lumkes Demonstrative) at 154-55.

Given the above evidence, the administrative law judge has determined that the W150CFi and the W210i each includes a rotating working rotor that is supported from the chassis between the front caterpillars and the rear caterpillars and that extends transversely to the forward direction, as recited in element 26[d].

- f) 26[e] each of the working cylinders including at least one working chamber filled with a pressure medium; and*

Wirtgen argues that the hydraulic cylinders in the W150CFi and the W210i include two chambers filled with hydraulic fluid. *See* Wirtgen Br. at 226.

The evidence shows that the hydraulic cylinders in the W150CFi and the W210i include two chambers filled with hydraulic fluid. *See* CX-0004C (Lumkes WS) at Q/A 329-30.

Accordingly, the administrative law judge has determined that the W150CFi and the W210i include “working cylinders including at least one working chamber filled with a pressure medium,” as recited in limitation 26[e].

- g) 26[f] coupling lines connecting the working cylinders to one another and providing a positive hydraulic coupling between the working cylinders in such a way that the left front wheel or caterpillar and the right rear wheel or caterpillar are adjusted in*

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height in the same direction and in the opposite direction to the right front wheel or caterpillar and the left rear wheel or caterpillar.

Wirtgen argues that the W150CFi and the W210i each includes coupling lines that provide positive hydraulic coupling such that the left front and right rear caterpillars move similarly to each other and inversely in relation to the right front and left rear caterpillars. *See* Wirtgen Br. at 226-27. Dr. Lumkes opines that this limitation is met for the same reasons he opined limitations 1[d] and 1[e] were met. *Id.*; *see also* CX-0004C (Lumkes WS) at Q/A 331.

Caterpillar and its expert, Dr. Alleyne, do not present a separate argument from the “positively coupled” aspect of claim 1. *See* Caterpillar Br. at 278-79; RX-0991C (Alleyne RWS) at Q/A 418.

The administrative law judge has determined that the W150CFi and the W210i each includes coupling lines that provide positive coupling as described in limitation 26[f] for the same reasons, and based on the same evidence discussed in relation to limitations 1[d] and 1[e], above. *See* CX-0004C (Lumkes WS) at Q/A 299-303, 331-33. Accordingly, the administrative law judge finds that the W150CFi and the W210i each includes the coupling lines and functionality recited in limitation 26[f].

Thus, in summary, the W150CFi and the W210i practice claim 26.

5. Claim 29

Claim 29 requires the road-building machine of claim 26 to have “a four sided stability pattern having a widest transverse dimension, transverse to the forward direction of the chassis, which widest transverse dimension falls within a footprint of the working roller or rotor.” JX-0005 at 14:32-36.

Wirtgen argues as follows:

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The W210i and W150CFi also have a four-sided stability pattern having a widest transverse dimension, transverse to the forward direction of the chassis, that falls within a footprint of the working rotor as recited in claim 29. When the ride control feature is activated, the four leg cylinders of the W210i and W150CFi are positively coupled together such that the left front track and the left rear track move as they were on an imaginary pivoting axle, and the left front track and the right front track move as they were on an imaginary pivoting axle, and so on. The pivoting point of these imaginary axes is located along the line between adjacent pairs of tracks. These imaginary pivot points define the vertices of the resulting stability pattern. CX-0004C Q337 (Lumkes Opening WS). The resulting stability pattern of the W210i and W150CFi is a four-sided diamond shape. CX-0004C Q342 (Lumkes Opening WS); CDX-0001C.0161 (Lumkes Direct Demonstrative). The widest transverse dimensions of the stability patterns for both W210i and W150CFi is located within the foot print of the W210i and W150CFi working rotors. CX-0004C Q343 (Lumkes Opening WS); CDX-0001C.0161-162 (Lumkes Direct Demonstrative).

Wirtgen Br. at 227.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 278-79 (claim 29 is not contested); Caterpillar Reply at 90-91 (same).

The evidence shows that the W150CFi and the W210i each has a four-sided stability pattern where the widest transverse dimension is transverse to the forward direction of the chassis and also falls within the footprint of the working roller. *See* CX-0004C (Lumkes WS) at Q/A 334-343. Caterpillar's expert, Dr. Alleyne, did not offer an opinion that is specific to claim 29. *See* RX-0991C (Alleyne RWS) at Q/A 430 (Dr. Alleyne testified that "[b]ased on my opinion that Dr. Lumkes has not demonstrated that claims 1 and 26 are practiced by the W210i and W150CFi, it is my opinion that the W210i and W150CFi also do not practice dependent claims 10 and 29."). Accordingly, the administrative law judge has determined that the W150CFi and the W210i each has the four-sided stability pattern recited in claim 29, and thus practice claim 29.

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E. Obviousness – Swisher and Neumeier

Caterpillar argues that “asserted claims 10 and 29 are obvious over the combination of Swisher and Neumeier[.]” Caterpillar Br. at 231. Swisher (RX-0021) is U.S. Patent 4,325,580, and Neumeier (RX-0029) is German Patent Publication DE1918393.

Wirtgen argues, in general, that Swisher and Neumeier do not disclose every element of claims 10 and 29 and that a person of skill in the art would not combine the prior art references. *See generally* Wirtgen Br. at 229-59. Wirtgen does not dispute that Swisher or Neumeier are prior art under 35 U.S.C. § 102(b). *Id.*

1. Claim 1

a) *1[p] 1. A road-building machine*

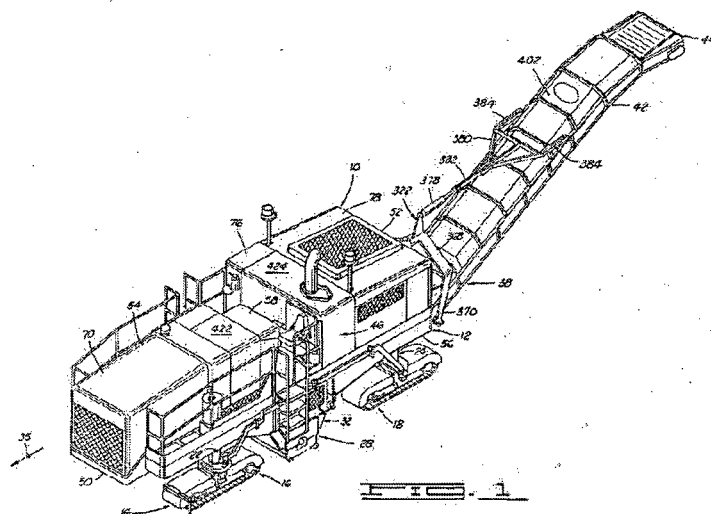
Caterpillar argues that Swisher discloses a road-building machine. *See* Caterpillar Br. at 232 (“Swisher is directed ‘to a planer type road construction apparatus affording precision planing of an existing paved roadway.’”).

Wirtgen concedes that “Swisher is directed to a road milling machine.” Wirtgen Br. at 230.

The evidence shows that Swisher teaches a road-building machine. *See* RX-0021 (Swisher) at Figs. 1-3, Abstract, 1:5-10, 2:33-54; RX-0985C (Alleyne WS) at Q/A 790-91.

Swisher includes the following image of a cold planer:

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RX-0021, Fig. 1. Dr. Lumkes also acknowledged that Swisher and Neumeier teach all of the elements of claim 1:

... When you take those two references together, Swisher and Neumeier, you don't dispute that these references disclose all elements of Claim 1; is that right?

A The elements are disclosed in the combinations of Swisher and Neumeier; correct.

Lumkes Tr. 372. Accordingly, the administrative law judge has determined that Swisher discloses this element of the claimed invention.

b) 1[a] of which a left front wheel or caterpillar, right front wheel or caterpillar, left rear wheel or caterpillar and right rear wheel or caterpillar is connected to a chassis of the road-building machine

Caterpillar argues that Swisher teaches four track and leg assemblies (e.g., caterpillars) that are connected to a chassis, as described in limitation 1[a]. See Caterpillar Br. at 232-33.

Wirtgen does not clearly rebut this argument. See generally Wirtgen Br. at 229-45 (the limitation is not contested); Wirtgen Reply at 77 (same).

The evidence shows that Swisher teaches a road-building machine that includes left front, right front, left rear, and right rear caterpillars, and the caterpillars are connected to a chassis via

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four height-adjustable legs. RX-0021 at 6:40-41; 6:52-57; 9:3-28; Figs. 2-3; 5:40-50; 7:4-8; RX-0985C (Alleyne WS) at Q/A 792-93. Dr. Lumkes also acknowledged that Swisher and Neumeier teach all of the elements of claim 1. *See* Lumkes Tr. 372. Accordingly, the administrative law judge has determined that Swisher discloses this element of the claimed invention.

- c) ***1[b] by means of an actuating member and is adjustable in height with respect to a frame of the road-building machine, the individual actuating members being connected rigidly to the chassis***

Caterpillar argues that Swisher discloses four actuating members as described in limitation 1[b]. *See* Caterpillar Br. at 232-34.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 229-45 (the limitation is not contested); Wirtgen Reply at 77 (same).

The evidence shows that Swisher teaches four caterpillars that are connected to a chassis via extensible and retractable legs, which include hydraulic cylinders (*i.e.*, actuating members). RX-0021 at 7:4-8; 6:40-41; 8:40-45; RX-0985C (Alleyne WS) at Q/A 792-93, 796-98. Dr. Lumkes also acknowledged that Swisher and Neumeier teach all of the elements of claim 1. *See* Lumkes Tr. 372. Accordingly, the administrative law judge has determined that Swisher discloses this element of the claimed invention.

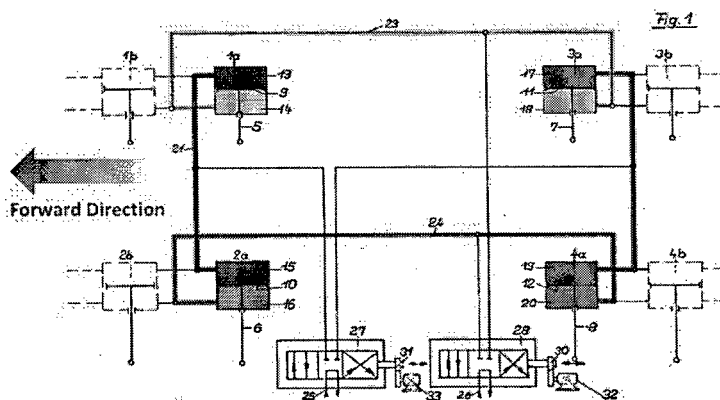
- d) ***1[c] being positively coupled to one another in such a way that the left front wheel or caterpillar and the right rear wheel or caterpillar can be adjusted in height in the same direction and in the opposite direction to the right front wheel or caterpillar and the left rear wheel or caterpillar***

Caterpillar argues that Neumeier teaches positive coupling. *See* Caterpillar Br. at 234 (“Swisher does not disclose positive coupling to achieve the results recited in Element [1.c] . . .

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[but] the combination of Swisher and Neumeier discloses this element of claim 1.”). Caterpillar argues:

Specifically, Neumeier teaches hydraulic cylinders “1a, 2a, 3a and 4a” which “are each subdivided into two chambers.” RX-0029 (Neumeier) at Fig. 1. As shown below in annotated Figure 1, the working cylinders disclosed in Neumeier are connected via coupling lines 21, 22, 23, and 24. RX-0029.0032-33.



RDX-0001.180 (annotated Fig. 1). This is nearly identical to the hydraulic network shown in Figure 1 of the ‘309 patent. See JX-0005 (‘309 Patent) at Fig. 1. Referring to Figure 1 above, Neumeier further explains:

These transverse and longitudinal connections, for example during an upward movement of the piston 9 in the cylinder 1a, cause the piston 10 in the cylinder 2a to move downwardly. At the same time, this, in turn, causes an upward movement of the piston 12 in the cylinder 4a, and a downward movement of the piston 11 in the cylinder 3a. The individual pistons each move downwardly or upwardly by the same magnitude. The amounts of oil displaced in each case are also the same.

RX-0029.0033. Thus, Neumeier teaches the same “positively coupled” function recited in the ‘309 patent. *Id.* Indeed, as Neumeier explains, because of the cross-coupling configuration and resulting piston motion, “wheels located next to and behind one another thus move in *opposite directions*, while diagonally opposing wheels move in the *same direction*.” RX-0029.0033 (emphases added); see also RX-0029.0029 (Neumeier explaining that “hydraulic cylinders are connected to one another by a connection network to allow mutual compensation” (emphasis added)). Thus,

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applying Wirtgen's construction—"adjusted in height similarly and inversely"—Neumeier teaches the same resulting movement of adjacent and diagonally opposite wheels recited in this limitation.²⁸ RX-0985C at Q/A 806.

Caterpillar Br. at 235-36.

Wirtgen argues that Neumeier "does not disclose a milling machine or suggest that its hydraulic system could be used in a milling machine." Wirtgen Br. at 232. Wirtgen does not directly rebut Caterpillar's assertion that Neumeier teaches positive coupling. *See generally id.* at 232-33, 236-37; Wirtgen Reply at 78, 82-83.

Having considered the parties' arguments, the administrative law judge has determined that the evidence shows that Neumeier, but not Swisher, teaches positive coupling. *See* RX-0029 (Neumeier) at 29, 33, Fig. 1; RX-0985C (Alleyne WS) at Q/A 800, 802, 806. Dr. Lumkes also acknowledged that Swisher and Neumeier teach all of the elements of claim 1. *See* Lumkes Tr. 372 (testifying that the "elements are disclosed in the combinations of Swisher and Neumeier"). Accordingly, the administrative law judge has determined that Swisher and Neumeier disclose this element of the claimed invention.

e) ***1[d] the actuating members being designed as double-acting working cylinders with a first and a second working chamber which are filled with a pressure medium***

Caterpillar argues that the "combination of Swisher and Neumeier satisfies Element [1.d], and Wirtgen does not argue otherwise." Caterpillar Br. at 239.

Wirtgen argues that Swisher does not disclose this element, but is silent on Neumeier. *See generally* Wirtgen Br. at 233-34, 236; Wirtgen Reply at 78, 82-83.

²⁸ Under Caterpillar's construction, which requires dual functionality, this limitation would also be met by Neumeier because Neumeier permits "rolling" and "pitching" using positive coupling. *See* RX-0985C at Q/A 809; RX-0021.0035; RDX-0001.182 (Alleyne Demonstrative).

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The evidence shows that Neumeier teaches the use of double-acting working cylinders that include two chambers filled with oil. *See* RX-0029 at 32-33, Fig. 1; RX-0985C (Alleyne WS) at Q/A 810-12. Dr. Lumkes also acknowledged that Swisher and Neumeier teach all of the elements of claim 1. *See* Lumkes Tr. 372. Accordingly, the administrative law judge has determined that Neumeier discloses this element of the claimed invention.

f) 1[e] the working cylinders being connected to one another via coupling lines.

Caterpillar argues that “Neumeier expressly teaches that the chambers of the working cylinders are connected to one another via coupling lines 21, 22, 23 and 24.” Caterpillar Br. at 240.

Wirtgen argues that Swisher does not disclose this element, but is silent on Neumeier. *See generally* Wirtgen Br. at 234, 236; Wirtgen Reply at 78, 82-83.

The evidence shows that Neumeier teaches connecting working cylinder via coupling lines. *See* RX-0029 at 32-33, Fig. 1; RX-0985C (Alleyne WS) at Q/A 814-15. Dr. Lumkes also acknowledged that Swisher and Neumeier teach all of the elements of claim 1. *See* Lumkes Tr. 372. Accordingly, the administrative law judge has determined that Neumeier discloses this element of the claimed invention.

2. Claim 9

Claim 9 requires that the coupling lines of claim 1 “can be connected to a pressure medium source and/or a pressure medium sump via working lines with the aid of a valve control.” JX-0005 at 12:46-49.

Caterpillar argues that the “combination of Swisher as modified by Neumeier in the manner described above satisfies the additional limitation of dependent claim 9.”

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Wirtgen argues that Swisher does not disclose this element, but is silent on Neumeier.

See generally Wirtgen Br. at 234, 236; Wirtgen Reply at 78, 82-83.

The evidence shows that Neumeier teaches a control valve, working lines, and a pump. RX-0029 at 34-35; RX-0985C (Alleyne WS) at Q/A 820-21. Accordingly, the administrative law judge has determined that Neumeier discloses the subject matter claim 9 encapsulates.

3. Claim 10

Claim 10 requires that the valve control of claim 9 is configured such that “all the wheels are raised in a first operating mode and are lowered in a second operating mode, this taking place in each case by the same amount.” JX-0005 at 12:50-54.

Caterpillar argues that “Swisher discloses a conventional grade and slope controller, which commonly included the ability to raise and lower all legs, for instance to avoid obstacles. This is explained above, for instance, with reference to the prior-art PM-465 grade and slope system.” Caterpillar Br. at 244 (citing RX-0021 at 4:30-35, RX-0028.0014 (PM-465 STMG)).²⁹ Caterpillar argues that the “ability to raise and lower all four legs was also desirable for ‘jumping’ over obstacles during milling, as explained in the prior-art PM-465.” *Id.* at 245. For the modification, Caterpillar argues:

Specifically, a POSITA would have been motivated and able to replace valves 27 and 28 of Neumeier with a single valve (*e.g.*, 27). RX-0985C at Q/A 830. For example, supply line 25 could be connected to chambers 13, 15, 17, and 19 of hydraulic cylinders 1a, 2a, 3a, and 4a, respectively and drain line 25 could be connected to chambers 14, 16, 18, and 20 of hydraulic cylinders 1a, 2a, 3a, and 4a, respectively. *Id.* This simple modification would have given the

²⁹ RX-0021 at 4:30-35 provides “By selective orientation of the main frame 12 via the elevation and cross-slope control assemblies, (described more fully in the above mentioned U.S. Pat. No. 4,139,138 [*sic* 4,139,318]), the cutter drum assembly 30 may be oriented so as to cut the roadway surface to coincide with a reference plane of predetermined spatial orientation.”

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Swisher/Neumeier machine the ability to raise or lower all four legs by the same amount. *Id.*

Id. Caterpillar further argues that examples of “the knowledge of a POSITA in 2005 to implement this type of valve control can be found in Mannebach [RX-0034] . . . [and] road milling machines such as the Roadtec RX-500 and Caterpillar PM-465, which included the ability to raise and lower all legs at the same time.” *See id.* at 246. Caterpillar concludes that the ability to raise and lower all legs simultaneously was “a well-known technique in 2005, well within the knowledge and skill of a POSITA” and that “the combination of the teachings of Swisher and Neumeier, in further view of the knowledge of a POSITA, renders claim 10 obvious.” *Id.*

Wirtgen argues that Swisher does not disclose raising or lowering all legs simultaneously. Wirtgen Br. at 234 (arguing that the excerpts Caterpillar cites “only show that *Swisher*’s machine is able to operate at a certain height, regardless of whether wheels are individually adjusted to get to that position.”). Wirtgen also argues that Swisher does not teach “raising and lowering ‘tak[e] place in the same amount,’ as required by the claim.” *Id.* at 235. Wirtgen faults Caterpillar for “attempt[ing] to rely upon the state of the art in relation to Mannebach as an extraneous reference to fill gaps in Swisher and Neumeier.” *Id.* Additionally, Wirtgen argues that Mannebach uses a lifting column that connects two wheels, which “is an entirely different design than the independent four-wheel design of the ‘309 patent.” *Id.* With regard to Neumeier, Wirtgen argues that the reference is limited because “‘A POSITA would recognize from Neumeier’s schematic that it teaches raising or lowering a pair of its hydraulic cylinders together.’” *Id.* at 237 (quoting RX-0985C (Alleyne WS) at Q/A 828) (emphasis omitted).

Caterpillar replies, in part, that it references Mannebach “as an example of the knowledge of a POSITA in 2005 to implement this type of valve control. It is proper to consider prior art

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solutions to determine the knowledge of a POSITA.” *See* Caterpillar Reply at 78. Caterpillar adds that “there is ample evidence of record showing that claim 10 was known in the prior, including expert testimony from Dr. Alleyne about what Mannebach reveals about a POSITA’s knowledge.” *Id.* at 79.

Wirtgen replies, in part, that “[b]ecause the front and rear legs of Swisher differ, it is likely that achieving variable heights does not take place by raising and lowering all four legs by the same amount.” Wirtgen Reply at 82-83.

Having considered the parties’ arguments, the administrative law judge has determined that Caterpillar has not shown, through clear and convincing evidence, that Swisher and Neumeier, considered individually or jointly, disclose a machine that is capable of raising and lowering all legs at the same time, by the same amount. The administrative law judge has also determined that Caterpillar has not shown, through clear and convincing evidence that “the knowledge of a POSITA” or Mannebach, considered individually or jointly, disclose a machine that is capable of raising and lowering all legs at the same time, by the same amount.

Caterpillar and Dr. Alleyne rely on four passages from Swisher: JX-0029 at 4:1-5, 4:30-35, 7:4-8, and 11:64-66. *See* Caterpillar Br. at 244-45; RX-0985C (Alleyne WS) at Q/A 828-29. The four passages, with additional context, follow:

- “Each track assembly is connected to the underside of the main frame 12 by a selectively extendable leg assembly of which a left forward leg assembly 22 and a left rear leg assembly 24 are shown in FIG. 1. Each leg assembly is responsive to an elevation control assembly 26 and a cross-slope control assembly (not shown) which maintain the main frame 12 in a selected spatial orientation in relation to the roadway surface.” *See* JX-0029 at 4:1-9.
- “As the planer apparatus 10 is moved in the forward direction 35 by the drive assembly 14, the cutter drum assembly 30 cuts pavement material from the roadway surface. By selective orientation of the main frame 12 via the elevation and cross-slope control assemblies, (described more fully in the above mentioned U.S. Pat. No. 4,139,138), the cutter drum assembly 30 may be oriented so as to

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cut the roadway surface to coincide with a reference plane of predetermined spatial orientation. Accordingly, a paved surface of preselected grade and cross-slope may be formed.” *See* JX-0029 at 4:26-36.

- “As was mentioned previously, a leg assembly disposed adjacent each corner of the main frame 12 functions to connect each track assembly to the main frame 12. Each leg assembly further serves to maintain the main frame 12 at a selectively variable height above the roadway, as is required for proper cutting orientation of the planing assembly 28 to be described in greater detail hereafter.” *See* JX-0029 at 7:1-8.
- “Cutting bits 184, which will be worn down during operation of the cutter drum assembly 30, may be replaced by applying a striking pressure to the cutting bit 184, as by pneumatic hammer, through the open end of the bit holder 182 adjacent the flighting portion 176.” *See* JX-0029 at 11:64-68.

The above passages do not address coordinated movement of all four legs, as claim 10 requires.

See CX-0005C (Lumkes WS) at Q/A 306-10. The passages also do not specify that all of the legs are raised and lowered by the same amount, as claim 10 also requires. *Id.* Thus, Swisher does not teach the subject matter claim 10 encompasses.

Similarly, the passages of Neumeier that Caterpillar and Dr. Alleyne rely on do not teach the subject matter claim 10 encompasses. In particular, Caterpillar and Dr. Alleyne point to one figure and two pages in Neumeier. *See* Caterpillar Br. at 243-44 (citing RX-0029 at 29 and 35); RX-0985C (Alleyne WS) at Q/A 828. Dr. Alleyne’s entire explanation of Neumeier follows:

Q828. How, in your opinion, is this limitation satisfied?

A: As seen at RX-0029.0029, Neumeier explicitly discloses connecting a hydraulic oil source to the closed loop hydraulic circuit via two valves. Neumeier teaches compensation in both the “transverse direction and in the longitudinal direction.” A POSITA would recognize from Neumeier’s schematic that it teaches raising or lowering a pair of its hydraulic cylinders together. For example, as described at RX-0029.0035 of Neumeier and shown on the left side of RDX-0001.186, which includes annotated versions of Figure 1 of Neumeier, actuating valve 27, would allow pairs of hydraulic cylinders (1a, 2a) or (3a, 4a) to be raised or lowered together. Referring to the right side, a POSITA would also recognize that

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actuating valve 28 would allow pairs of hydraulic cylinders (1a, 3a) or (2a, 4a) to be raised or lowered together.

RX-0985C (Alleyne WS) at Q/A 828. Pages 28-29 of Neumeier, however, discuss “systems for shock compensation” and “compensate[ing] for inclinations of the vehicle caused by the terrain in the transverse direction and in the longitudinal direction[.]” RX-0029 at 28-29. Likewise, page 35 of Neumeier shows Neumeier is focused on vehicle stability. *Id.* at 35 (“By appropriately controlling the adjusting motors 32 and 33, it is thus possible to vertically stabilize the transverse inclination and the longitudinal inclination of the platform of the vehicle frame in both axles even when driving in off-road terrain, in addition to the described mutual compensation between the individual cylinders.”). *See* CX-0005C (Lumkes WS) at Q/A 326 (“Neumeier is about an off-roading vehicle. There is simply no need for an off-roading vehicle to raise and lower its chassis hydraulically . . .”). Further, Fig. 1 of Neumeier just shows that pairs of wheels may be raised or lowered, not that all wheels may be raised or lowered, much less “by the same amount” as claim 10 requires. *Id.* at Q/A 325. Thus, Neumeier does not teach the subject matter claim 10 encompasses. *Id.* at Q/A 321-27.

Caterpillar’s and Dr. Alleyne’s reliance on Mannebach is insufficient because the evidence does not support the argument appearing in Caterpillar’s brief. Caterpillar’s brief argues that Mannebach is used as “[o]ne example of the knowledge of a POSITA in 2005 to implement this type of valve control[.]” Caterpillar Br. at 246; *see also* Caterpillar Reply at 78 (“Caterpillar merely uses Mannebach as an example of the knowledge of a POSITA in 2005 to implement this type of valve control.”). Dr. Alleyne, in contrast, opined that Mannebach discloses limitations of claim 10:

Q834. Does Mannebach support your opinion?

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A: Yes. To the extent that Neumeier and Swisher do not explicitly teach a valve control designed so that all the wheels are raised in a first operating mode and are lowered in a second operating mode by the same amount, *Mannebach discloses these limitations* of the claim.

Q835. How does Mannebach disclose this limitation?

A: As seen at RX-0034, ¶ 34 and Figures 1, 2, and 4, Mannebach teaches a machine 1 for producing and working roadways with a machine chassis 4 supported by a running gear 2. Mannebach explicitly discloses, at ¶ 34 and Figures 1, 2, and 4, that “running gear 2 comprises two respective rear and front wheels 6, 8, which are attached to lifting columns 12 in a height adjustable manner [that] can be raised and lowered independently of one another or synchronously with one another.” Mannebach further discloses, at ¶ 34 and Figures 1, 2, and 4, that “[t]he lifting columns 12 are attached to the machine chassis 4.”

RX-0985C (Alleyne WS) at Q/A 834-35 (emphasis added).

Caterpillar’s argument cannot transform Dr. Alleyne’s testimony about what claim limitations Mannebach discloses into testimony about what one of ordinary skill in the art knew in 2005 or how one of skill in the art would read Swisher or Neumeier in light of the state of the art, as shown in Mannebach.³⁰ See *Icon Health & Fitness, Inc. v. Strava, Inc.*, 849 F.3d 1034, 1043 (Fed. Cir. 2017) (holding that attorney argument is not evidence and that the PTAB’s adoption of the petitioner’s brief did not “transform [the petitioner’s] attorney argument into factual findings or supply the requisite explanation that must accompany such findings”); see also *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1365 (Fed. Cir. 2015) (explaining that “[a]rt can legitimately serve to document the knowledge that skilled artisans would bring to bear in reading the prior art identified as producing obviousness.”). Additionally,

³⁰ In other words, the administrative law judge agrees with Wirtgen that Caterpillar is “attempt[ing] to rely upon the state of the art in relation to Mannebach as an extraneous reference to fill gaps in Swisher and Neumeier.” Wirtgen Br. at 235.

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the administrative law judge notes that the “State of the Art” and “One of Ordinary Skill in the Art” sections of Dr. Alleyne’s witness statement do not refer to Mannebach. *See* RX-0985C (Alleyne WS) at Q/A 743-52. Accordingly, the administrative law judge finds that the record does not support Caterpillar’s contention that it “merely uses Mannebach as an example of the knowledge of a POSITA in 2005.”

Similarly, Caterpillar’s reliance on the Roadtec RX-500 and Caterpillar PM-465 machines is not supported by evidence. *See* Caterpillar Br. at 246.³¹ In particular, Dr. Alleyne’s witness statement does not refer to either machine in relation to the ‘309 Patent. *See* RX-0985C (Alleyne WS) at Q/A 740-972 (Dr. Alleyne discusses the PM-565 at Q/A 743, but Caterpillar’s brief does not refer to the 565 model in relation to the ‘309 Patent). Accordingly, the administrative law judge finds that Caterpillar’s reliance on the Roadtec RX-500 and Caterpillar PM-465 machines is simply unsupported attorney argument, rather than relevant background evidence showing the state of the art, especially insofar as Caterpillar’s expert provided testimony on the state of the art that did not mention the Roadtec RX-500 and Caterpillar PM-465 machines.

In conclusion, the administrative law judge has determined that Caterpillar has not shown, through clear and convincing evidence, that claim 10 would have been obvious in light of Swisher and Neumeier, which are the references Caterpillar chose to present.

³¹ Caterpillar argues “as explained above, a POSITA in 2005 would also know of road milling machines such as the Roadtec RX-500 and Caterpillar PM-465, which included the ability to raise and lower all legs at the same time. JX-0045C (Lewis Deposition Transcript) at 80:8-81:10; RX-0028.0014 (PM-465 STMG); *see also* RX-0985C at Q/A 167. In short, this was a well-known technique in 2005, well within the knowledge and skill of a POSITA.” Caterpillar Br. at 246.

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4. Claim 26

a) 26[p] 26. *A road-building machine, comprising:*

Caterpillar argues that Swisher discloses a road-building machine. *See* Caterpillar Br. at 246.

Wirtgen concedes that “Swisher is directed to a road milling machine.” Wirtgen Br. at 230, 239-42.

The evidence shows that Swisher teaches a road-building machine. *See* RX-0021 (Swisher) at Figs. 1-3, Abstract, 1:5-10, 2:33-54; RX-0985C (Alleyne WS) at Q/A 790-91, 840-41. Dr. Lumkes also acknowledged that Swisher and Neumeier teach all of the elements of claim 26. *See* Lumkes Tr. 372. Dr. Lumkes testified as follows:

Q. I’m going to ask the same question for Claim 26. You don’t dispute that the combination of Swisher and Neumeier disclose all elements of Claim 26; is that right, sir?

A. That’s correct.

Id. Accordingly, the administrative law judge has determined that Swisher discloses this element of the claimed invention.

b) 26[a] *a chassis having a forward direction;*

Caterpillar argues that Swisher teaches a road-milling machine that has a chassis with a forward direction. *See* Caterpillar Br. at 247.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 239-42 (the limitation is not contested); Wirtgen Reply at 77 (same).

The evidence shows that Swisher teaches a road-building machine that has a chassis with a forward direction. *See* RX-0021 at Figs. 1-3, 6:52-57, 5:40-50; *see also* RX-0985C (Alleyne WS) at Q/A 842-843. Dr. Lumkes also acknowledged that Swisher and Neumeier teach all of

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the elements of claim 26. *See* Lumkes Tr. 372. Accordingly, the administrative law judge has determined that Swisher discloses this element of the claimed invention.

- c) ***26[b] a left front wheel or caterpillar; a right front wheel or caterpillar; a left rear wheel or caterpillar; a right rear wheel or caterpillar;***

Caterpillar argues that Swisher teaches a road-milling machine with left front, right front, left rear, and right rear caterpillars. *See* Caterpillar Br. at 247.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 239-42 (the limitation is not contested); Wirtgen Reply at 77 (same).

The evidence shows that Swisher teaches a road-milling machine with left front, right front, left rear, and right rear caterpillars. *See* RX-0985C (Alleyne WS) at Q/A 844-45; RX-0021 at Figs. 2-3. Dr. Lumkes also acknowledged that Swisher and Neumeier teach all of the elements of claim 26. *See* Lumkes Tr. 372. Accordingly, the administrative law judge has determined that Swisher discloses this element of the claimed invention.

- d) ***26[c] a first working cylinder rigidly connected to the chassis and connected to the left front wheel or caterpillar for adjusting a height of the left front wheel or caterpillar relative to the chassis; a second working cylinder rigidly connected to the chassis and connected to the right front wheel or caterpillar for adjusting a height of the right front wheel or caterpillar relative to the chassis; a third working cylinder rigidly connected to the chassis and connected to the left rear wheel or caterpillar for adjusting a height of the left rear wheel or caterpillar relative to the chassis; a fourth working cylinder rigidly connected to the chassis and connected to the right rear wheel or caterpillar for adjusting a height of the right rear wheel or caterpillar relative to the chassis;***

Caterpillar argues that Swisher teaches a road milling machine with four working cylinders, each rigidly connected to the chassis and connected to the respective caterpillar for

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adjusting the height of the respective caterpillar, as recited in element 26[c]. *See* Caterpillar Br. at 248.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 239-42 (the limitation is not contested); Wirtgen Reply at 77 (same).

The evidence shows that Swisher teaches a road milling machine with four working cylinders, each rigidly connected to the chassis and connected to the respective caterpillar for adjusting the height of the respective caterpillar, as recited in element 26[c]. *See* RX-0985C (Alleyne WS) at Q/A 846-47 (citing RX-0021 at 7:8-26, 8:40-45 and Figure 4). Dr. Lumkes also acknowledged that Swisher and Neumeier teach all of the elements of claim 26. *See* Lumkes Tr. 372. Accordingly, the administrative law judge has determined that Swisher discloses this element of the claimed invention.

- e) ***26[d] a rotating working roller or rotor supported from the chassis between the front wheels or caterpillars and the rear wheels or caterpillars and extending transversely to the forward direction;***

Caterpillar argues that Swisher's cutter drum teaches the "working roller or rotor" recited in element 26[d]. *See* Caterpillar Br. at 248-49.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 239-42 (the limitation is not contested); Wirtgen Reply at 77 (same).

The evidence shows that Swisher teaches a working roller or rotor, as recited in element 26[d]. *See* RX-0021 at 10:42-46; RX-0985C (Alleyne WS) at Q/A 849-51. Dr. Lumkes also acknowledged that Swisher and Neumeier teach all of the elements of claim 26. *See* Lumkes Tr. 372. Accordingly, the administrative law judge has determined that Swisher discloses this element of the claimed invention.

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- f) 26[e] each of the working cylinders including at least one working chamber filled with a pressure medium; and**

Caterpillar argues that Neumeier teaches working cylinders that have a chamber filled with oil. *See* Caterpillar Br. at 249.

Wirtgen argues that Swisher does not disclose this element, but is silent on Neumeier. *See generally* Wirtgen Br. at 243-44; Wirtgen Reply at 78, 83-84.

The evidence shows that Neumeier teaches working cylinders that have a chamber filled with oil, as recited in element 26[e]. *See* RX-0029 at 32-33; RX-0985C (Alleyne WS) at Q/A 812, 852-53. Dr. Lumkes also acknowledged that Swisher and Neumeier teach all of the elements of claim 26. *See* Lumkes Tr. 372. Accordingly, the administrative law judge has determined that Swisher discloses this element of the claimed invention.

- g) 26[f] coupling lines connecting the working cylinders to one another and providing a positive hydraulic coupling between the working cylinders in such a way that the left front wheel or caterpillar and the right rear wheel or caterpillar are adjusted in height in the same direction and in the opposite direction to the right front wheel or caterpillar and the left rear wheel or caterpillar.**

Caterpillar argues that “Neumeier teaches that its working cylinders are connected via coupling lines” and that “Neumeier teaches the same ‘positively coupled’ function recited in the ‘309 patent.” Caterpillar Br. at 250.

Wirtgen argues that Swisher does not disclose this element, but is silent on Neumeier. *See generally* Wirtgen Br. at 243-44; Wirtgen Reply at 78, 83-84.

The evidence shows that Neumeier teaches the use of coupling lines to connect its four working cylinders and that the coupling lines, which are part of Neumeier’s hydraulic system, provide a positive coupling between the cylinder such that the left front and right rear caterpillars can move similarly to each other and inversely in relation to the right front and left rear

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caterpillars. *See* RX-0029 (Neumeier) at 29, 33, Fig. 1; RX-0985C (Alleyne WS) at Q/A 854-55, 800, 802, 806. Dr. Lumkes also acknowledged that Swisher and Neumeier teach all of the elements of claim 1. *See* Lumkes Tr. 372. Accordingly, the administrative law judge has determined that Swisher and Neumeier disclose this element of the claimed invention.

5. Claim 29

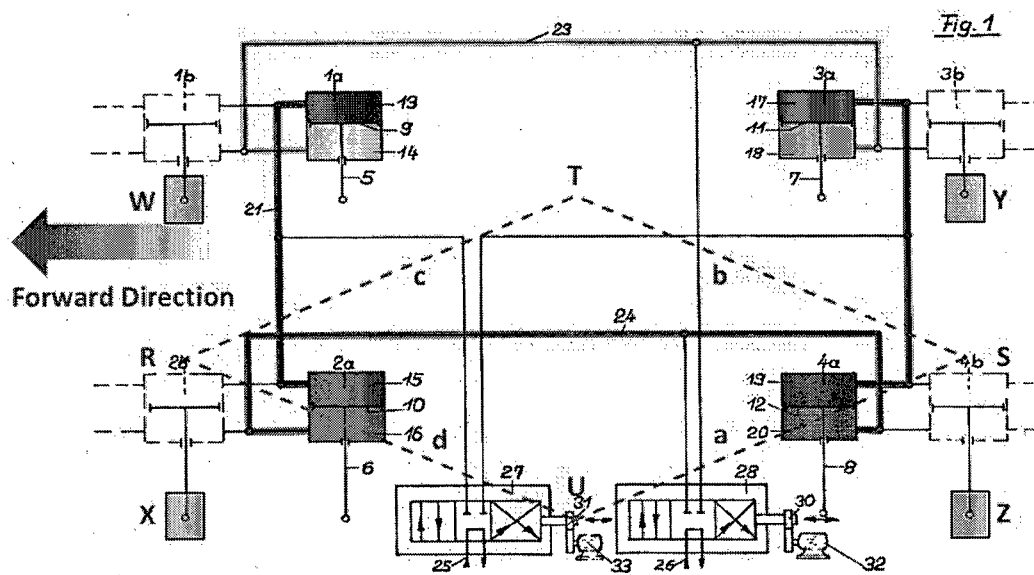
Claim 29 requires the road-building machine of claim 26 to have “a four sided stability pattern having a widest transverse dimension, transverse to the forward direction of the chassis, which widest transverse dimension falls within a footprint of the working roller or rotor.” JX-0005 at 14:32-36.

Caterpillar argues, in part, that:

The “four sided stability pattern” recited in dependent claim 29 is not a separate, stand-alone feature but, rather, an inherent and natural result of the combination of elements recited in claim 26. RX-0985C (Alleyne Direct Witness Statement) at Q/A 859. In other words, the stability pattern disclosed in the ‘309 patent results inherently because adjacent cylinders on the same side (*e.g.* wheels 4 and 6 or wheels 4 and 8) are configured to move in opposite directions. *Id.* This feature is likewise inherently disclosed by the combination of Swisher and Neumeier, rendering claim 29 obvious. RX-0985C at Q/A 857-867.

...

The same four-sided stability pattern of the ‘309 patent would be realized with the coupling scheme disclosed in Neumeier. RX-0985C at Q/A 861. In the figure below, the cross-coupling scheme of Neumeier is reproduced with a stability quadrangle that would necessarily and inherently be a product of Neumeier’s design. *Id.*; *see also* RDX-0001.199 (Alleyne Demonstrative). Wheels W, X, Y, and Z have been added and illustrated as being connected to cylinders 1a, 2a, 3a, and 4a, respectively. Points R, S, T, and U in the figure represent the midpoints between wheels (W, X); (Y, Z); (W, Y); and (X, Z), respectively. Axes a, b, c, and d are connected between pairs of mid-points (U, S); (S, T); (T, R); and (R, U), respectively. *Id.*



RDX-0001.199 (Alleyne Demonstrative).

Caterpillar Br. at 251.

Wirtgen argues, in part, that the '309 Patent's four-sided stability pattern "is an improvement from prior art machines because the patented machine is more stable than the prior art by the fact that 'the distance of the center of gravity S from all sides of the stability lozenge A, B, C, D is markedly greater than the distance of the center of gravity from any side of the stability triangle A', B', C'.'" Wirtgen Br. at 241. Wirtgen also argues that "Swisher's widest transverse dimension does not fall within the footprint of the working roller or rotor" and that "Swisher gives no indication of how far away the center of gravity and the roller might actually be." *Id.* at 242. Wirtgen further argues that:

Caterpillar's argument is not based on any evidence or any disclosure in Swisher or Neumeier. Caterpillar simply makes numerous assumptions and then finally assumes that the limitation must be met. Even if Swisher and Neumeier could be combined, a POSA is only left to guess whether the widest transverse dimension of the resulting stability figure falls within a footprint of Swisher's working roller. CX-0005C (Lumkes Rebuttal WS) Q346.

Id. With regard to Neumeier, Wirtgen argues:

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As for claim 29, Neumeier does not disclose “[t]he road-building machine of claim 26, wherein the machine has a four sided stability pattern having a widest transverse dimension, transverse to the forward direction of the chassis, which widest transverse dimension falls within a footprint of the working roller or rotor.” Caterpillar points to the cross-coupling scheme of the wheels that Caterpillar argues reproduces a “stability quadrangle,” as demonstrating this limitation. RX-0985C.0211-212 (Alleyne Direct WS). CX-0005C (Lumkes Rebuttal WS) Q355.

However, this fails to disclose the full scope of the claim element. Neumeier does not disclose a working roller or rotor and thus the widest transverse dimension of the alleged “stability quadrangle,” cannot fall within a footprint of a working roller or rotor. CX-0005C (Lumkes Rebuttal WS) Q356. While Caterpillar does not argue that Neumeier actually discloses this limitation, Caterpillar asserts that a machine using a combination of Neumeier and Swisher would. But, as discussed earlier with regard to Swisher, this combined machine would not meet this limitation. CX-0005C (Lumkes Rebuttal WS) Q357.

Id. at 244.

Caterpillar replies that “Wirtgen has not adequately rebutted Caterpillar’s evidence that the ‘four sided stability pattern’ recited in dependent claim 29 is an inherent and natural result of the combination of elements recited in claim 26.” Caterpillar Reply at 80. Caterpillar explains:

Wirtgen has failed to rebut that a POSITA would recognize that the widest transverse dimension of Neumeier’s four-sided stability pattern would be disposed within the footprint of Swisher’s cutting drum. Wirtgen argues that “Caterpillar makes an assumption” that this element is satisfied and states that “[t]here no indication that the cutting drum overlaps with any stability pattern created by Neumeier.” *Id.* at 242. This is not true. Caterpillar relies on ample evidence to show that the widest transverse dimension of Neumeier’s four-sided stability pattern would be disposed within the footprint of Swisher’s cutting drum. For example, Swisher itself teaches that the “center of gravity of the apparatus 10” is designed “to more closely coincide with the position of the planing assembly 28 than in prior art planers.” RX-0021 (Swisher) at 6:57-68. Moreover, the figures of Swisher show the cutter drum located roughly midway between its track assemblies. *Id.* at 4:12-15, Fig. 1, Fig. 5. Because Swisher’s cutter drum is located roughly midway between its track assemblies, and because the widest transverse

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dimension of the four-sided stability pattern obtained using Neumeier's positive coupling scheme is located about halfway between the front wheels W, X, and the rear wheels Y, Z, a POSITA would recognize that the widest transverse dimension of the four-sided stability pattern would overlap with a footprint of Swisher's cutter drum. RX-0985C at Q/A 864; *see also* RDX-0001.202 (Alleyne Demonstrative) (showing the widest transverse dimension of the resulting four-sided stability pattern overlapping the footprint of the rotor). Rather than rebut this evidence, Wirtgen argues that the figures of Swisher are not necessarily "to scale (unlike a CAD drawing . . . or a dimension specification drawings . . .)." Wirtgen PostHBr. at 242. This rebuttal fails because there is no requirement that prior art references be drawn to scale and because prior art references can be used to the extent of their enabling disclosures, which for Swisher would include the figures. *Perricone v. Medicis Pharm. Corp.*, 432 F.3d 1368, 1376 (Fed. Cir. 2005) ("[T]he disclosure is prior art to the extent of its enabling disclosure."); *EWP Corp. v. Reliance Universal Inc.*, 755 F.2d 898, 907 (Fed. Cir. 1985) ("A reference must be considered for everything it teaches by way of technology.").

Id. at 81-82 (footnote omitted).

The administrative law judge has determined that Caterpillar has not shown, through clear and convincing evidence, that Swisher and Neumeier teach a road-building machine that has a four-sided stability pattern where the widest transverse direction of the pattern falls within the milling drum's footprint. *See* CX-0005C (Lumkes RWS) at Q/A 333-58. Caterpillar's argument asks the administrative law judge to find that the four-sided stability pattern and milling drum footprint aspects of claim 29 are the "inherent and natural result" of combining a road-milling machine reference (Swisher) and an off-road vehicle reference (Neumeier).³² Caterpillar's expert, however, has not shown that the widest transverse direction of the pattern necessarily falls within the milling drum's footprint. *See Atofina v. Great Lakes Chem. Corp.*,

³² The Federal Circuit has cautioned that "that the use of inherency, a doctrine originally rooted in anticipation, must be carefully circumscribed in the context of obviousness." *PAR Pharm., Inc. v. TWI Pharm., Inc.*, 773 F.3d 1186, 1195 (Fed. Cir. 2014).

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441 F.3d 991, 1000 (Fed. Cir. 2006) (“inherent disclosure is appropriate only when the reference discloses prior art that must necessarily include the unstated limitation”); CX-0005C (Lumkes RWS) at Q/A 346 (“Even if Swisher and Neumeier could be combined, you are only left to guess whether the widest transverse dimension of the resulting stability figure falls within a footprint of Swisher’s working roller.”). While Swisher does describe the center of gravity of the machine, *see* RX-0021 at 6:57-68, Swisher’s discussion is not detailed enough to conclude that a hypothetical Swisher-Neumeier combination necessarily teaches the subject matter of claim 29.³³ *See Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1297 (Fed. Cir. 2002) (“Inherency does not embrace probabilities or possibilities.”); CX-0005C (Lumkes RWS) at Q/A 344 (“In fact, Swisher gives no indication of how far away the center of gravity and the roller might actually be.”).

6. Rationale for Combining Swisher and Neumeier

Caterpillar argues:

A POSITA would have been motivated to combine Swisher with Neumeier in 2005 for several reasons. First, both Swisher and Neumeier are related to road-building or construction machines, and both are directed to controlling and adjusting the elevation and/or inclination of the machine frame relative to the ground. RX-0985C at Q/A 775 (Alleyne Direct Witness Statement). Specifically, Swisher is directed to a planer type road construction apparatus for precision planing of an existing paved roadway. RX-0021 (Swisher) at 1:5-10. Neumeier relates generally “to an off-road vehicle,” such

³³ RX-0021 at 6:52-68 explains: “It will be noted that the provision of four track and leg assemblies represents an improvement over those prior art planers which have featured only three track and leg assemblies. The four track and leg assemblies permit wider distribution of the weight of the main frame 12, thereby stabilizing the apparatus 10. Further, the four track construction affords the use of a substantially rectangular main frame, which permits a better distribution of the components supported by the main frame 12, permitting the center of gravity of the apparatus 10 to more closely coincide with the position of the planing assembly 28 than in prior art planers. This permits maintenance and control of more uniform downward pressure on the planing assembly 28 by the main frame 12, as required for maximum control of vibrations, and for minimizing track assembly spinout and track wear by the apparatus 10.”

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as a wheel loader tractor (*i.e.*, front-end loader), which is a construction-related vehicle well known to a POSITA in 2005. RX-0029.0028, RX-0029.0042, Fig. 9 (Neumeier). Dr. Meyer admitted that front-end loaders are construction machines “in the sense that you would see them at construction sites” and that “[t]hey are mobile,” yet contends that they are not “mobile construction machines.” Tr. (Meyer) at 20:15-22.

Moreover, Swisher and Neumeier are directed to the same problem—maintaining stability over uneven ground. RX-0985C at Q/A 776. Swisher teaches that “four track and leg assemblies permit wider distribution of the weight of the main frame 12, thereby stabilizing the apparatus.” RX-0021 at 6:52-68. Further, Swisher teaches control of both the cross-slope and the elevation (*i.e.*, the transverse and longitudinal inclinations) of a road-building machine by extending and retracting the hydraulic cylinders within its leg assemblies. *Id.* at 18:34-19:14.

Neumeier addresses the problem of ensuring stability of the machine frame when it travels over uneven terrain. RX-0985C at Q/A 779. Specifically, Neumeier discloses an off-road construction vehicle that assumes a stable position even when it encounters sudden changes in the ground surface. RX-0029.0028. Neumeier teaches that this compensation is achieved with wheels or axles that are individually adjusted by hydraulic cylinders. *Id.* at RX-0029.0029, 32-33. The hydraulic cylinders are interconnected and function as double-acting working cylinders. *Id.* The positively connected working cylinders of Neumeier operate such that “wheels located next to and behind one another thus move in opposite directions, while diagonally opposing wheels move in the same direction.” RX-0029.0033.

Thus, a POSITA would recognize Swisher and Neumeier as related to the same type of device and concerned with similar problems and would consider the teachings of Swisher and Neumeier to be complimentary. RX-0985C (Alleyne Direct Witness Statement) at Q/A 781.

Moreover, because of the extensive teachings in the prior art, a POSITA would not have encountered any technical hurdles in implementing the positively coupled double-acting working cylinders of Neumeier on the road-building machine of Swisher. RX-0985C at Q/A 782. In fact, a POSITA would recognize that Swisher already disclosed leg assemblies that extended and retracted using hydraulic cylinders. *Id.* And the prior art is replete with the use of hydraulic cylinders on work machines. *Id.* Therefore, a POSITA would know how to replace Swisher’s hydraulic cylinders

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with Neumeier's cross-connected double-acting working cylinders. *Id.* Specifically, a POSITA would have recognized that all that was required to achieve Neumeier's positive coupling was to connect the chambers of the hydraulic cylinders of Swisher according to the coupling line connections disclosed by Neumeier. *Id.*

As explained in Swisher and Neumeier, the use of coupling lines, including for connecting hydraulic cylinders, was well known in the art. RX-0985C at Q/A 783. For example, Swisher discloses connecting its hydraulic cylinder to a hydraulic pump. RX-0021 at 8:51-53. Therefore, it would not have been difficult for a POSITA to connect the two chambers of the hydraulic cylinders in Swisher's leg assemblies using connecting lines as disclosed in Neumeier. RX-0985C at Q/A 783. Alternatively, a POSITA would not have found it difficult to replace Swisher's hydraulic cylinders with Neumeier's hydraulic cylinders and to connect those cylinders according to Neumeier's coupling lines. *Id.*

Based on the predictable results of Neumeier's design, a POSITA would have had a reasonable expectation that connecting Swisher's hydraulic cylinders to each other using Neumeier's teachings, or implementing Neumeier's positively coupled hydraulic cylinders on Swisher's machine, would have caused Swisher's leg assemblies to behave in a manner similar to that disclosed in Neumeier. RX-0985C at Q/A 784. If Neumeier's positive coupling was implemented on the hydraulic actuators in Swisher's leg assemblies, the track assemblies of Swisher located next to and behind one another would move in opposite directions, while diagonally opposing track assemblies would move in the same direction, in the same manner that they did on Neumeier's machine. *Id.*

Caterpillar Br. at 236-39. Caterpillar provides additional rationale throughout its briefs, and Dr.

Alleyne intersperses additional rationale throughout his testimony. *See, e.g., id.* at 243; RX-

0985C (Alleyne WS) at Q/A 775-85, 807, 813, 816, 822, 829, 848.

Wirtgen argues, in part, that:

There are no reasons to combine Swisher with Neumeier because, for example, Swisher does not teach any type of floating system. The apparatus in Swisher is a road milling machine with leg assemblies that are individually adjustable. They are not connected in any way. Neumeier on the other hand does not teach a road-building machine, despite Caterpillar's contrary assertion. In fact, Neumeier fails to even discuss a working roller or rotor, among

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many other deficiencies noted above. So relying on the Swisher and Neumeier combination is flawed. There is no reason to combine them. CX-0005C (Lumkes Rebuttal WS) Q359-60.

Wirtgen Br. at 245. Wirtgen also argues that “Caterpillar has failed to identify how or why a POSA would have replaced the leg assemblies in Swisher with the hydraulic cylinders of Neumeier beyond the cursory explanation that ‘ensuring stability by maintaining the orientation of the machine frame.’” *Id.* Wirtgen also argues that:

the proposed combination of Swisher and Neumeier would actually render Swisher unsatisfactory for its intended purpose. If the Swisher planer apparatus were modified as proposed by Caterpillar, the lower end of the hydraulic cylinder in Neumeier is connected to an axle, which also connects to the two front wheels and the two rear wheels. This would not work on Swisher. The stabilization effect from Swisher stems from the weight distribution and size of the machine and the center of gravity more closely coinciding with the position of the planing assembly. If the axles in Neumeier were to be taken away, the leg assemblies in Neumeier would be inoperable; however, the Swisher machine would be inoperable with axles. CX-0005C (Lumkes Rebuttal WS) Q372-73.

Id. at 247.

Having considered the parties’ arguments, the administrative law judge has determined a person of ordinary skill in the art “would have been motivated to rigidly mount Neumeier’s positively coupled hydraulic cylinders to Swisher’s road-building machine to improve stabilization over uneven terrain[.]” RX-0985C (Alleyne WS) at Q/A 807. In this regard, the motivation for combining Neumeier into Swisher reflects combining prior art elements according to known methods (or, alternatively, routine improvement of a base device by incorporating a known improvement), with predictable results. *See KSR*, 550 U.S. 398, 417 (2007) (“if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.”); RX-0985C (Alleyne WS) at Q/A 781

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(“A POSITA would have found it obvious to use the known solution disclosed by Neumeier to improve the stability of Swisher’s machine.”). Although Swisher’s road-building machine and Neumeier’s off-road vehicle belong to different classes of vehicles, a person of ordinary skill in the art would have been deterred from combining the references given that both references described construction machines. RX-0985C (Alleyne WS) at Q/A 775 (“both Swisher and Neumeier are related to road-building or construction machines.”); *KSR*, 550 U.S. at 420 (“familiar items may have obvious uses beyond their primary purposes”).

The administrative law judge, however, does not agree with the entirety of Dr. Alleyne’s opinions regarding the combination of Swisher and Neumeier. For instance, the administrative law judge does not credit Dr. Alleyne’s opinion that “Swisher addresses similar problems as the ‘309 patent.” RX-0985C (Alleyne WS) at Q/A 778 (citing RX-0021 at 6:52-68, 7:1-14, 18:34-19:14). Swisher’s “Background of the Invention” and the “Summary of the Invention” indicate that Swisher is focused on a variety of problems including, *inter alia*, avoiding walls and curbs, operating during “extremely cold weather conditions,” and replacing the teeth in the milling drum. RX-0021 at 1:4-3:16. Similarly, the administrative law judge does not credit Dr. Alleyne’s opinion that a person of ordinary skill in the art would “implement the hydraulic coupling system disclosed in Neumeier with the hydraulic cylinders in Swisher’s leg assemblies to . . . **simplify the design, and reduce cost.**” RX-0985C (Alleyne WS) at Q/A 781 (emphasis added).³⁴ Simply put, Dr. Alleyne has not explained how adding components from Neumeier would simplify Swisher and also reduce the cost of Swisher-Neumeier combination. *See, e.g.,*

³⁴ The administrative law judge credits Dr. Alleyne’s opinion that a person of ordinary skill “would have been motivated to implement the hydraulic coupling system disclosed in Neumeier with the hydraulic cylinders in Swisher’s leg assemblies to improve the stability of Swisher’s machine on uneven terrain[.]” RX-0985C (Alleyne WS) at Q/A 781

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Black & Decker, Inc. v. Positec USA, Inc., 646 F. App'x 1019, 1027 (Fed. Cir. 2016)

(“Replacing [the prior art’s] yoke with bolts or screws, as the Board suggests, would increase the number of components necessary to mount the motor and, thereby, increase assembly and repair costs.”). Ultimately, though, these shortcomings do not upset the conclusion that a person of ordinary skill “would have been motivated to implement the hydraulic coupling system disclosed in Neumeier with the hydraulic cylinders in Swisher’s leg assemblies to improve the stability of Swisher’s machine on uneven terrain[.]” RX-0985C (Alleyne WS) at Q/A 781.

Accordingly, the administrative law judge finds that Caterpillar has shown, through clear and convincing evidence, that a person of ordinary skill in the art would have motivated to improve Swisher through the solutions described in Neumeier.

F. Obviousness – Swisher, Neumeier, and Frey

Caterpillar argues that “asserted claim 36 is obvious over the combination of Swisher, Neumeier, and Frey.” Caterpillar Br. at 231. Frey (RX-0030) is U.S. Patent Publication 2002/0074758.

Wirtgen argues, in general, that Swisher, Neumeier, and Frey do not disclose every element of claims 35 and 36 and that a person of skill in the art would not combine the prior art references. *See generally* Wirtgen Br. at 249-56. Wirtgen does not dispute that Swisher, Neumeier, or Frey are prior art under 35 U.S.C. § 102(b). *Id.*

1. Claim 35

Claim 35 requires that the road-building machine of claim 26 further include “a pressure medium source; at least one working line connecting the pressure medium source to at least one of the coupling lines; and at least one control valve disposed in the at least one working line, the control valve having a first position in which the positive hydraulic coupling between the

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working cylinders is temporarily cancelled, and having a second position in which the positive hydraulic coupling is restored.” JX-0005 at 14:57-67.

a) *a pressure medium source;*

Caterpillar argues that “the combination of Swisher and Neumeier teaches this limitation.” Caterpillar Br. at 256.

Wirtgen argues that Swisher does not disclose this element, but is silent on Neumeier. *See generally* Wirtgen Br. at 249-50; Wirtgen Reply at 84-85.

The evidence shows that Neumeier discloses a working line connected to an oil pump, which teaches a pressure medium source. *See* RX-0985C (Alleyne WS) at Q/A 820-21, 893; RX-0029 at 34-35. Accordingly, the administrative law judge has determined that Neumeier discloses this aspect of claim 35.

b) *at least one working line connecting the pressure medium source to at least one of the coupling lines;*

Caterpillar argues that “the combination of Swisher and Neumeier teaches this limitation.” Caterpillar Br. at 256-57.

Wirtgen argues that Swisher does not disclose this element, but is silent on Neumeier. *See generally* Wirtgen Br. at 249-50; Wirtgen Reply at 84-85.

The evidence shows that Neumeier teaches working lines that connect the pump to a coupling line. *See* RX-0985C (Alleyne WS) at Q/A 820-21, 893; RX-0029 at 34-35. Accordingly, the administrative law judge has determined that Neumeier discloses this aspect of claim 35.

c) *and at least one control valve disposed in the at least one working line, the control valve having a first position in which the positive hydraulic coupling between the working cylinders is temporarily*

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cancelled, and having a second position in which the positive hydraulic coupling is restored.

Caterpillar argues:

The combination of Swisher as modified by Neumeier satisfies this limitation of claim 35. RX-0985C (Alleyne Direct Witness Statement) at Q/A 896-899. Specifically, Neumeier teaches that the positions of the control slides of control valves 27 and 28 can be changed by adjusting motors 33 and 32 with spindle drives 31 and 30. RX-0029.0035 (Neumeier) at Fig. 1. A POSITA would have understood that shifting the control valves 27 and/or 28 to the right or left would connect working lines 25 and 26 with the respective coupling lines 21, 22 and 23, 24, temporarily canceling positive coupling. RX-0985C at Q/A 897.

A POSITA would also recognize that adjusting control valves 27 and 28 to a neutral position using the adjusting motors 33 and 32 would restore the positive coupling. RX-0985C at Q/A 898; RX-0029.0035; *see also* RDX-0001.209 (Alleyne Demonstrative) (annotated Fig. 1). Adjusting control valves 27 and 28 to neutral would block off Neumeier's hydraulic circuit from the oil pump and tank, restoring a closed hydraulic circuit with positive coupling. *Id.*

Caterpillar Br. at 257.

Wirtgen argues that Swisher does not disclose this element, but is silent on Neumeier.

See generally Wirtgen Br. at 249-50; Wirtgen Reply at 84-85; *see also* CX-0005C (Lumkes RWS) at Q/A 382-99 (Dr. Lumkes offers no opinion on Neumeier with respect to claim 35).

The evidence shows that Neumeier teaches working lines that connect the pump to a coupling line. Dr. Alleyne testified as follows:

Q896. What is the next limitation of claim 35?

A: The next limitation is [35.c] "at least one control valve disposed in the at least one working line, the control valve having a first position in which the positive hydraulic coupling between the working cylinders is temporarily cancelled, and having a second position in which the positive hydraulic coupling is restored."

Q897. In your opinion, do either Swisher, Neumeier, or Frey teach this limitation?

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A: Yes, Neumeier does. Specifically, at RX-0029.0035 and Figure 1, Neumeier discloses embodiments where control valves 27 and/or 28 are used to execute longitudinal inclinations and/or transverse inclinations. Neumeier teaches, at RX-0029.0029, .0035, and Figure 1, that its hydraulic working cylinders “are connected to one another by a connection network to allow mutual compensation, and this connection system is additionally connected to two pressure sources, such as hydraulic pumps.” As seen at RX-0029.0035, Neumeier also teaches “a control valve 28, which either supplies the oil flow delivered by the pump line 26 to the pipe 23 or 24, or recirculates it back to the tank.” Similarly, at RX-0029.0035 and Figure 1, Neumeier teaches a “control valve 27” that “is fed by the pump line 25” from a pump and may supply oil via connecting lines 21 and/or 22.

Q898. In your opinion, what would a POSITA have understood from this teaching in Neumeier?

A: A POSITA would readily recognize, from RX-0029.0035 and Figure 1 of Neumeier, that adjusting control valves 27 and 28 to a neutral position using the adjusting motors 33 and 32 would restore the positive coupling. Referring to RDX-0001.209, which shows an annotated version of Figure 1 of Neumeier, adjusting control valves 27 and 28 to the neutral position would block off Neumeier’s hydraulic circuit from the oil pump and tank. When control valves 27 and 28 are in the neutral position, movement of a piston in any of Neumeier’s four hydraulic cylinders would cause a movement in the opposite direction in the adjacent hydraulic cylinders and a movement in the same direction in a diagonally opposite hydraulic cylinders.

RX-0985C (Alleyne WS) at Q/A 896-98. Neither Wirtgen nor Dr. Lumkes rebut Dr. Alleyne’s opinion. *See, e.g.*, CX-0005C (Lumkes RWS) at Q/A 382-99 (Dr. Lumkes offers no opinion on Neumeier with respect to claim 35). In view of Caterpillar’s argument and the evidence it relies on, the administrative law judge has determined that Neumeier discloses this aspect of claim 35.

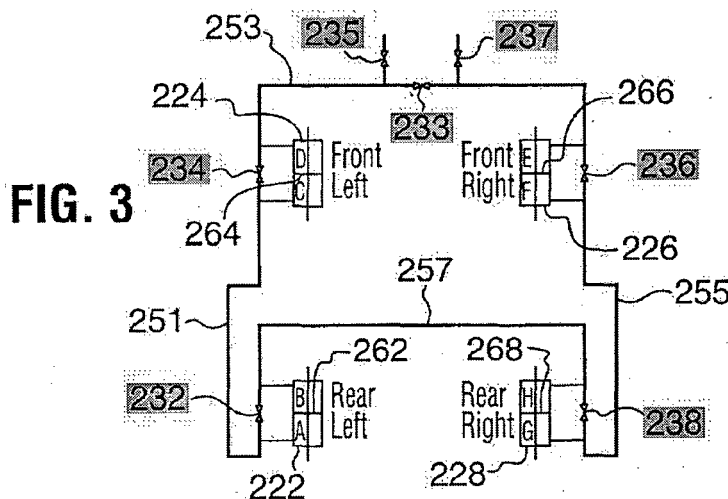
In conclusion, if claim 26 were found obvious, the administrative law judge would find claim 35 obvious.

2. Claim 36

Claim 36 requires that the working line and control valve from claim 35 “are arranged so that an individual one of the wheels or caterpillars is raised in a first operating mode and is lowered in a second operating mode.” JX-0005 at 15:1-5.

Caterpillar argues that claim 36 would have been obvious in light of Swisher, Neumeier, and Frey. Caterpillar Br. at 258. Caterpillar argues that Swisher and Neumeier both teach height-adjustable legs and that Neumeier teaches raising or lowering a pair of wheels. *Id.* at 258-59. Caterpillar relies on Frey as follows:

Although Neumeier discloses height adjustment of individual hydraulic cylinders, it does not explicitly illustrate the specific circuitry required for individual adjustment of the hydraulic cylinders. RX-0985C at Q/A 906. However, in view of Frey, a POSITA would have been able to design a valve system that would have allowed raising or lowering of an individual hydraulic cylinder as disclosed by Neumeier. *Id.* As explained above, and as shown in annotated Figure 3 below, Frey teaches opening and closing valves located at each double-acting cylinder to pump hydraulic fluid into the circuit:

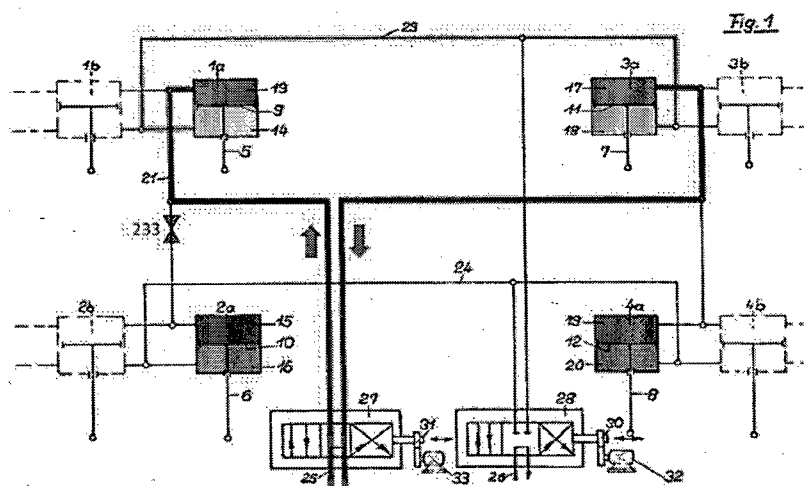


RDX-0001.205 (Alleyne Demonstrative) (annotated Fig. 3); see also RX-0030 (Frey) at ¶ [0025]. Frey also discloses a valve 233 that can uncouple the front left hydraulic cylinder from the front right hydraulic cylinder when the circuit is connected to an external fluid source or sump, for example, via valves 235 and 237. Thus,

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Frey teaches a system that can be switched to a non-cross-connected mode that allows each leg to be individually operated, independent of the other legs. RX-0985C at Q/A 879, 907.

Selectively implementing one or more of valves 232-238 of Frey in Neumeier's hydraulic circuit would have resulted in a road-building machine capable of raising or lowering individual wheels. RX-0985C at Q/A 908. For example, RDX-0001.211 below shows Figure 1 of Neumeier annotated. Adding a valve like Frey's valve 233 in Neumeier's coupling line 21 would permit decoupling of hydraulic cylinders 1a and 2a in the same way that valve 233 would decouple Frey's front left cylinder from the front right cylinder. RX-0985C at Q/A 908.



RDX-0001.211 (Alleyne Demonstrative) (annotated Fig. 1 of Neumeier).

A POSITA would understand that actuating valve 27 while closing valve 233 would allow a hydraulic cylinder (e.g., 1a) of Neumeier to be raised or lowered individually. RX-0985C at Q/A 909. A POSITA would also recognize from Frey that adding valves similar to valve 233 between adjacent hydraulic cylinders (1a, 3a), (3a, 4a), and (2a, 4a) in coupling lines 23, 22, and 24, respectively, would make it possible to individually raise any of cylinders 1a, 2a, 3a, or 4a. *Id.* A POSITA would understand that implementing Neumeier's hydraulic cylinders and positive coupling in Swisher's machine and implementing valves similar to Frey's valves 233 in the coupling lines would yield a road-building machine in which an individual wheel could be raised in a first operating mode and lowered in a second operating mode, as claim 36 recites. *Id.*

Caterpillar Br. at 261.

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Wirtgen argues, in part:

What Caterpillar points to does not disclose the claim element. Frey teaches the use of the valves to fill the circuit *prior* to operation, it does not teach the use of the valves to individually raise and lower a leg. RX-0030.0006 ¶25 (Frey). In fact, Frey's system runs with a closed loop "[i]n order to balance the load between the four corners. RX-0030.0006 ¶27 (Frey). Also, the suspension system is used to allow "equalization of load on the frame between all four cylinders." RX-0030.0007 ¶34 (Frey). CX-0005C (Lumkes Rebuttal WS) Q396.

Thus, besides the limitations in claim 35 that none of the references disclose, none of the references disclose "at least one working line and the at least one control valve are arranged so that an individual one of the wheels or caterpillars is raised in a first operating mode and is lowered in a second operating mode" in claim 36. CX-0005C (Lumkes Rebuttal WS) Q397.

This is unsurprising given that Swisher does not have four-way float. And Neumeier and Frey are about off-roading vehicles and farm wagons. They do not pose the same requirements and problems surrounding a road-milling machine. So there is absolutely no reason one would want to raise and lower a single wheel. That is a requirement of road milling machines, but a POSA would never find such a specialized functionality on an off-road machine or wagon. CX-0005C (Lumkes Rebuttal WS) Q398. Frey does not disclose the valve control that can raise or lower individual wheels. So Frey does not teach or suggest claim 36. CX-0005C (Lumkes Rebuttal WS) Q399.

Wirtgen Br. at 251-52.

Caterpillar's entire reply is:

Wirtgen has not adequately rebutted Caterpillar's evidence that the combination of Swisher, Neumeier, and Frey renders claim 36 obvious. Wirtgen argues that none of Swisher, Neumeier, or Frey teach "at least one control valve are arranged so that an individual one of the wheels or caterpillars is raised in a first operating mode and is lowered in a second operating mode." *Id.* at 250-252. However, Caterpillar's argument is that the limitation of claim 36 would have been obvious to a POSITA based on the obvious combination of Swisher and Neumeier, further in view of Frey. RX-0985C (Alleyne Direct Witness Statement) at Q/A 901-912. Caterpillar admits that even though Neumeier discloses height

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adjustment of individual hydraulic cylinders, it does not explicitly illustrate the specific circuitry required for individual adjustment of the hydraulic cylinders. RX-0985C at Q/A 906. However, in view of Frey, a POSITA would have been able to design a valve system that would have allowed raising or lowering of an individual hydraulic cylinder as disclosed by Neumeier. *Id.* For claim 36, Caterpillar has shown that the answer to the relevant inquiry—whether the subject matter as a whole would have been obvious—is yes. *See Boundary Sols., Inc. v. CoreLogic, Inc.*, 711 F. App'x 627, 631 (Fed. Cir. 2017) (nonprecedential) (“Rather than look to whether individual elements of the Asserted Claims are present in the prior art, the actual question we must address is whether the . . . ‘subject matter as a whole’ would have been obvious.”).

Caterpillar Reply at 82-83.

In reply, Wirtgen argues, in part, that:

Raising and lowering a single wheel is a specialized requirement of road milling machines that one of skill in the art would not expect to find on an off-road machine or wagon. CX-0005C (Lumkes Rebuttal WS) Q398-99. In all of Frey’s embodiments, the movement of one cylinder causes the movement of all cylinders. Prior to or after operation, Frey adds fluid to the cylinders by opening valves. CX-0005C (Lumkes Rebuttal WS) Q403; *see also* RX-0030.0006 (Frey) ¶ [0025] (“[P]rior to operation, fluid is pumped into the circuit filling the lower and upper parts of each cylinder with fluid. This is accomplished by opening valves 232, 233, 234, 235, 236, 237, and 238.”). During operation, after filling the cylinders, the system is closed by closing those valves, creating a closed system in which fluid flows freely between all cylinders. RX-0030.0007 ¶34 (Frey) (discussing closing valves 232, 233, 234, 235, 236, 237, and 238). CX-0005C (Lumkes Rebuttal WS) Q396.

Wirtgen Reply at 85.

Having considered the parties’ arguments, the administrative law judge has determined that Caterpillar has shown, through clear and convincing evidence, that all of the elements of claim 36 were present in Swisher, Neumeier, and Frey. In particular, a person of ordinary skill in the art would have understood that adding a controllable valve (*e.g.*, any of valves 232-238 from Frey) into Neumeier’s coupling line would allow an operator to raise or lower one of

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Neumeier's legs. RX-0985C (Alleyne WS) at Q/A 908-09. Further, this addition would have been within an ordinary artisan's skill, and the addition would have had a reasonable expectation of success. *Id.* at Q/A 910. Accordingly, if claim 26 were found obvious, the administrative law judge would find claim 36 obvious.

3. Rationale for Combining Swisher, Neumeier, and Frey

Caterpillar argues, in part:

Like Swisher and Neumeier, Frey addresses the same problem—improving stability over uneven terrain. RX-0985C at Q/A 881-882. Specifically, Frey teaches that “vehicles generally require some form of suspension means and many designs of such suspension means have been developed over the years.” RX-0030 (Frey) at ¶ [0002]. Frey further recognizes the need for a suspension system to equalize the load on vehicle wheels as they encounter uneven terrain. *Id.* at ¶¶ [0002], [0004]. Frey acknowledges a need for “a suspension system that is simple and cost effective.” *Id.* Thus, a POSITA would recognize Swisher, Neumeier, and Frey as being related to the same type of device and concerned with similar problems, namely improving stability of mobile construction machines. RX-0985C at Q/A 881-883.

Based on the disclosures of Swisher, Neumeier, and Frey, and further based on the knowledge of the art, a POSITA would have been motivated to incorporate the teachings of Frey into the Swisher machine equipped with Neumeier's positively coupled hydraulic cylinders. *Id.* Individual control of the legs was known to be helpful, for example, when inspecting or repairing portions of the hydraulic cylinders or track assemblies on the legs. *Id.*

Caterpillar Br. at 261-62. Caterpillar also argues that Mannebach shows that the “ability to control one of the four leg assemblies individually was well known in the art long before 2005.” *Id.* at 262.

Wirtgen argues, in part:

Frey's farm wagon disclosure never addresses the issue of individually raising or lowering a wheel. Quite the contrary, in every embodiment disclosed by Frey, *if one cylinder is moving, all of the cylinders are moving*. For example, Frey states, “prior to

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operation, fluid is pumped into the circuit filling the lower and upper parts of the *each* cylinder with fluid. This is accomplished by opening valves 232, 233, 234, 235, 236, 237, and 238.” RX-0030.0006 ¶25 (Frey) (emphasis added); CX-0005C (Lumkes Rebuttal WS) Q402. Frey discloses adding the fluid to all of the cylinders by virtue of the open valves. Frey then states, “[d]uring *operation*, after the lower part and upper part of each cylinder is filled with fluid, *the system is closed* by closing valves 232, 233, 234, 235, 236, 237, and 238.” RX-0030.0006 ¶25 (Frey) (emphasis added); CX-0005C (Lumkes Rebuttal WS) Q403. Frey never mentions operating any of its valves individually, a fact Caterpillar ignores. But it also wouldn’t make sense for Frey to operate its valves individually, Frey is not concerned with raising or lowering any wheel individually, as required by claim 36. CX-0005C (Lumkes Rebuttal WS) Q404.

Wirtgen Br. at 253. Wirtgen also argues that “A POSA would not have looked to farm wagons to make adjustments to a road-building machine” and that “Frey actually discourages the use of additional valves, stating that ‘[b]y not including the use of intermediate parts such as accumulators and valves, the circuit remains simple to operate and cost effective to maintain.’” *Id.* at 254.

Having considered the parties’ arguments, the administrative law judge has determined that a person of ordinary skill in the art might look to Frey, and consider its teachings, when attempting to design a road-building machine where an operator can raise or lower an individual wheel or caterpillar. *See* RX-0985C (Alleyne WS) at Q/A 883, 879, 908-10. In particular, a mechanical engineer with two to five years of experience in mobile-construction-machine design would understand that the valves disclosed in Frey (*e.g.*, 232, 234, 236, or 238) could be used to disengage cross-coupled hydraulic lines and that this would be a useful feature. *Id.* at Q/A 879, 883. Further, Frey, Swisher, and Neumeier address the same problem, *i.e.*, improving stability over uneven terrain, a person of ordinary skill in the art would have understood that Frey and Neumeier are compatible, and a person of ordinary skill in the art would have understood that

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Frey's valves, if incorporated into the Swisher-Neumeier combination, would function as they did in Frey. *Id.* at 883, 886-88.

In conclusion, if claim 35 were found obvious, the administrative law judge would find claim 36 obvious.

G. Obviousness – Secondary Considerations

Wirtgen argues that evidence of copying and commercial success indicates that the '309 Patent would not have been obvious. *See* Wirtgen Br. at 256-59. Caterpillar argues that "Wirtgen's alleged secondary considerations are unsupported by the evidence, and do not overcome the strong showing of obviousness[.]" Caterpillar Br. at 263.

1. Copying

Copying typically arises in a secondary-considerations analysis where the accused infringer has copied the patentee's invention. *See, e.g., DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1329 (Fed. Cir. 2009); *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1325 (Fed. Cir. 2004). Copying "requires the replication of a specific product." *Iron Grip Barbell*, 392 F.3d at 1325. Copying "may be demonstrated either through internal documents . . . direct evidence such as disassembling a patented prototype, photographing its features, and using the photograph as a blueprint to build a virtually identical replica, . . . or access to, and substantial similarity to, the patented product (as opposed to the patent)." *Id.* (citations omitted); *see also Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010) ("copying requires evidence of efforts to replicate a specific product, which may be demonstrated through internal company documents, direct evidence such as disassembling a patented prototype, photographing its features, and using the photograph as a blueprint to build a

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replica, or access to the patented product combined with substantial similarity to the patented product.”).

Wirtgen argues that Caterpillar copied Wirtgen’s machines, which Wirtgen argues practice the ‘309 Patent. *See* Wirtgen Br. at 256. Wirtgen relies on [

]. *Id.* at 256-58.

Caterpillar argues, in part:

Wirtgen’s allegation that Caterpillar copied Wirtgen’s “four-way floating axle” design is baseless. Wirtgen seems to believe that any design that implements connecting lines between four leg cylinders and a valve control that allows all legs, or individual legs, to be raised or lowered is a “direct cop[y]” of Wirtgen’s “four-way floating axle system.” CX-0005 (Lumkes Rebuttal WS) at Q/A 421. But those features already existed in the prior art and therefore were not “copied” from Wirtgen. [

.”)]. The idea of using connecting lines between four leg cylinders has been known since at least 1971—when it was disclosed and fully described by Neumeier. Wirtgen did not invent this concept and cannot credibly accuse Caterpillar of “copying” it from Wirtgen.

Caterpillar Br. at 263-64. Caterpillar also argues that “the ability to raise and lower all legs” was well known and that the PM-465 already possessed this functionality. *Id.* at 264 (“This was already Caterpillar’s technology.”). Caterpillar also argues that “Wirtgen has failed to show that each component in Caterpillar’s system [(

)], corresponds to an identical

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component in Wirtgen's system" or the '309 Patent's figures. *Id.* Caterpillar explains that [] *Id.* at 265.

Wirtgen replies, in part, that Caterpillar's argument is "contradicted by the evidence" and that Caterpillar's machines do not need to be a "direct copy" of Wirtgen's machines or the '309 Patent. *See* Wirtgen Reply at 86-87.

Caterpillar replies that "Although Wirtgen tries []
Wirtgen never disputes that Caterpillar did not, in fact, copy Wirtgen's 'four-way full floating axle system' feature Wirtgen did not rebut []
]." Caterpillar Reply at 85.

Having considered the parties' arguments, the administrative law judge has determined that Wirtgen has presented some evidence of copying. The evidence shows that []
[] The documentary evidence also shows that []

[] *See* CX-0564C (CPLN Trade-Off Kick-Off) at 107; Engelmann Tr. 687-688; CX-0568C (PM600 Hydraulics Presentation) at 3, 5. While Caterpillar argues that the PM-465 already included the technology it is accused of copying, Caterpillar did not present any anticipation or obviousness argument based on this piece of prior art. Similarly, Caterpillar's argument that []

[] *See Wyers*, 616 F.3d at 1246 ("Our case law holds that copying requires

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evidence of efforts to replicate a specific product, which may be demonstrated through . . . access to the patented product combined with substantial similarity to the patented product.”).

2. Commercial Success

“‘[W]hen a patentee can demonstrate commercial success, usually shown by significant sales in a relevant market, and that the successful product is the invention disclosed and claimed in the patent, it is presumed that the commercial success is due to the patented invention.’”

Ormco Corp. v. Align Tech., Inc., 463 F.3d 1299, 1312 (Fed. Cir. 2006) (quoting *J.T. Eaton & Co. v. Atlantic Paste & Glue Co.*, 106 F.3d 1563, 1571 (Fed. Cir. 1997)); see also *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995) (“‘A *prima facie* case of nexus is generally made out when the patentee shows both that there is commercial success, and that the thing (product or method) that is commercially successful is the invention disclosed and claimed in the patent.’”) (quoting *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988)). On the other hand, “‘[i]f the commercial success is due to an unclaimed feature of the device’ or ‘if the feature that creates the commercial success was known in the prior art, the success is not pertinent.’” *Ethicon Endo-Surgery, Inc. v. Covidien LP*, 812 F.3d 1023, 1034 (Fed. Cir. 2016) (quoting *Ormco*, 463 F.3d at 1312).

For the nexus requirement, the Federal Circuit has explained that:

A nexus between commercial success and the claimed features is required. . . . However, if the marketed product embodies the claimed features, and is coextensive with them, then a nexus is presumed and the burden shifts to the party asserting obviousness to present evidence to rebut the presumed nexus. . . . The presumed nexus cannot be rebutted with mere argument; evidence must be put forth.

Brown & Williamson Tobacco Corp. v. Philip Morris Inc., 229 F.3d 1120, 1130 (Fed. Cir. 2000)

(citations omitted).

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Wirtgen's entire argument is:

The '309 patent relates to a technical feature of the DI milling machines that is sometimes referred to as a "four way floating axle," "four-way full floating," or "ride control." CX-0005C (Lumkes Rebuttal WS) Q430. This feature, which involves an interconnection of four hydraulic leg cylinders, enables improved stability during operation. CX-0005C (Lumkes Rebuttal WS) Q431. As discussed above with respect to the leveling technology claimed in '530 patent, the leveling technology claimed in the '309 patent was touted in Wirtgen America's marketing materials, related to substantial economic gains, and responsible for [

] CX-0009C (Mulhern Rebuttal WS) Q55-70.

Increased stability is critical in road milling machines, which are notoriously top heavy and can be prone to tipping over given their narrow construction. Reducing the chances of tipping over on a job site is vital because, if a milling machine tips over, in addition to the possible loss of life and bodily injury, righting and removing such a machine can cause significant delays on a jobsite, costing a contractor tens of thousands of dollars. And righting a tipped-over machine is expensive. The machine can weigh around 100,000 pounds. So expensive heavy equipment, such as a crane, is required to right the machine. The four-way floating axle feature is [

] CX-0005C (Lumkes Rebuttal WS) Q432.

Wirtgen Br. at 259.

Caterpillar argues:

Wirtgen's assertion that the '309 patent has led to commercial success for its machines is also unsupported by evidence. Wirtgen provides no specific evidence of a nexus between the alleged commercial success of its products and the *specific features* recited in claims 10, 29, and 36 of the '309 patent. Instead, Wirtgen's economic expert Carla Mulhern simply opines that Wirtgen touts its "four-way floating axle" in its advertising materials, but she provides not detailed explanation of how any alleged commercial success is tied to the specific limitations of claims 10, 29, and 36. CX-0009C (Mulhern Rebuttal WS) at Q/A 48-70. Without this showing of nexus, Wirtgen's alleged commercial success has no legal bearing on the question of whether claims 10, 29, and 36 of the '309 patent were obvious at the time of the invention. Indeed, Wirtgen has not shown that a single customer has made a purchasing

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decision for a cold planer based on the specific limitations recited these claims. Accordingly, Wirtgen has failed to establish “commercial success” as a relevant secondary consideration for these claims.

Caterpillar Br. at 265.

Wirtgen replies that “[n]ot only did Wirtgen America emphasize [the four-way floating axle] in marketing materials, this feature correlated with substantial economic gains and produced []” Wirtgen Reply at 87.

Having considered the parties’ arguments, the administrative law judge has determined that Wirtgen has made a modest showing that its products were a commercial success due to the features described in the ‘309 Patent.³⁵ In particular, Wirtgen has shown that features related to the claims generally appear in its advertising and that customers in the industry value the increased stability delivered by the ‘309 Patent. *See* CX-0005C (Lumkes WS) at Q/A 254-56; CX-0009C (Mulhern RWS) Q/A 58; CX-0176 (W210-W210i Brochure) at 25; *see also Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1055 (Fed. Cir. 2016) (“It is likewise reasonable to conclude that advertising that highlights or focuses on a feature of the invention could influence customer purchasing decisions.”). Wirtgen’s showing, however, is not particularly strong because there is scant evidence that consumers purchased the machines because of this feature.³⁶

³⁵ To support its commercial success argument, Wirtgen points to sales of its DI products since 2014. CX-0009C (Mulhern RWS) at Q/A 18-19 (identifying [] machine sales totaling \$[] million in revenue). For the ‘309 Patent, Ms. Mulhern identifies [] machine sales, which totaled \$[] million in revenue. *Id.* at Q/A 19. Caterpillar does not dispute the significance of the sales volume and revenue. *See* Caterpillar Br. at 56-57.

³⁶ Wirtgen has argued it is entitled to a presumption on nexus. *See* Wirtgen Br. at 197 (addressing the ‘641 Patent). However, the very authority it cites, *WBIP v. Kohler*, says that there is no presumption “where the patented invention is only a component of the product to which the asserted objective considerations are tied.” *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317,

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Accordingly, the administrative law judge has determined that the evidence Wirtgen has presented is slightly probative of commercial success.

3. Weighing the Secondary Considerations

On the whole, the administrative law judge has determined that the secondary considerations do not provide a material rebuttal to an obviousness argument, as the evidence of copying and commercial success is modest, and the industry-praise evidence does not support Wirtgen's arguments. In any event, a rebuttal is not necessary because Caterpillar has not shown that the asserted claims are *prima facie* obvious. See *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1348-49 (Fed. Cir. 2012).³⁷

1329 (Fed. Cir. 2016). Because the four-way floating axle is a component of the machine, and is not coextensive with the machine, Wirtgen is not entitled to a nexus presumption.

Ms. Mulhern discusses several Caterpillar documents that indicates []. See CX-0009C (Mulhern WS) at Q/A 61. However, Ms. Mulhern's testimony at Q/A 60-70 does not establish that the feature drove sales. Further, Mr. McEvoy, Wirtgen America's CEO, testified that customers buy Wirtgen products because its machines include a "number of" features and because of Wirtgen America's (claimed) superior product support. See CX-0003C (McEvoy WS) at Q/A 25 (testifying that customers buy Wirtgen products because "... Second, Wirtgen America's product support is the best in the industry."); see also CX-0008C (Mulhern WS) at Q/A 102 (discussing 23,500 technical support calls received since 2014); CX-0002C (Schmidt WS) at Q/A 69 (explaining that Wirtgen's technical support is available 24 hours a day, seven days a week and that "As soon as Wirtgen America receives a communication from a customer, the technical staff put the wheels in motion to address the issue."); RX-0989C (Reed RWS) at Q/A 150 (Wirtgen has been the leading supplier of milling equipment for decades."), Q/A 155-56 ("Ms. Mulhern has not shown a temporal link between sales growth and the patented features.").

³⁷ In *Transocean*, the Federal Circuit explained: "The establishment of a *prima facie* case, however, is not a conclusion on the ultimate issue of obviousness. By definition, the existence of a *prima facie* case simply means that the party challenging a patent has presented evidence 'sufficient to establish a fact or raise a presumption [of obviousness] unless disproved or rebutted.' Black's Law Dictionary (9th ed. 2009). The *prima facie* inquiry is based on the first three *Graham* factors—the scope and content of the prior art, the differences between the prior art and the claims, and the level of ordinary skill in the art—which the Supreme Court described as the background against which the obviousness or nonobviousness of the subject matter is determined. 383 U.S. at 17, 86 S.Ct. 684. A party is also free to introduce evidence relevant to

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V. U.S. Patent No. 7,530,641

A. Overview of the '641 Patent (JX-0004)

The '641 Patent, entitled "Automotive construction machine, as well as method for working ground surfaces" issued on May 12, 2009. The application that would issue as the '641 Patent, Application No. 11/802,277, was filed on May 22, 2007, and claims priority to German Application No. DE 10 2006 024 123, which was filed on May 22, 2006. In general, the '641 Patent concerns operating a road-milling machine in reverse without uncoupling the milling drum. *See generally* JX-0004 at Abstract, 1:5-2:15.

Wirtgen asserts claims 1, 7, 11, and 17. *See* Wirtgen Br. at 142. Claims 1, 7, 11, and 17 are reproduced below:

1. Automotive construction machine (1) for working ground surfaces (2),
 - with a machine frame (4),
 - with a drive engine (6) for driving traveling devices (8) and for driving working devices, and
 - with a milling drum (12) for milling the ground surfaces (2), which is capable of being raised and is driven by and capable of being uncoupled from the drive engine (6),
 - where the milling drum (12) is capable of being moved into a raised position when it is not in milling mode,
 - characterized in that,
 - the milling drum (12) remains coupled with the drive engine (6) when in raised position and with a direction of travel in which the rotating direction of the milling drum (12) corresponds to the rotating direction of the traveling devices (8), and

the fourth *Graham* factor, objective evidence of nonobviousness, which may be sufficient to disprove or rebut a prima facie case of obviousness. *See Mintz v. Dietz & Watson, Inc.*, 679 F.3d 1372, 1378-79 (Fed. Cir. 2012)." 699 F.3d at 1348-49.

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a monitoring device (14) monitors a distance between the milling drum (12) and the ground surface (2) and uncouples the raised milling drum (12) from the drive engine (6) and/or uncouples the traveling devices (8) from the drive engine (6) and/or raises the machine frame (4) and/or generates an alarm signal when the monitoring device (14) detects a deviation that falls below a pre-determined distance.

* * *

7. Construction machine (1) in accordance with claim 1, characterized in that at least one sensing device capable of being lowered relative to the raised milling drum (12) is arranged at the milling drum (12) in such a manner that the sensing device projects vis-a-vis the milling drum (12) towards the ground surface (2) by a pre-determined distance, and in that the monitoring device (14), in the raised position of the milling drum (12) and the simultaneously lowered position of the sensing device, uncouples at least the milling drum (12) from the drum drive (10) when the monitoring device (14) detects a contact of the at least one sensing device with the ground surface (2) or that the at least one sensing device is raised by the ground surface (2).

* * *

11. Method for working ground surfaces (2) with a construction machine (1) that is automotive by means of traveling devices (8) and in which a milling drum (12) supported in a machine frame (4) is driven by a drive engine (6),

where the milling drum (12) is moved into a raised position when it is not in milling mode,

characterized in that,

the milling drum (12) remains coupled with the drive engine (6) when in raised position and with a direction of travel in which the rotating direction of the milling drum (12) corresponds to the rotating direction of the traveling devices (8),

in that a distance is monitored between the rotating, raised milling drum (12) and the ground surface (2) or an obstacle located in front of the milling (12) when seen in the direction of travel, and

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in that the milling drum (12) is uncoupled from the drive engine (6), and/or the traveling devices (8) are uncoupled from the drive engine (6) and/or the machine frame (4) is raised and/or an alarm signal is generated when detecting that the deviation falls below a pre-determined distance between the milling drum (12) and the ground surface (2).

* * *

15. Method in accordance with claim 11, characterized in that the milling drum (12) is raised by a pre-determined amount that is larger than a minimum distance between the milling drum (12) and the ground surface (2), and in that a sensing device measuring towards the ground surface (2) takes a lower limit position which corresponds to a pre-determined distance or to a minimum distance to be maintained between the milling drum (12) and the ground surface (2).

* * *

17. Method in accordance with claim 15, characterized in that a scraper blade (22) that is arranged behind the milling drum (12) when seen in the direction of travel is used as a sensing device.

JX-0004 at 6:55-8:67.

B. Claim Construction

1. Level of Ordinary Skill in the Art

For all of the asserted patents, Wirtgen argues:

Wirtgen America submits that a person of ordinary skill in the art as of the filing dates of the Asserted Patents is one who has either: (1) a bachelor's degree (or equivalent) in mechanical engineering or a similar field, and two to five years of experience working on mobile construction machine design or in a similar field; or (2) seven to ten years of experience working on mobile construction machine design or in a similar field. Caterpillar similarly contends that a person of ordinary skill in the art would have either: (1) a bachelor's degree in mechanical engineering or an equivalent degree, and two to five years of experience working on mobile construction machine design, or (2) seven to ten years of experience working on mobile construction machine design. Accordingly, the parties have effectively no dispute over the level of ordinary skill in the art.

Wirtgen Br. at 25.

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Caterpillar argues:

A person of ordinary skill in the art at the time of the alleged invention in the '309 patent would have had: 1) a bachelor's degree in mechanical engineering or an equivalent degree, and two to five years of experience working on mobile construction machine design, or machines of comparable complexity; or 2) seven to ten years of experience working on mobile construction machine design. RX-0985C at Q/A 751. Wirtgen's proposed level of skill in the art is not materially different, and neither party has argued that the outcome of this case depends on which party's POSITA definition is adopted.

Caterpillar Br. at 229. Caterpillar proposes the same level of ordinary skill for the '340, '530, and '641 Patents. *Id.* at 20 (addressing the '340 Patent), 75 (addressing the '530 Patent), 152 (addressing the '641 Patent).

The administrative law judge has determined that a person of ordinary skill in the art would have (1) a bachelor's degree (or equivalent) in mechanical engineering or a similar field, and two to five years of experience working on mobile construction machine design or in a similar field or (2) seven to ten years of experience working on mobile construction machine design. *See* CX-0006C (Meyer WS) at Q/A 31; RX-0985C (Alleyne WS) at Q/A 751; *see also* Part IV(B)(1), *supra*.

2. Disputed Constructions

The parties dispute the following two terms and paragraph:

- "working devices" (claim 1)
- "monitoring device (14) monitors a distance between the milling drum (12) and the ground surface (2) and uncouples the raised milling drum (12) from the drive engine (6) and/or uncouples the traveling devices (8) from the drive engine (6) and/or raises the machine frame (4) and/or generates an alarm signal when the monitoring device (14) detects a deviation that falls below a pre-determined distance" (claim 1)
- "deviation" (claims 1, 11)

See Caterpillar Br. at 153; Wirtgen Initial Claim Construction Br. at 35-41.

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a) “working devices”

Claim 1 recites an “Automotive construction machine for working ground surfaces, with a machine frame, with a drive engine for driving traveling devices and for driving *working devices*, and with a milling drum for milling the ground surfaces[.]” JX-0004 at 6:55-61 (emphasis added, reference numerals omitted).

The parties propose the following constructions:

Wirtgen’s Proposed Construction	Caterpillar’s Proposed Construction
“the milling drum and devices that drive the milling drum”	“devices for working a ground surface”

See Wirtgen Initial Claim Construction Br. at 35; Caterpillar Br. at 153.

Wirtgen argues that a “person of ordinary skill in the art reading the ‘641 patent would understand that the working devices include the milling drum and devices that drive the milling drum.” Wirtgen Initial Claim Construction Br. at 35. Wirtgen argues that “the drive engine, the traveling devices, and the monitoring devices” are not working devices because “claim 1 and the specification distinguish the working devices” from these components. *Id.* at 36 (citing JX-0004 at 6:58-59, 7:4-11). Wirtgen also argues that Caterpillar’s proposed construction does not provide any meaning “that is not already provided by the term ‘working devices.’” *Id.*

Caterpillar argues that the ordinary meaning of “working devices” is “devices for working a ground surface.” Caterpillar Initial Claim Construction Br. at 41. Caterpillar relies on Figure 1, which depicts a machine in “working mode,” as an example of how “milling drum 12 works the ground surface.” *Id.* Caterpillar also notes the specification states that “[t]he main working device consists of a milling drum 12 for milling the ground surface 2.” *Id.* (citing JX-0004 at 4:38-39). Caterpillar argues that Wirtgen’s proposed construction “should be rejected

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because it improperly encompasses additional equipment, namely ‘devices that drive the milling drum,’ that are not used to work a ground surface.” *Id.* at 42.

Wirtgen replies that it “explained that the drive engine was not among the “devices that drive the milling drum” according to Wirtgen America’s proposed construction. The drive engine drives the drum drive, which in turn drives the milling drum, aided by the coupling. There is no redundancy.” Wirtgen Reply Claim Construction Br. at 18.

Caterpillar replies that Wirtgen’s construction is “redundant and nonsensical” and that “Wirtgen has cited no evidence in the specification that a ‘working device’ can be something that does not work a ground surface, *i.e.*, like the drive engine.” Caterpillar Reply Claim Construction Br. at 22-23.

The administrative law judge construes “working devices” to mean “the milling drum and devices that drive the milling drum.”

The language of claim 1 informs the reader that a working device does not include a drive engine and is not limited to a milling drum, as these separate components are specifically mentioned elsewhere in claim 1.³⁸ The specification and the figures further delineate the construction. In particular, Figure 1 depicts the milling drum as the only component that contacts the ground surface in working mode. *See* JX-0004, Fig. 1. The specification states:

The automotive construction machine 1 for working ground surfaces 2 shown in FIG. 1 shows a machine frame 4, as well as a drive engine 6 for driving traveling devices 8 and for driving working devices. In the embodiment in FIG. 1, the traveling devices 8 consist of wheels, whereas in the embodiment in FIG. 3, the said traveling devices 8 consist of crawler track units. ***The main working device consists of a milling drum 12*** for milling the ground surface 2,

³⁸ The claim recites an “Automotive construction machine (1) for working ground surfaces (2), with a machine frame (4), with a ***drive engine*** (6) for driving traveling devices (8) and for driving ***working devices***, and with a ***milling drum*** (12) for milling the ground surfaces (2)” JX-0004 at 6:55-61 (emphasis added on distinct words).

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where the said milling drum 12 is capable of being driven by a drum drive 10 and of being uncoupled from the drive engine 6.

JX-0004 at 4:38-41 (emphasis added). Thus, the specification explains that the drive engine is not part of the “working devices” and that the “main” working device is the milling drum. The specification also explains that when the milling drum is raised out of a cut, the milling drum remains coupled with the drive engine via the drum drive and a coupling. *Id.* at 4:50-53. This discussion explains how the engine drives the working devices, which supports the construction.

In addition, Caterpillar’s proposed construction does not further the understanding of the disputed term and improperly adds a limitation that the working devices must contact the ground.³⁹

- b) ***“monitoring device (14) monitors a distance between the milling drum (12) and the ground surface (2) and uncouples the raised milling drum (12) from the drive engine (6) and/or uncouples the traveling devices (8) from the drive engine (6) and/or raises the machine frame (4) and/or generates an alarm signal when the monitoring device (14) detects a deviation that falls below a pre-determined distance”***

Claim 1 recites an automotive construction machine that includes a monitoring device.

JX-0004 at 7:4-11. This contested paragraph is the last paragraph in claim 1.

The parties propose the following constructions:

Wirtgen’s Proposed Construction	Caterpillar’s Proposed Construction
“a component with one or more sensors or switches monitors a distance between the milling drum and the ground surface and performs at least one of: (a) uncoupling the raised milling drum from the drive	This is a means-plus-function limitation. <i>See Williamson v. Citrix Online, LLC</i> , 792 F.3d 1339 (Fed. Cir. 2015). <u>Function:</u> to monitor a distance between

³⁹ Caterpillar’s application of the term for its non-infringement argument shows that Caterpillar seeks to add a limitation that the working device(s) must be in contact with the ground. *See, e.g., Caterpillar Br.* at 201 (in arguing non-infringement, Caterpillar states that apart from the milling drum “Wirtgen has not proven that any other component of the accused Caterpillar machines can work the ground surface.”).

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engine, (b) uncoupling the traveling devices from the drive engine, (c) raising the machine frame, and (d) generating an alarm signal, when the monitoring device detects a deviation that falls below a pre-determined distance.”	<p>the milling drum and the ground surface and, upon detecting a deviation that falls below a pre-determined distance, (1) uncouple the raised milling drum from the drive engine, (2) uncouple the traveling devices from the drive engine, (3) raise the machine frame, and/or (4) generate an alarm signal.</p> <p><u>Corresponding Structure:</u> No algorithm, circuit, or other structure is disclosed for performing the claimed function; therefore, the claim is indefinite.</p>
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See Wirtgen Initial Claim Construction Br. at 37-38; Caterpillar Br. at 153.

Wirtgen argues that this paragraph:

[Is] not a means-plus-function term and, regardless, the specification discloses sufficient structure. As the patent figures indicate, the monitoring device is the object with reference number 14. The specification discloses several example structural embodiments of the monitoring device, ‘641 patent 3:45-65, as well as several specific operations. See ‘641 patent 3:25-35; *see also* ‘641 patent 2:57-58 (describing monitoring through the machine device); 2:65-67 (describing direct and indirect monitoring via at least one sensor); 3:25-30 (describing a function of the sensor within the monitoring device); 3:20-45 (describing the interaction between the monitoring device/sensor and the sensing device/tracer); 3:49 (describing an example sensor as a sound sensor or path sensor and describing an alternative monitoring device as a limit switch); Velinsky at ¶75.

The extent and detail of the description of different structural and operational embodiments of the monitoring device throughout the specification would inform a person of ordinary skill in the art that the word “monitoring device” was the name of a structure. It would also inform a person of ordinary skill in the art of how that structure is internally configured and how it interacts with the other structures in the milling machine. Velinsky at ¶74.

Wirtgen Initial Claim Construction Br. at 38-39.

Caterpillar argues that the paragraph is “not claimed based on its structure but rather on what it does” and that “a person of ordinary skill in the art at the time of the claimed invention

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would not have been able to determine anything about the claimed monitoring device except the functions it performs, *i.e.*, that it monitors a distance between the milling drum and the ground surface and, upon detecting a deviation that falls below a pre-determined distance, performs one of the four claimed functions.” Caterpillar Initial Claim Construction Br. at 44-47. Caterpillar further argues that the claim is indefinite because the specification does not disclose sufficient structure corresponding to the monitoring device and all of its associated functions. *Id.* at 47-51.

Wirtgen replies, in part:

Although the term “device” might be a placeholder term in some contexts, it is not in the context of this patent and these claims because it does not merely refer to a way of monitoring something. It refers to the particular, well-known configuration of sensors and switches described in the various embodiments, illustrated in Figures 1 and 2, and used in commercial milling machines. The monitoring devices are well-known structures in milling machines and Respondents have not provided any evidence that they are not. Ex. 1 at ¶24.

Wirtgen Reply Claim Construction Br. at 21.

Caterpillar replies that the specification does not disclose structures or algorithms for all of the functions recited in the disputed paragraph. *See* Caterpillar Reply Claim Construction Br. at 24-27.

Wirtgen’s supplemental claim construction brief argues that “the monitoring device is a ‘thing’—a particular thing in the claimed construction machine.” Wirtgen Supp. Claim Construction Br. at 4. Wirtgen also cites *Inventio AG v. ThyssenKrupp Elevator Americas Corp.*, 649 F.3d 1350, 1359-1360 (Fed. Cir. 2011) as an example of a case that found that the term “computing unit” was “sufficiently structural because the written description described how it was connected to the other components in the claimed system and the steps that it performs.” *Id.*

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(1) The “monitoring device” paragraph is subject to § 112(6)

The administrative law judge has determined that the disputed paragraph—“a monitoring device (14) monitors a distance between the milling drum (12) and the ground surface (2) and uncouples the raised milling drum (12) from the drive engine (6) and/or uncouples the traveling devices (8) from the drive engine (6) and/or raises the machine frame (4) and/or generates an alarm signal when the monitoring device (14) detects a deviation that falls below a pre-determined distance.”—is functionally claimed. In *Williamson*, the Federal Circuit explained:

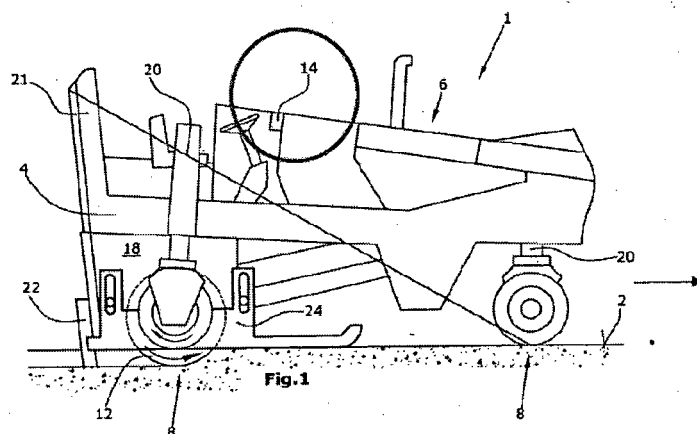
In making the assessment of whether the limitation in question is a means-plus-function term subject to the strictures of § 112, para. 6, our cases have emphasized that the essential inquiry is not merely the presence or absence of the word “means” but whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure.

Williamson v. Citrix Online, LLC, 792 F.3d 1339, 1348 (Fed. Cir. 2015); *see also Phillips v. AWH Corp.*, 415 F.3d 1303, 1311 (Fed. Cir. 2005) (“Means-plus-function claiming applies only to purely functional limitations that do not provide the structure that performs the recited function.”). Here, the term “monitoring device” does not have a sufficiently definite meaning such that a person of ordinary skill in the art would understand what structure the term refers to, particularly where the disputed paragraph uses six verb phrases (monitor a distance, uncouple a milling drum, uncouple traveling devices, raise a machine frame, generate an alarm, and detect a deviation) to explain what a monitoring device can do. *See id.*; *see also Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014) (the specification and prosecution history must “inform those skilled in the art about the scope of the invention with reasonable certainty”). Simply put, the specification is ambiguous as to what the claimed monitoring device is and what components it includes, such that a person of ordinary skill could not identify a structure for the monitoring device. *See Williamson*, 792 F.3d at 1348 (quoting *Greenberg v. Ethicon Endo-*

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Surgery, Inc., 91 F.3d 1580, 1584 (Fed. Cir. 1996) for the proposition that “What is important is . . . that the term, as the name for structure, has a reasonably well understood meaning in the art.”).

The specification and figures do not assist a person of ordinary skill in the art in identifying a structure. For example, Figure 1 contains the following image a monitoring device:



JX-0004, Fig. 1 (red annotation added). Figure 2 contains the same block depiction of the monitoring device; Figures 3 and 4 do not show the monitoring device. *See generally* JX-0004. Thus, the figures do not depict a structure that would indicate that the monitoring device has a reasonably well-known structure, or that the disputed paragraph is not functionally claimed.

While the specification does associate some structures with the claimed function (which are discussed in subsequent subsections of this Initial Determination), the specification does not indicate that a “monitoring device” is a structure that has a reasonably well understood meaning in the art—particularly where the monitoring device is expected to perform the six functions recited in the disputed paragraph. For example, in describing how the monitoring device measures distance, the specification refers to generic “mechanical or electronic” means for measuring:

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Monitoring of the pre-determined distance by the monitoring device can be effected either directly or indirectly. Direct measuring is effected, for instance, *by means* of mechanical or electronic measurement of the distance, whereas indirect measuring of the distance can be effected, for instance, via machine elements of the construction machine, via tracers or via the actual position of the lifting column carrying the machine frame.

JX-0004 at 2:57-64 (emphasis added). Likewise, in describing uncoupling the milling drum from the drive train, the specification explains that the “milling drum is capable of being uncoupled from the drive train *by means* of a coupling.” *Id.* at 1:17-19 (emphasis added). These portions of the specification indicates that the “monitoring device” is not a reasonably well-known structure given the numerous sub-components detailed in the specification.

Accordingly, the disputed paragraph is subject to § 112(6).

(2) The functions recited in the “monitoring device” paragraph

“Construing a means-plus-function claim term is a two-step process. The court must first identify the claimed function.” *Williamson*, 792 F.3d at 1351. Here, the “monitoring device” paragraph requires that the monitoring device perform these six functions:

- 1) monitor a distance between the milling drum and the ground surface;
- 2) uncouple the raised milling drum from the drive engine;
- 3) uncouple the traveling devices from the drive engine;
- 4) raise the machine frame;
- 5) generate an alarm signal (when the monitoring device detects a deviation); and
- 6) detect a deviation that falls below a pre-determined distance.

See JX-0004 at 7:4-11; *see also* Velinsky Decl., ¶¶ 71-72 (identifying five functions, where generating an alarm and detecting a deviation are treated as a single function).

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- (3) The structures corresponding to the functions recited in the “monitoring device” paragraph

After identifying the claimed function, “the court must determine what structure, if any, disclosed in the specification corresponds to the claimed function.” *Williamson*, 792 F.3d at 1351-52 (citing *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1311 (Fed. Cir. 2012)). “Where there are multiple claimed functions, as we have here, the patentee must disclose adequate corresponding structure to perform all of the claimed functions. . . . If the patentee fails to disclose adequate corresponding structure, the claim is indefinite.” *Id.*

To begin, the specification (including the figures) never clearly specifies a structure for the monitoring device itself. *See generally* JX-0004; *see also* RX-0985C (Alleyne WS) at Q/A 732. While the specification articulates components that a monitoring device interacts with, the specification does not clarify that those components are part of the monitoring device. For example, in discussing monitoring a pre-determined distance, the specification states:

Monitoring of the pre-determined distance by the monitoring device can be effected either directly or indirectly. Direct measuring is effected, for instance, by means of mechanical or electronic measurement of the distance, whereas indirect measuring of the distance can be effected, for instance, via machine elements of the construction machine, via tracers or via the actual position of the lifting column carrying the machine frame.

When doing so, the pre-determined distance between the raised milling drum and the ground surface can be monitored with at least one sensor.

JX-0004 at 2:57-67. Based on this passage, the reader is left to conclude that the monitoring device could have an undefined direct measuring “means” or that measurement is performed with components that are not part of the monitoring device’s structure. *See id.* This is not a sufficient identification of structure. *See Default Proof Credit Card Sys., Inc. v. Home Depot U.S.A., Inc.*, 412 F.3d 1291, 1299 (Fed. Cir. 2005) (“To meet the definiteness requirement,

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structure disclosed in the specification must be clearly linked to and capable of performing the function claimed by the means-plus-function limitation.”).

Beyond the structure of the monitoring device, the specification does not sufficiently disclose algorithms for all of the recited functions. For example, the specification does not disclose how the monitoring device uncouples the milling drum or uncouples the traveling devices. The specification also does not disclose an algorithm for how the monitoring device raises the machine frame.⁴⁰ The lack of disclosure for at least these three functions renders the ‘641 Patent indefinite. *See Noah Sys.*, 675 F.3d at 1311; *Media Rights Techs., Inc. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1374 (Fed. Cir. 2015) (“Where there are multiple claimed functions, as there are in this case, the patentee must disclose adequate corresponding structure to perform all of the claimed functions.”). Accordingly, the administrative law judge has determined that Caterpillar has shown that claims 1 and 7 are indefinite.⁴¹

c) “deviation”

Claim 1 requires that the monitoring device “detects a deviation that falls below a pre-determined distance.” JX-0004 at 7:10-11.

The parties propose the following constructions:

Wirtgen’s Proposed Construction	Caterpillar’s Proposed Construction
“the monitored distance”	“the difference between a variable and a set point”

See Wirtgen Initial Claim Construction Br. at 37-38; Caterpillar Br. at 154.

⁴⁰ While raising the frame was known in the prior art, it is not clear that a monitoring device was used to raise the frame.

⁴¹ Caterpillar has met its burden under the preponderance-of-the-evidence standard and the clear-and-convincing standard.

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Wirtgen argues, in part:

The word “deviation” typically denotes *a change or difference* among values. In the context of claims 1 and 11 of the ‘641 patent, it is clear that the word deviation is referring to a particular deviation, namely the monitored distance. This is consistent with the way the word “deviation” is used in the specification. See ‘641 patent 2:21-27 (describing monitoring the deviation as monitoring whether the distance falls below a preset limit); 3:55-62 (describing the deviation as the “minimum distance”); Velinsky at ¶75.

Wirtgen Initial Claim Construction Br. at 40 (emphasis added). Wirtgen then critiques Caterpillar’s proposed construction. *Id.* at 40-41.

Caterpillar argues:

... As is clearly recited in this claim language, the monitoring device “monitors a distance between the milling drum and the ground surface.” This is the “monitored distance” to which Wirtgen’s proposed construction refers. But the monitored distance is not the parameter that triggers the four alternative actions in this claim. Rather, those actions are triggered when the monitoring device detects “a deviation that falls below a predetermined distance.” The term “deviation” cannot simply be equated with the monitored distance because these are two separate terms that are distinctly and separately recited in the claim. *See Bicon*, 441 F.3d at 950 (“claims are interpreted with an eye toward giving effect to all terms in the claim”); *see also Bancorp Servs., L.L.C. v. Hartford Life Ins. Co.*, 359 F.3d 1367, 1373 (Fed. Cir. 2004) (“[T]he use of [two] terms in close proximity in the same claim gives rise to an inference that a different meaning should be assigned to each.”); *Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1382 (Fed. Cir. 2008) (“[D]ifferent claim terms are presumed to have different meanings”).

Caterpillar Initial Claim Construction Br. at 52. Caterpillar also argues: “In short, a “deviation” can never be just a measured value by itself. Rather, *it is the difference* between a measured value and some other value such as a control parameter, a setpoint, or an average.” *Id.* at 53 (emphasis added). Caterpillar contends that Wirtgen’s claim construction “reads ‘deviation’ completely out of the claim.” *Id.* at 55.

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Wirtgen replies:

The monitoring device monitors the distance between the work drum and the ground surface. It is unsafe for the milling drum to touch the ground while the machine is, for example, driving in reverse and not milling the ground surface. As the milling machine traverses uneven ground or objects such as rocks or manhole covers, the distance between the work drum and the surface will deviate. The monitoring device monitors those deviations, and takes responsive action whenever the distance between the work drum and the ground surface (the monitored distance) falls below a certain pre-determined safety threshold.

The deviation recited in the claim is therefore the distance between the road surface and the work drum. If one was to substitute the words “monitored distance” for the word “deviation” in this claim, one of skill in the art would understand the scope of the claim to remain the same, because the particular deviation that triggers the responsive action of the monitoring device is when the monitored distance falls below a pre-determined threshold. . . .

Wirtgen Reply Claim Construction Br. at 22.

Caterpillar replies:

Wirtgen concedes that “the word ‘deviation’ typically denotes a change or difference among values,” yet it argues for a definition that completely excludes this concept. Wirtgen points to no evidence in the intrinsic record showing that the inventors acted as their own lexicographers by giving “deviation” a definition that is contrary to its ordinary meaning. Thus, Wirtgen has failed to overcome the presumption that “deviation” should be construed according to its ordinary meaning.

Caterpillar Reply Claim Construction Br. at 27. Caterpillar later adds that “The word ‘deviation’ is ordinarily defined as ‘an abnormality; a departure’ or ‘[t]he difference . . . between one number in a set and the mean of the set.’” *Id.* at 28 (emphasis added).

Having considered the parties’ arguments, the administrative law judge construes “deviation” to mean “a change, difference, or departure.” The claims and the specification do not suggest a particular meaning for the term; there is no reason to depart from the term’s typical

use, which the parties both argue focuses on a difference.⁴² Further, construing “deviation” to mean “a change, difference, or departure” provides a basis for determining infringement and validity that does not introduce redundancies or introduce extraneous technical words (*i.e.*, “variable” or “set point”).

C. Infringement

Wirtgen argues that Caterpillar’s PM600, PM800, and PM300 series machines literally infringe claims 1 and 7. Wirtgen Br. at 141. Wirtgen also argues that “Caterpillar induces infringement of claims 11 and 17 by promoting and encouraging its customers to use its reverse travel shut-off feature.” *Id.* Wirtgen does not argue infringement under the doctrine of equivalents. *See generally id.* at 141-57.

1. Claim 1

For its infringement analysis, Wirtgen divides claim 1 into ten limitations, as follows:

1[p] 1. Automotive construction machine (1) for working ground surfaces (2),

1[a] with a machine frame (4),

1[b] with a drive engine (6) for driving traveling devices (8) and for driving working devices, and

1[c] with a milling drum (12) for milling the ground surfaces (2),

1[d] which is capable of being raised and

1[e] is driven by and capable of being uncoupled from the drive engine (6),

1[f] where the milling drum (12) is capable of being moved into a raised position when it is not in milling mode,

1[g] characterized in that, the milling drum (12) remains coupled with the drive engine (6) when in raised position and with a direction

⁴² For infringement, Wirtgen eventually argues: “Both constructions are satisfied by the same general conditions, structures, movements, and distances.” Wirtgen Reply at 56.

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of travel in which the rotating direction of the milling drum (12) corresponds to the rotating direction of the traveling devices (8), and

1[h] a monitoring device (14) monitors a distance between the milling drum (12) and the ground surface (2) and

1[i] uncouples the raised milling drum (12) from the drive engine (6) and/or uncouples the traveling devices (8) from the drive engine (6) and/or raises the machine frame (4) and/or generates an alarm signal when the monitoring device (14) detects a deviation that falls below a pre-determined distance.

See CDX-0002 (Meyer Demonstratives) at 138-59; CX-0006C (Meyer WS) at Q/A 432-517.

Each limitation is addressed below.

a) 1[p] 1. Automotive construction machine for working ground surfaces

Wirtgen argues that all of “the accused machines are automotive machines for working ground surfaces as recited in the preamble of claim 1.” Wirtgen Br. at 143.

Caterpillar does not clearly rebut this argument. See generally Caterpillar Br. at 201-17 (the limitation is not contested); Caterpillar Reply at 58-69 (same).

The evidence shows that the PM312 (which is representative of Caterpillar’s PM300 series products) and the PM620 (which is representative of Caterpillar’s PM600 and PM800 series products) are automotive construction machines that work ground surfaces. See CX-0006C (Meyer WS) at Q/A 432-36. Accordingly, the administrative law judge has determined that the PM312 and PM620 are automotive construction machines for working ground surfaces, as limitation 1[p] requires.

b) 1[a] with a machine frame

Wirtgen argues that the PM312 and PM620 each has a frame. See Wirtgen Br. at 143.

Caterpillar does not clearly rebut this argument. See generally Caterpillar Br. at 201-17 (the limitation is not contested); Caterpillar Reply at 58-69 (same).

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The evidence shows that the PM312 and PM620 are automotive construction machines that have machine frames. *See* CX-0006C (Meyer WS) at Q/A 438-40. Accordingly, the administrative law judge has determined that the PM312 and PM620 are automotive construction machines that include machine frames, as limitation 1[a] requires.

c) ***1[b] with a drive engine for driving traveling devices and for driving working devices***

For the PM620, Wirtgen argues:

The PM620's main engine drives a pump drive that powers a hydraulic pump, which in turn drives four crawler tracks—traveling devices—that are part of the propel system. . . . The PM620 diesel engine also drives a milling drum through a rotor drive system. . . . The engine also drives the hydraulic cylinders that raise and lower the side plates, which run along the ground surface during milling. It also drives the collecting and loading conveyors. Any of these devices may be among the recited “working devices.”

Wirtgen Br. at 143-44 (citations omitted). For the PM312, Wirtgen argues:

The PM312 engine similarly drives a milling drum through a rotor drive system—satisfying the working devices element. . . . Additionally, the PM312 engine also drives the traveling devices (which are driven by propulsion motors). The PM312's diesel engine also drives a belt drive, which in turn drives a milling drum.

Id. at 144.

Caterpillar argues that Wirtgen has not shown that the PM312 and PM620 include working devices. Caterpillar Br. at 201. Caterpillar argues that its machines contain just one milling drum, and thus lack multiple devices that contact the ground surface. *Id.* Caterpillar argues that the side plates are not working devices “because they do not work a ground surface.” *Id.* at 201-02. Caterpillar argues that the collecting and loading conveyors are not working devices because they do not touch the ground and because they are neither “the milling drum” nor “devices that drive the milling drum.” *Id.* at 202.

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(1) Analysis of the PM620

The evidence shows that the PM620 is an automotive construction machine that includes a main engine. *See* CX-0006C (Meyer WS) at Q/A 442; CX-0213 (PM620 Brochure) at 7, 12. The main engine in the PM620 drives a pump drive that powers a hydraulic pump, which in turn drives four crawler tracks that are part of the propulsion system. *Id.* The PM620's engine also drives a milling drum via a rotor drive. *Id.* Accordingly, the administrative law judge has determined that the PM620 includes an engine for driving traveling and working devices, as limitation 1[b] requires.

(2) Analysis of the PM312

The evidence shows that the PM312 is an automotive construction machine that includes a main engine. *See* CX-0006C (Meyer WS) at Q/A 449; CX-0049C (PM312 Technical Presentation) at 12, 299. The PM312's main engine drives the caterpillar track via propulsion motors. *Id.* The main engine also drives a milling drum through a rotor drive system. *Id.* Accordingly, the administrative law judge has determined that the PM312 includes an engine for driving traveling and working devices, as limitation 1[b] requires.

d) 1[c] with a milling drum for milling the ground surfaces

Wirtgen argues that the PM312 and PM620 each includes a milling drum that mills ground surfaces. *See* Wirtgen Br. at 144.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 201-17 (the limitation is not contested); Caterpillar Reply at 58-69 (same).

The evidence shows that the PM312 and PM620 are automotive construction machines that include milling drums for milling pavement. *See* CX-0006C (Meyer WS) at Q/A 457-58. Accordingly, the administrative law judge has determined that the PM312 and PM620 are

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automotive construction machines that milling drums for milling ground surfaces, as limitation 1[c] requires.

e) 1[d] which is capable of being raised and

Wirtgen argues that the PM312 and PM620 each includes a milling drum that is capable of being raised. *See* Wirtgen Br. at 144.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 201-17. (the limitation is not contested); Caterpillar Reply at 58-69 (same).

The evidence shows that the PM312 and PM620 each has a milling drum that can be raised. *See* CX-0006C (Meyer WS) at Q/A 457-58. Accordingly, the administrative law judge has determined that the PM312 and PM620 are automotive construction machines that milling drums that can be raised, as limitation 1[d] requires.

f) 1[e] is driven by and capable of being uncoupled from the drive engine

Wirtgen argues that the “PM620 and PM312 also include a milling drum that is ‘driven by and capable of being uncoupled from the drive engine (6)’ as recited in element 1[e].” *See* Wirtgen Br. at 144-45.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 201-17. (the limitation is not contested); Caterpillar Reply at 58-69 (same).

The evidence shows that the milling drums in the PM312 and PM620 are driven by main engines and capable of can be uncoupled from the main engine. *See* CX-0006C (Meyer WS) at Q/A 465-71. Accordingly, the administrative law judge has determined that the PM312 and PM620 are “driven by and capable of being uncoupled from the drive engine,” as limitation 1[e] requires.

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- g) *1[f] where the milling drum is capable of being moved into a raised position when it is not in milling mode***

Wirtgen argues that the milling drums in the PM620 and PM312 can be raised when they are not in milling mode. *See* Wirtgen Br. at 145-46.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 201-17 (the limitation is not contested); Caterpillar Reply at 58-69 (same).

The evidence shows that the milling drums in the PM620 and PM312 can be raised when they are not in milling mode. *See* CX-0006C (Meyer WS) at Q/A 472-76. Accordingly, the administrative law judge has determined that the PM312 and PM620 each includes a milling drum that is capable of being moved into a raised position when it is not in milling mode, as limitation 1[f] requires.

- h) *1[g] characterized in that, the milling drum remains coupled with the drive engine when in raised position and with a direction of travel in which the rotating direction of the milling drum corresponds to the rotating direction of the traveling devices***

Wirtgen argues that the milling drums in the PM620 and PM312 remain coupled with the main engine when raised and that “when the PM620 is traveling backwards and the milling drum is rotating, the milling drum’s rotational direction corresponds to the traveling device’s rotational direction, *i.e.*, both the drum and the tracks rotate counterclockwise.” *See* Wirtgen Br. at 146.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 201-17 (the limitation is not contested); Caterpillar Reply at 58-69 (same).

The evidence shows that the milling drums are coupled with the main engine when raised and that the milling drum and caterpillars rotate in the same direction when the machine travels in reverse. *See* CX-0006C (Meyer WS) at Q/A 481-85. Dr. Meyer explained:

The PM620’s milling drum is configured to mill the ground surface in an up-milling rotational direction while the machine is traveling

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forward. Accordingly, when the PM620 is traveling backwards and the milling drum is rotating, the milling drum's rotational direction corresponds to the traveling device's rotational direction. When traveling backwards, the PM620's milling drum can remain coupled to the drive engine (and rotating).

Id. at Q/A 482; *see also* CPX-0052C (PM312 driving backwards video). Accordingly, the administrative law judge has determined that the PM312 and PM620 include the functionalities recited in limitation 1[g].

- i) *1[h] a monitoring device monitors a distance between the milling drum and the ground surface*

Wirtgen argues, in part:

The PM620 and PM312 also include a monitoring device that “monitors a distance between the milling drum (12) and the ground surface (2)” as recited in element 1[h]. Specifically, the PM620 includes components having sensors and switches that indirectly monitor the distance between the milling drum and the ground surface by monitoring [

] . Hearing Tr. 728:2-4

(Engelmann) ([

]); Hearing Tr. 863:1-866:18 (Alleyne) ([

]).

This system monitors the []
prevent inadvertent contact with a surface, which again can be the
ground: “For this [automatic rotor disengagement] feature, the []
are monitored. The [

] .” CX-0591C.0360 (PM600
Technical Presentation); *see also* Hearing Tr. 728:5-733:4
(Engelmann) ([

]); *id.* at 861:2-22 (Alleyne) (confirming that the ‘641
patent includes indirectly monitoring the distance between the
milling drum and the ground, and that the side plates and moldboard
are sensing devices).

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Accordingly, the PM620's monitoring system includes the [

].

Wirtgen Br. at 146-47.⁴³

Caterpillar argues, in part:

Simply put, the PM300, PM600, and PM800 reverse-shutoff feature does not monitor a distance between the drum and the ground. *See* RX-0991C (Alleyne Rebuttal Witness Statement) at Q/A 107, 120, 199, 211. No such monitoring is involved—either direct or indirect—in Caterpillar's reverse-shutoff feature. *Id.* at Q/A 147-148, Q/A 238-239. In the Caterpillar machines, the reverse shutoff [], which proves that the distance between the drum and the ground is not used in the reverse-shutoff feature. *Id.*

Caterpillar Br. at 203.

Wirtgen replies, in part:

Caterpillar alleged that its reverse auto-shutoff feature does not monitor a distance between the milling drum and the ground surface because [], and not directly measuring the distance to the ground. This is a distinction without a difference. The '641 patent expressly describes that distance between the milling drum and the ground surface can be directly or indirectly monitored. JX-0004 ('641 patent) 5:7-8 ("The distance between the milling drum and the ground surface can be measured either directly or indirectly."). And for indirect monitoring, the '641 patent explains that this can be accomplished "by means of a path measuring device or by means of a limit switch that detects a certain position of the sensing device." JX.0004 5:18-23. This is precisely how Caterpillar monitors the distance. If [

], the rotor is automatically disengaged. Hearing Tr. 729:15-733:9 (Engelmann).

Wirtgen Br. at 51.

Caterpillar replies, in part:

⁴³ "ECM" is an acronym for "Electronic Control Module." *See* CX-0049 at 9. The PM312 []. *See id.* at 245 (showing engine, machine, and transmission ECMs).

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However, the PM300, PM600, and PM800 reverse travel shutoff feature does not monitor a distance between the milling drum and the ground surface, directly or indirectly. Tr. (Alleyne) at 917:17-918:4 (testifying that the accused products do not monitor the distance between the drum and the ground directly or indirectly). Although Caterpillar's accused products [

], not relative to the ground, and they are not used to indirectly determine the distance between the drum and the ground surface, as required by the claims. RX-0991C (Alleyne Rebuttal Witness Statement) at Q/A 96, 193.

Caterpillar Reply at 59.

(1) Section 112(6) Analysis of the PM620 and PM312

The administrative law judge previously determined that the “monitoring device” paragraph (*i.e.*, limitations 1[h] and 1[i]) is subject to § 112(6). To the extent structures or algorithms associated with the claimed functions could be discerned from the specification, the administrative law judge notes that Wirtgen has not shown that the Caterpillar machines perform the identical function recited in the claim and that the Caterpillar machines utilize identical or equivalent structure to the structure disclosed in the ‘641 Patent. *See MobileMedia Ideas LLC v. Apple Inc.*, 780 F.3d 1159, 1170 (Fed. Cir. 2015) (“Literal infringement of a § 112 ¶ 6 limitation requires that the relevant structure in the accused device perform the identical function recited in the claim and be identical or equivalent to the corresponding structure in the specification.”). Indeed, Wirtgen’s expert has not offered any infringement opinions with respect to § 112(6). *See* CX-0006C (Meyer WS) at Q/A 486-518. Accordingly, the administrative law judge has determined that Wirtgen has not shown the PM620 or PM312 machines infringe claim 1 if the “monitoring device” paragraph is subject to § 112(6).

The following two subsections of this Initial Determination assume that the “monitoring device” paragraph is not functionally claimed, and therefore not subject to § 112(6).

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(2) Analysis of the PM620

Assuming the “monitoring device” paragraph is not functionally claimed, the evidence shows that the PM620 includes [

] See CX-0006C (Meyer WS) at Q/A 488, 501-02. The PM620 uses the [

] monitor the distance between the milling drum and the ground surface. *Id.* at Q/A 488-89. A Caterpillar Technical Presentation (dated August 2016) describes the PM620’s reverse travel shutoff feature as follows:

[

– *Figure omitted* –

]

[

– Figure omitted –

]

See CX-0591C at 1-2, 360-61.⁴⁴ To summarize, the PM620 [

] and generates an event/warning [

]. *Id.*; see also *id.* at 211-12 (describing operation of [

]). This happens when the PM620 is raised and travelling backwards.

CX-0006C (Meyer WS) at Q/A 489. This is sufficient to show that the PM620 includes a monitoring device that monitors a distance between the milling drum and the ground, as limitation 1[h] requires.

(3) Analysis of the PM312

Assuming the “monitoring device” paragraph is not functionally claimed, the evidence shows that the PM312 [] that constitute a monitoring device. See CX-0006C (Meyer WS) at Q/A 493. The PM312 uses [

⁴⁴ Page 2 of the presentation explains that the presentation is intended for “[]” CX-00591C at 2.

Under the “CONTENT” heading, the presentation states, “This presentation describes the operation of the hydraulic and electrical systems for the PM620 and PM622 Cold Planers.” *Id.*

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] monitor the distance between the milling drum and the ground surface. *Id.* A draft Technical Presentation (undated and not finalized) describes the PM312's reverse travel shutoff feature as follows:

[

– Figure omitted –

]

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See CX-0049C at 234-35.⁴⁵ To summarize, the PM312 [

] and generates an event/warning [

]. *Id.*; see also *id.* at 223-25

(describing operation of []). This

happens when the PM312 is raised and travelling backwards. CX-0006C (Meyer WS) at Q/A

494. This is sufficient to show that the PM312 includes a monitoring device that monitors a

distance between the milling drum and the ground, as limitation 1[h] requires.

- j) ***1[i] uncouples the raised milling drum from the drive engine and/or uncouples the traveling devices from the drive engine and/or raises the machine frame and/or generates an alarm signal when the monitoring device detects a deviation that falls below a pre-determined distance.***

Wirtgen argues that “the PM620’s [

]” and that the PM312 can

do the same. See Wirtgen Br. at 149-50.

Caterpillar argues that Wirtgen has not shown infringement because the Caterpillar machines do not operate based “on a ‘deviation’ that falls below a predetermined distance between the milling drum and the ground surface.” Caterpillar Br. at 215. Caterpillar also argues that Wirtgen has not shown infringement under Caterpillar’s construction because “Wirtgen has not identified any evidence showing that the Caterpillar machines trigger the automatic shutoff feature by using any sort of “deviation” involving a distance to the ground.” *Id.* at 216.

⁴⁵ The draft Technical Presentation appears analogous to the finalized Technical Presentation for the PM600 products. Compare CX-0049C at 1-3 with CX-00591C at 1-3 (the draft presentation appears to use the PM600 presentation as a template).

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Wirtgen replies that it “has shown that the deviation recited in the claims corresponds to the distance that the moldboard (or sideplates) raise when triggering the shutoff.” Wirtgen Br. at 55.

Caterpillar replies, in part:

... Wirtgen seems to recognize the importance of the drum exposure condition at least for the PM300 machines, conceding that the rotor shutoff occurs when “[

].” Wirtgen PostHBr. at 150.

Disengaging the drum based on [] is not the same as taking action based on detecting a “deviation” that falls below a predetermined distance between the drum and ground.

Caterpillar Reply at 66-67.

(1) Section 112(6) Analysis of the PM620 and PM312

The administrative law judge previously determined that the “monitoring device” paragraph (*i.e.*, limitations 1[h] and 1[i]) is subject to § 112(6). To the extent structures or algorithms associated with the claimed functions could be discerned from the specification, the administrative law judge notes that Wirtgen has not shown that the Caterpillar machines perform the identical function recited in the claim and that the Caterpillar machines utilize identical or equivalent structure to the structure disclosed in the ‘641 Patent. *See MobileMedia Ideas LLC v. Apple Inc.*, 780 F.3d 1159, 1170 (Fed. Cir. 2015) (“Literal infringement of a § 112 ¶ 6 limitation requires that the relevant structure in the accused device perform the identical function recited in the claim and be identical or equivalent to the corresponding structure in the specification.”). Indeed, Wirtgen’s expert has not offered any infringement opinions with respect to § 112(6). *See CX-0006C (Meyer WS) at Q/A 486-518.* Accordingly, the administrative law judge has

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determined that Wirtgen has not shown the PM620 or PM312 machines infringe claim 1 if the “monitoring device” paragraph is subject to § 112(6).

The following two subsections of this Initial Determination assume that the “monitoring device” paragraph is not functionally claimed, and therefore not subject to § 112(6).

(2) Analysis of the PM620

Assuming the “monitoring device” paragraph is not functionally claimed, the evidence shows that the PM620’s [

J. See CX-0006C (Meyer WS) at Q/A 501, 506; CX-0591C (PM600 Technical Presentation) at 1-2, 211-12, 360-61. This is sufficient to show that the PM620 includes a monitoring device that detects a difference and uncouples the milling drum from the drive engine, as limitation 1[i] requires.

Accordingly, if the “monitoring device” paragraph is not functionally claimed, the administrative law judge has determined that Wirtgen has shown, by a preponderance of the evidence, that the PM620 infringes claim 1.

(3) Analysis of the PM312

If the “monitoring device” paragraph is not functionally claimed, the evidence shows that the PM312’s [

J. See CX-0006C (Meyer WS) at Q/A 509; CX-0049C (PM312 Technical Presentation) at 232 (“[

]”), 234-35. This is sufficient to show that the PM312 includes a monitoring

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device that detects a difference and uncouples the milling drum from the drive engine, as limitation 1[i] requires.

Accordingly, if the “monitoring device” paragraph is not functionally claimed, the administrative law judge has determined that Wirtgen has shown, by a preponderance of the evidence, that the PM312 infringes claim 1.

2. Claim 7

Wirtgen divides claim 7 into two limitations for its infringement analysis, as follows:

7[a] 7. Construction machine (1) in accordance with claim 1, characterized in that at least one sensing device capable of being lowered relative to the raised milling drum (12) is arranged at the milling drum (12) in such a manner that the sensing device projects vis-a-vis the milling drum (12) towards the ground surface (2) by a pre-determined distance, and

7[b] in that the monitoring device (14), in the raised position of the milling drum (12) and the simultaneously lowered position of the sensing device, uncouples at least the milling drum (12) from the drum drive (10) when the monitoring device (14) detects a contact of the at least one sensing device with the ground surface (2) or that the at least one sensing device is raised by the ground surface (2).

See CDX-0002 (Meyer Demonstratives) at 160-63; CX-0006C (Meyer WS) at Q/A 518-32.

- a) ***7[a] 7. Construction machine in accordance with claim 1, characterized in that at least one sensing device capable of being lowered relative to the raised milling drum is arranged at the milling drum in such a manner that the sensing device projects vis-a-vis the milling drum towards the ground surface by a pre-determined distance, and***

Wirtgen argues:

The PM620 and PM312 further satisfy claim 7. Both machines include “at least one sensing device capable of being lowered relative to the raised milling drum (12) is arranged at the milling drum (12) in such a manner that the sensing device projects vis-à-vis the milling drum (12) towards the ground surface (2) by a pre-determined distance” as recited in element 7[a]. Each of the PM620’s moldboard and the side plates can be lowered relative to the milling drum and [

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].
Hearing Tr. 731:14-733:9 (Engelmann). The distance the moldboard and sideplates project toward the ground surface is []. CX-0006C Q519 (Meyer Opening WS); CX-0591C (PM600 Technical Presentation); CX-0068 (PM620 and PM622 Cold Planers Machine System); CX-0062C (PM620 Annotated Photos Presentation); CX-0071 (PE622, PM620, and PM622 Cold Planers Electronic System). The PM312 is similarly configured. CX-0006C Q521 (Meyer Opening WS); CX-0049C (PM312 Technical Presentation); Hearing Tr. 731:14-733:9 (Engelmann); Hearing Tr. 266:6-20 (Meyer).

Wirtgen Br. at 151.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 201-17 (the limitation is not contested); Caterpillar Reply at 58-69 (same).

The evidence shows that the PM312 and PM620's [

] *See*

CX-0006C (Meyer WS) at Q/A 518-19, 521; *see also* Engelmann Tr. at 731-733. Accordingly, the administrative law judge has determined that the PM312 and PM620 include sensing devices that are capable of being lowered relative to the milling drum and that the sensing devices project vis-a-vis the milling drum towards the ground surface by a pre-determined distance, as limitation 7[a] requires.

- b) ***7[b] in that the monitoring device, in the raised position of the milling drum and the simultaneously lowered position of the sensing device, uncouples at least the milling drum from the drum drive when the monitoring device detects a contact of the at least one sensing device with the ground surface or that the at least one sensing device is raised by the ground surface.***

Wirtgen argues that the PM620 and PM312 are capable of meeting this limitation. *See*

Wirtgen Br. at 151-53.

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Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 201-17 (the limitation is not contested); Caterpillar Reply at 58-69 (same).

The evidence shows that the PM312 and PM620's [

] Dr. Meyer opined:

Again, as explained above regarding the monitoring device features of claim 1, the PM620 uses [

] During my inspection of the PM620, I confirmed that the [

] During the inspection, the PM620 [

)]

while traveling in reverse with the milling drum engaged and rotating. As the machine traveled backwards, the ramp engaged and [

] After the [

], the rotating milling drum

was automatically disengaged. This inspection confirmed that the PM620 includes a "monitoring device [that] in the raised position of the milling drum (12) and the simultaneously lowered position of the sensing device, uncouples at least the milling drum (12) from the drum drive (10) when the monitoring device (14) detects . . . that the at least one sensing device is raised by the ground surface (2)," as recited in claim 7.

CX-0006C (Meyer WS) at Q/A 524; *see also id.* at Q/A 526-27 (opining the PM312 is substantially similar to the PM620 with respect to this limitation); RX-0991C (Alleyne RWS) at Q/A 154-55, 244-45 (Dr. Alleyne does not offer an opinion specific to dependent claims 7 and 17). Accordingly, the administrative law judge has determined that the PM312 and PM620's [

], which satisfied limitation 7[b] requires.

Thus, provided claim 1 is infringed, the administrative law judge has determined that the PM620 and PM312 infringe claim 7.

3. Claim 11

For its infringement analysis, Wirtgen divides claim 11 into seven limitations, as follows:

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11[a] 11. Method for working ground surfaces (2) with a construction machine (1)

11[b] that is automotive by means of traveling devices (8)

11[c] and in which a milling drum (12) supported in a machine frame (4) is driven by a drive engine (6),

11[d] where the milling drum (12) is moved into a raised position when it is not in milling mode,

11[e] characterized in that, the milling drum (12) remains coupled with the drive engine (6) when in raised position and with a direction of travel in which the rotating direction of the milling drum (12) corresponds to the rotating direction of the traveling devices (8),

11[f] in that a distance is monitored between the rotating, raised milling drum (12) and the ground surface (2) or an obstacle located in front of the milling (12) when seen in the direction of travel, and

11[g] in that the milling drum (12) is uncoupled from the drive engine (6), and/or the traveling devices (8) are uncoupled from the drive engine (6) and/or the machine frame (4) is raised and/or an alarm signal is generated when detecting that the deviation falls below a pre-determined distance between the milling drum (12) and the ground surface (2).

See CDX-0002 (Meyer Demonstratives) at 164-79; CX-0006C (Meyer WS) at Q/A 533-37.

Wirtgen's entire argument for claim 11 is two paragraphs:

The elements of claim 11 largely mirror the elements of claim 1, incorporating the preamble as a limitation and presenting other limitations in a different order. Nonetheless, the PM620 and PM312 infringe every limitation of claim 11 for the reasons discussed above for claim 1. CX-0006C Q533-37 (Meyer Opening WS) (tracking the various limitations of claim 11 onto claim 1). Caterpillar argues that Wirtgen America needs to show evidence of actual use in order to prove direct infringement, but there is substantial circumstantial evidence to suggest that third parties are using the claimed inventions as a result of Caterpillars encouragement and promotion. *Toshiba Corp. v. Imation Corp.*, 681 F.3d 1358, 1365 (Fed. Cir. 2012) ("We hold there is sufficient evidence [to] reasonably conclude[] that, sometime during the relevant period . . . more likely than not one person somewhere in the United States [performed the claimed method].") (quoting *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1318 (Fed. Cir. 2009)) (internal quotes omitted).

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The software [] is always running on every accused machine, and the kinds of events that trigger the device and cause the drum to be uncoupled occur in the ordinary course of machine operation. Hearing Tr. 862:11-866:18 (Alleyne) (agreeing that the monitoring device in all Accused Products []

Hearing Tr. 734:7-735:7 (Engelmann) ([]);
[]).

Wirtgen Br. at 153-54.

Caterpillar's entire argument is:

Claims 11 and 17 are method claims, which require a party to perform a "[m]ethod for working ground surfaces" with a "construction machine" having the features recited in the claims. Wirtgen has provided no evidence that Caterpillar or any other party has actually practiced the claimed method in the United States. Wirtgen relies on a three customers—[]

[]—that Caterpillar sold the Accused Products to as the basis for its indirect infringement allegations. Dr. Meyer admitted that he did not have any first-hand knowledge that those companies had ever used the machines, had ever driven them in reverse, or had ever used the machines in a way that triggered a rotor shutoff during reverse travel because the distance between the drum and the ground fell below a predetermined distance. Tr. (Meyer) at 259:17-264:10; *see also* Tr. (Alleyne) at 921:10-15 (confirming that he has seen no evidence that these three customers ever actually had a drum exposure event). Dr. Meyer did not speak to any of these customers, did not obtain any videos showing the machines operating in the way required by the asserted claims, and did not check any event logs to see if the reverse travel shutoff routine ever occurred. *Id.* Thus, Wirtgen has failed to prove direct or indirect infringement of these method claims.

Caterpillar Br. at 217.

Wirtgen replies that "there is substantial circumstantial evidence to suggest that Caterpillar's customers are operating Caterpillar's machines in the manner instructed and promoted by Caterpillar and, therefore, are direct infringers of the methods recited in claims 11

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and 17.” Wirtgen Reply at 56-57 (citing *Toshiba Corp. v. Imation Corp.*, 681 F.3d 1358, 1365 (Fed. Cir. 2012)).

Caterpillar replies that “While circumstantial evidence can be used to establish an underlying act of direct infringement, *see Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1317-19 (Fed. Cir. 2009), it does not absolve Wirtgen of its burden to prove infringement by a preponderance of evidence.” Caterpillar Reply at 67.

a) Use of the PM600 and PM300 Products

The evidence shows that it is more likely than not that one of Caterpillar’s customers in the United States has used the PM620 in a manner that infringes claims 11 and 17. As to use, Mr. Engelmann, the supervisor of Caterpillar’s Cold Planer Products, testified that Caterpillar’s that customers drive the PM600 series machines in reverse and they cannot disable the auto-shutoff feature:

Q Caterpillar customers who have purchased the PM600 machine have driven the machines in reverse at some point; correct?

A Yeah, that’s a fair conclusion, I guess.

Q Otherwise they would keep driving straight and never go back?

A Right.

Q It’s a normal part of road milling that you reverse backward at some point to cut a new track; correct?

A Yes. It’s common.

Q The automatic motor disengagement feature is not an optional feature on the machines; correct?

A It is not.

Q So if Caterpillar customers are driving the vehicle in reverse and the rotor is running, this feature will be enabled; correct?

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A Only if the drum becomes exposed through the conditions we've talked about.

Q I

A].

Q So customers don't have the option of removing that feature themselves?

A They do not.

Engelmann Tr. 734-735; *see also* RX-0988C (Engelmann WS) at Q/A 3 ("I am the supervisor for the Cold Planer New Product Introduction Team at Caterpillar Paving."). Mr. Engelmann's testimony, however, does not concern the PM300 products, and Wirtgen does not cite to any additional testimony showing that a customer in the United States used a PM300 machine. *See* Wirtgen Br. at 153-54 (citing Alleyne Tr. 862-866 and Engelmann Tr. 734-735).⁴⁶

Accordingly, the administrative law judge has determined that the testimony Wirtgen cites has shown that a Caterpillar customer has used a PM600 series product in the United States. *See* Engelmann Tr. 734-735. The evidence does not show that a Caterpillar customer has used a PM300 series product. *See generally id.*; Alleyne Tr. 862-866 (the testimony does not establish that a PM300 series product was used in the United States).

b) Analysis of Limitations 11[a]-11[g]

Wirtgen and its expert argue that the PM620 and PM312 infringe claim 11 for the same reasons that the machines infringes claim 1. *See* Wirtgen Br. at 153; CX-0006C (Meyer WS) at Q/A 533-36.

⁴⁶ Dr. Alleyne, Caterpillar's expert, testified about the PM600 and PM300 series products' capabilities, not their use in the United States. *See* Alleyne Tr. 862-866.

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Apart from contesting the “monitoring” and “deviation” aspects of claims 1 and 11, Caterpillar does not present an independent argument as to why the PM620 and PM312 do not practice the steps of claim 11 when a person operates either machine. *See generally* Caterpillar Br. at 217; Caterpillar Reply at 67-69 (same).

Assuming that the PM620 and PM312 are used in the United States, the evidence shows that the PM620 and PM312 practice limitations 11[a]-11[g] when they are driven in reverse. *See* CX-0006C (Meyer WS) at Q/A 533-36; *see also* RX-0991C (Alleyne RWS) at Q/A 156-57, 246-47 (apart from contesting the “monitoring” and “deviation” aspects of claims 1 and 11, Dr. Alleyne does not offer any independent opinion concerning method claim 11 and 17, assuming the machines are used). In particular, method claim 11 is not subject to § 112(6), and thus the infringement conclusions provided above with respect to claim 1 also apply to claim 11.

4. Claims 15 and 17

Claim 17 requires that the machine of claim 15 is “characterized in that a scraper blade (22) that is arranged behind the milling drum (12) when seen in the direction of travel is used as a sensing device.” JX-0004 at 8:64-67.

Wirtgen argues that the PM620 and PM312 infringe claims 15 and 17 when the milling drum is raised and the machines travel in reverse. Wirtgen Br. at 154.

Apart from contesting the “monitoring” and “deviation” aspects of claims 1 and 11, Caterpillar does not present an independent argument as to why the PM620 and PM312 do not practice the steps of claims 15 and 17 when a person operates either machine in reverse with the milling drum raised. *See generally* Caterpillar Br. at 217; Caterpillar Reply at 67-69 (same).

Assuming that the PM620 and PM312 are used in the United States, the evidence shows that the PM620 and PM312 practice the steps of claims 15 and 17 when the milling drum is

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raised and they are driven in reverse. *See* CX-0006C (Meyer WS) at Q/A 539-58; *see also* RX-0991C (Alleyne RWS) at Q/A 156-57, 246-47 (apart from contesting the “monitoring” and “deviation” aspects of claims 1 and 11, Dr. Alleyne does not offer any independent opinion concerning method claim 11 and 17, assuming the machines are used); *id.* at Q/A 154-55, 244-45 (Dr. Alleyne does not offer an opinion specific to dependent claims 7 and 17).

5. Analysis of the Induced Infringement Allegations

The Supreme Court has stated that “in an action for induced infringement, it is necessary for the plaintiff to show that the alleged inducer knew of the patent in question and knew the induced acts were infringing.” *Commil USA, LLC v. Cisco Sys., Inc.*, 135 S. Ct. 1920, 1925, 191 L. Ed. 2d 883 (2015) (citing *Global-Tech Appliances, Inc. v. SEB S. A.*, 563 U.S. 754, 131 S.Ct. 2060 (2011)).

Here, Wirtgen has not shown that Caterpillar knew of the ‘641 Patent and that Caterpillar knew that the actions it allegedly induced were infringing. *See* Wirtgen Br. at 141-43. The documentation (*e.g.*, manuals and technical presentations) and evidence⁴⁷ Wirtgen refers to does not show that Caterpillar knew of the ‘641 Patent or that its acts were infringing. Accordingly, the administrative law judge has determined that Wirtgen has not shown that Caterpillar induces its customers to infringe the asserted claims.

D. Domestic Industry (Technical Prong)

Wirtgen argues that its W150CFi, W210i, and W100Ri/W120Ri machines practice claims 1, 7, 11, and 17. Wirtgen Br. at 157-168. Wirtgen argues that the W210i machine is

⁴⁷ Wirtgen cites: “Hearing Tr. 266:16-267:17; Hearing Tr. 728:5-733:4 (Engelmann); JX-0028C at 64:16-66:17, 138:10-139:5, 139:7-140:6, 140:9-141:4, 141:7-17, 142:3-16 (Lindholm Dep. Tr.); JX-0030C at 175:3-177:4, 177:7-17, 178:3-17, 178:21-179:7, 275:12-20, 276:2-8, 276:16-280:7 (O’Donnell Dep. Tr.); CX-0979C (PM622 Parts Manual).” *See* Wirtgen Br. at 143.

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“representative of the W200i, W220, W220i, and W250i machines” and that “the W100Ri/W120Ri machines can be considered representative of the W50Ri, W60Ri, W100Fi, W120Fi, W100CFi, W120CFi, and W130CFi machines.” *Id.* at 157. The W150CFi machine has been stipulated as representative of the W150i and W150CFi machines. *Id.*

In general, Caterpillar argues that the Wirtgen machines lack working devices, do not monitor a distance between the milling drum and the ground, and do not detect a deviation. *See generally* Caterpillar Br. at 217-21.

1. Claim 1

a) *1[p] 1. Automotive construction machine for working ground surfaces*

Wirtgen argues that the “W210i, W150CFi, and W100Ri/W120Ri are all automotive construction machines for working ground surfaces as recited in the preamble of claim 1 of the ‘641 patent.” Wirtgen Br. at 158.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 217-21 (the limitation is not contested); Caterpillar Reply at 69-72 (same).

The evidence shows that the W210i, W150CFi, and W100Ri/W120Ri are automotive are automotive construction machines that work ground surfaces. *See* CX-0006C (Meyer WS) at Q/A 569. Accordingly, the administrative law judge has determined that the W210i, W150CFi, and W100Ri/W120Ri are automotive construction machines for working ground surfaces, as limitation 1[p] requires.

b) *1[a] with a machine frame*

Wirtgen argues that the W210i, W150CFi, and W100Ri/W120Ri each has a frame. *See* Wirtgen Br. at 158.

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Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 217-21 (the limitation is not contested); Caterpillar Reply at 69-72 (same).

The evidence shows that the W210i, W150CFi, and W100Ri/W120Ri are automotive construction machines that have machine frames. *See* CX-0006C (Meyer WS) at Q/A 569-70. Accordingly, the administrative law judge has determined that the W210i, W150CFi, and W100Ri/W120Ri are automotive construction machines that include machine frames, as limitation 1[a] requires.

c) *1[b] with a drive engine for driving traveling devices and for driving working devices*

For the W210i, Wirtgen argues:

The W210i drive engine is connected to a pump distributor drive that is connected to a clutch that engages the belt drive for the milling drum. The lower pulley is connected to the reduction gearbox that turns the milling drum. Thus, the drive engine drives the milling drum and the belt drive. Under Wirtgen America's proposed construction, both the milling drum and the drive train constitute "working devices." The diesel engine drives each of these working devices. CX-0006C Q573 (Meyer Opening WS).

The W210i drive engine also drives the pump distributor drive, which in turn drives the traveling devices, the fan, the conveyor, and hydraulic cylinders used to adjust at least the scraper blade, steering, lifting columns, and side plates. The side plates would fall within the scope of working devices under Caterpillar's proposed construction because the side plates run along the ground surface while milling, thereby working the ground surface. Accordingly, the diesel engine also drives movement of the side plates which would be working devices under Caterpillar's proposed construction. CX-0006C Q574 (Meyer Opening WS).

Wirtgen Br. at 158-59. Wirtgen makes similar arguments for the W150CFi and the W100Ri/W120Ri. *Id.* at 159

Caterpillar argues, in part:

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Under the proper construction of “working devices,” claim 1 and dependent claim 7 require two or more devices for working a ground surface. . . . the W210i, W150CFi, and W100Ri/W120Ri machines only have one working device—the milling drum. *See id.* at Q/A 271.

Caterpillar Br. at 217-18. Caterpillar argues that the Wirtgen machines’ side plates “are not working devices because they do not work a ground surface . . . running along the ground is not sufficient to make a component a ‘working device’ under the ‘641 patent.” *Id.* at 218.

Caterpillar also argues that the Wirtgen machines’ rotor drive components (*e.g.*, the drivetrain) are not working devices because they “do not even touch the ground surface.” *Id.*

The evidence shows that the W210i, W150CFi, and W100Ri/W120Ri are automotive construction machines have main engines. *See* CX-0006C (Meyer WS) at Q/A 573, 575-76. The main engines drive the machines’ wheels or caterpillars. *Id.* In the W210i, the engine is “connected to a pump distributor drive that is connected to a clutch that engages the belt drive for the milling drum. The lower pulley is connected to the reduction gearbox that turns the milling drum. Thus, the drive engine drives the milling drum and the belt drive.” *Id.* at Q/A 573. The W150CFi and W100Ri/W120Ri are similarly configured. *Id.* at 575-76. Accordingly, the administrative law judge has determined that the W210i, W150CFi, and W100Ri/W120Ri each has an engine for driving traveling and working devices, as limitation 1[b] requires.

d) 1[c] with a milling drum for milling the ground surfaces

Wirtgen argues that the W210i, W150CFi, and W100Ri/W120Ri each includes a milling drum that mills ground surfaces. *See* Wirtgen Br. at 160.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 217-21 (the limitation is not contested); Caterpillar Reply at 69-72 (same).

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The evidence shows that the W210i, W150CFi, and W100Ri/W120Ri are automotive construction machines that include milling drums for milling pavement. *See* CX-0006C (Meyer WS) at Q/A 581-84.⁴⁸

e) 1[d] which is capable of being raised and

Wirtgen argues that the W210i, W150CFi, and W100Ri/W120Ri each includes a milling drum that is capable of being raised. *See* Wirtgen Br. at 160.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 217-21 (the limitation is not contested); Caterpillar Reply at 69-72 (same).

The evidence shows that the W210i, W150CFi, and W100Ri/W120Ri each has a milling drum that can be raised. *See* CX-0006C (Meyer WS) at Q/A 581-84.⁴⁹

f) 1[e] is driven by and capable of being uncoupled from the drive engine

Wirtgen argues that the W210i, W150CFi, and W100Ri/W120Ri each has milling drums that “are capable of being driven by and uncoupled from the drive engine via the clutch.” Wirtgen Br. at 161.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 217-21 (the limitation is not contested); Caterpillar Reply at 69-72 (same).

The evidence shows that the milling drums in the W210i, W150CFi, and W100Ri/W120Ri are driven by main engines and capable of can be uncoupled from the main

⁴⁸ CX-0006C (Meyer WS) at Q/A 581 cites to CDX-0002C at 199, which indicates that limitation 1[c] is “a milling drum (12) for milling the ground surfaces (2), which is capable of being raised[.]” This differs from Dr. Meyer’s infringement analysis, where limitation 1[c] is just “a milling drum (12) for milling the ground surfaces (2)[.]” *See* CDX-0002C at 146.

⁴⁹ *See id.*

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engine. *See* CX-0006C (Meyer WS) at Q/A 589-90.⁵⁰

g) 1[f] where the milling drum is capable of being moved into a raised position when it is not in milling mode

Wirtgen's brief does not explicitly address this limitation or limitation 1[e]. *See* Wirtgen Br. at 206 (the brief discusses limitation 1[e] and skips to 1[f]). Dr. Meyer addresses "limitation 1[e]" at Q/A 592. *See* CX-0006C (Meyer WS) at Q/A 592.

Caterpillar does not dispute that the milling drums in the W210i, W150CFi, and W100Ri/W120Ri can be raised when they are not in milling mode. *See generally* Caterpillar Br. at 217-21 (the limitation is not contested); Caterpillar Reply at 69-72 (same).

The evidence shows that the milling drums in the W210i, W150CFi, and W100Ri/W120Ri can be raised when they are not in milling mode. *See* CX-0006C (Meyer WS) at Q/A 592.⁵¹

h) 1[g] characterized in that, the milling drum remains coupled with the drive engine when in raised position and with a direction of travel in which the rotating direction of the milling drum corresponds to the rotating direction of the traveling devices

For the W210i, W150CFi, and W100Ri/W120Ri, Wirtgen argues that the "milling drum on these machines can continue to rotate when the milling drum is raised and the machine is traveling in reverse. When doing so, the rotating direction of the milling drum corresponds to the rotation direction of the tracks." Wirtgen Br. at 161.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 217-21 (the limitation is not contested); Caterpillar Reply at 69-72 (same).

⁵⁰ CX-0006C (Meyer WS) at Q/A 589 indicates this is limitation 1[d].

⁵¹ CDX-0002 at 203 indicates that limitation 1[e] is "the milling drum (12) is capable of being moved into a raised position when it is not in milling mode[.]"

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The evidence shows that the milling drums are coupled with the main engine when raised and that the milling drum and caterpillars rotate in the same direction when the machine travels in reverse. *See* CX-0006C (Meyer WS) at Q/A 593-94.⁵²

- i) ***1[h] a monitoring device monitors a distance between the milling drum and the ground surface***

Wirtgen argues:

The W210i, W150CFi, and W100Ri/W120Ri machines “monitor[] a distance between the milling drum (12) and the ground surface (2)” as recited in element 1[g]. Each machine includes a device that indirectly monitors the distance between the milling drum and the ground surface, for example, by monitoring the position of the scraper blade. The monitoring device determines the scraper position using from the position-sensing hydraulic cylinders of the scraper. Determining the position of the scraper is an indirect measurement of the distance between the milling drum and the ground. CX-0006C Q597-99 (Meyer Opening WS); CX-0201 (W210i Instruction Manual); CX-0001C (Pflaum WS).

Wirtgen Br. at 162. Wirtgen later argues that its machines include a controller that is part of the monitoring device. *Id.* at 163 (“the controller, the scraper, and scraper position sensing cylinders constitute a monitoring device that uncouples the milling drum from the drive engine when the ECM detects that a deviation falls below a predetermined distance, as recited in claim 1”); *see also* CX-0006C (Meyer WS) at Q/A 615.

Caterpillar argues that “Wirtgen has not shown that the W210i, W150CFi, and W100Ri/W120Ri machines monitor the distance between the milling drum and the ground surface as part of the reverse travel shutoff feature.” Caterpillar Br. at 218-19. Caterpillar argues that “Wirtgen has provided no evidence—through source code or any other document—showing how information detected by the scraper blade sensors is transformed into

⁵² CX-0006C (Meyer WS) at Q/A 593, 595 indicates this is limitation 1[f].

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information showing the distance between the drum and the ground.” *Id.* at 219. Caterpillar argues that Wirtgen’s source code review shows that Wirtgen’s machines rely on a binary status (*e.g.*, OK or NOT OK) of the scraper blade and a “Driving Lever Deflection” signal rather than a distance from the drum to the ground. *Id.* at 219-20.

Wirtgen replies that its machines indirectly monitor the distance between the milling drum and the ground:

Caterpillar completely misunderstands what indirect monitoring involves.

If a monitoring device took various measurements and then used those measurements to calculate the distance between the milling drum and the ground, then that would be direct monitoring. JX-0004 (‘641 patent) 2:58-60. Indirect monitoring is monitoring by proxy. *See id.* at 2:60-64. It involves using other known relationships between the parts of the machine and measuring changes in the positions of those parts as a proxy for determining the distance between the milling drum and the ground surface. *Id.* (“[I]ndirect measuring of the distance can be effected, for instance, via machine elements of the construction machine”). In other words, information about the actual distance between the ground surface and the milling drum need not be generated. That information is indirectly known because of the information generated by the scraper blade sensors. *See* JX-0004 (‘641 patent) 5:16-22 (“This sensor can measure the distance to the ground surface either directly or indirectly. . . . in case of indirect measuring, where the said monitoring is effected, for instance, by means of a path measuring device . . . that detects a certain position of the sensing device.”).

Wirtgen Reply at 59.

Caterpillar replies that Wirtgen has not cited sufficient evidence, and it also attacks Wirtgen’s expert’s reliance on Mr. Pflaum, who reviewed Wirtgen’s source code. Caterpillar Reply at 70.

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(1) Section 112(6) Analysis of the W210i, W150CFi, and W100Ri/W120Ri

The administrative law judge previously determined that the “monitoring device” paragraph (*i.e.*, limitations 1[h] and 1[i]) is subject to § 112(6)). To the extent structures or algorithms associated with the claimed functions could be discerned from the specification, the administrative law judge notes that Wirtgen has not shown that the Wirtgen machines perform the identical function recited in the claim and that the Wirtgen machines utilize identical or equivalent structure to the structure disclosed in the ‘641 Patent. *See MobileMedia Ideas LLC v. Apple Inc.*, 780 F.3d 1159, 1170 (Fed. Cir. 2015) (“Literal infringement of a § 112 ¶ 6 limitation requires that the relevant structure in the accused device perform the identical function recited in the claim and be identical or equivalent to the corresponding structure in the specification.”). Indeed, Wirtgen’s expert has not offered any domestic-industry opinions with respect to § 112(6). *See CX-0006C* (Meyer WS) at Q/A 596-617. Accordingly, the administrative law judge has determined that Wirtgen has not shown the W210i, W150CFi, and W100Ri/W120Ri machines practice claim 1 if the “monitoring device” paragraph is subject to § 112(6).

The following two subsections of this Initial Determination assume that the “monitoring device” paragraph is not functionally claimed, and therefore not subject to § 112(6).

(2) Analysis of the W210i, W150CFi, and W100Ri/W120Ri

Assuming the “monitoring device” paragraph is not functionally claimed, the evidence shows that the W210i’s controller, scraper, and scraper position sensing cylinders constitute a monitoring device. *See CX-0006C* (Meyer WS) at Q/A 597, 608. The W210i uses the controller, scraper, and scraper position sensing cylinders to indirectly monitor the distance between the milling drum and the ground surface. *Id.*; *see also CPX-0091C*. The W150CFi and

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W100Ri/W120Ri are configured and operate similarly. *See* CX-0006C (Meyer WS) at Q/A 598-99.

(3) Source Code

As noted above, Caterpillar has critiqued Wirtgen's reliance on source code and Mr. Pflaum, who reviewed Wirtgen's source code. *See* Caterpillar Br. at 219-20.

Wirtgen's Post-Hearing Brief and Reply generally avoid source code or citing to Mr. Pflaum's witness statement. For example, Wirtgen's Brief generically cites, in a string citation, to "CX-0001C (Pflaum WS)" without explaining why the witness statement is cited or how it demonstrates that Wirtgen practices claim 1. *See* Wirtgen Br. at 164. This is insufficient to support a conclusion that the Wirtgen machines practice any of the asserted claims. Dr. Meyer's generic citation to Mr. Pflaum's witness statement is similarly unhelpful because it does not cite the specific portions of Mr. Pflaum's witness statement that are pertinent to Wirtgen's burden. *See* CX-0006C (Meyer WS) at Q/A 596-617. Dr. Meyer's generic references to source code are similarly deficient because Dr. Meyer does not cite any exhibits in relation to limitations 1[h] and 1[i]. *Id.* Accordingly, the administrative law judge has not afforded Mr. Pflaum's analysis much weight.

- j) ***1[i] uncouples the raised milling drum from the drive engine and/or uncouples the traveling devices from the drive engine and/or raises the machine frame and/or generates an alarm signal when the monitoring device detects a deviation that falls below a pre-determined distance.***

Wirtgen argues:

The W210i, W150CFi, and W100Ri/W120Ri machines include a monitoring device that "uncouples the raised milling drum (12) from the drive engine (6) and/or uncouples the traveling devices (8) from the drive engine (6) and/or raises the machine frame (4) and/or generates an alarm signal when the monitoring device (14) detects a deviation that falls below a pre-determined distance" as recited in

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element 1[h]. Although the parties dispute the proper construction of “the monitored distance,” the DI machines practice this limitation under either party’s construction. CX-0006C Q605 (Meyer Opening WS); CX-0010C (Allen WS) Q90.

When the W210i is traveling in reverse and the milling drum is rotating, the clutch will be disengaged (*i.e.*, uncoupling the milling drum from the diesel engine) when the moldboard is raised above a pre-defined threshold. Before traveling in reverse, the W210i is raised to avoid obstacles. When raised, the moldboard is fully lowered. At this fully lowered moldboard position, the bottom of the moldboard extends below the bottom of the milling drum by a certain distance. This distance is determined by the machine design (*e.g.*, movement of the lower portion of the scraper and the extension of the scraper position-sensing cylinders). CX-0006C Q606 (Meyer Opening WS). The moldboard can be raised from the fully lowered position a certain amount before the moldboard reaches a threshold, thereby disengaging the clutch and stopping drum rotation. CX-0006C Q607 (Meyer Opening WS); CX-0001C (Pflaum WS); CX-0010C (Allen WS) Q90; CX-0193 (W100Ri, 120Ri Instruction Manual); CPX-0067C (W210i driving backwards video); CPX-0068C (W210i driving backwards video - 2); CX-0197 (W150CFi Instruction Manual); CPX-0108C (W120Ri driving backwards – rotor stopping - 1); CPX-0109C (W120Ri driving backwards – rotor stopping - 2); CPX-0110C (W120Ri driving backwards – rotor stopping - 3); CPX-0111C (W120Ri driving backwards – rotor stopping (front view)); CPX-0112C (W120Ri driving backwards – rotor stopping (front view) - 2).

[

J. Thus, the controller, the scraper, and scraper position sensing cylinders constitute a monitoring device that uncouples the milling drum from the drive engine when the ECM detects that a deviation falls below a predetermined distance, as recited in claim 1. CX-0006C Q608 (Meyer Opening WS); CX-0001C (Pflaum WS); CX-0193 (W100Ri, 120Ri Instruction Manual); CPX-0067C (W210i driving backwards video); CPX-0068C (W210i driving backwards video - 2); CX-0197 (W150CFi Instruction Manual); CPX-0108C (W120Ri driving backwards – rotor stopping - 1); CPX-0109C (W120Ri

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driving backwards – rotor stopping - 2); CPX-0110C (W120Ri driving backwards – rotor stopping - 3); CPX-0111C (W120Ri driving backwards – rotor stopping (front view)); CPX-0112C (W120Ri driving backwards – rotor stopping (front view) - 2).

Wirtgen Br. at 162-64.

Caterpillar's entire argument is:

Caterpillar's construction of "deviation" in claims 1 and 11 is "the difference between a variable and a set point." As described in Caterpillar's claim construction briefs, the determination of this difference must take into account the monitored distance between the drum and the ground surface. Caterpillar's Initial Claim Construction Brief at 51-55; Caterpillar's Reply Claim Construction Brief at 29. Under this construction of "deviation," Wirtgen has not identified any evidence showing that the alleged DI machines trigger the automatic shutoff feature by using any sort of "deviation" involving a distance to the ground.

Neither Dr. Meyer nor Mr. Pflaum addressed whether Wirtgen's alleged DI machines satisfy the "deviation" requirement under Caterpillar's construction. *See* CX-0006C (Meyer Opening WS) at Q/A 604-617, CX-0001C (Pflaum WS) at Q/A 39-51. Thus, Wirtgen has failed to provide any evidence that it satisfies the technical prong of the DI requirement for the '641 patent under Caterpillar's construction of "deviation."

Caterpillar Br. at 220-21. In reply, Caterpillar adds:

Under Wirtgen's construction, Wirtgen argues that its alleged DI machines practice this limitation based on an experiment it conducted during an inspection that showed "when the machine was moving backwards and was lowered onto the cinder block, the milling drum slowed to a stop." Wirtgen PostHBr. at 164. It is odd that Wirtgen relies on this "intentionally lowering onto a cinder block" experiment to support its domestic industry argument because it attacked a very similar "intentionally lowering" experiment Caterpillar used to establish that PM-565 anticipated these claims. *See id.* at 178 ("In that demonstration, however, Caterpillar intentionally lowered the milling machine out of a raised position in order to cause the kickback ski to contact the ground. . . . But an operator in a real-life setting would not lower the machine while traveling in reverse such that the kickback ski would contact the ground surface"). If intentionally lowering the machine onto a cinder block is not too farfetched to demonstrate the functionality of

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Wirtgen's DI machines, then neither is Caterpillar's PM-565 demonstration.

Caterpillar Reply at 71-72.

(1) Section 112(6) Analysis of the W210i, W150CFi, and W100Ri/W120Ri

The administrative law judge previously determined that the “monitoring device” paragraph (*i.e.*, limitations 1[h] and 1[i]) is subject to § 112(6)). To the extent structures or algorithms associated with the claimed functions could be discerned from the specification, the administrative law judge notes that Wirtgen has not shown that the Wirtgen machines perform the identical function recited in the claim and that the Wirtgen machines utilize identical or equivalent structure to the structure disclosed in the ‘641 Patent. *See MobileMedia Ideas LLC v. Apple Inc.*, 780 F.3d 1159, 1170 (Fed. Cir. 2015) (“Literal infringement of a § 112 ¶ 6 limitation requires that the relevant structure in the accused device perform the identical function recited in the claim and be identical or equivalent to the corresponding structure in the specification.”). Indeed, Wirtgen’s expert has not offered any domestic-industry opinions with respect to § 112(6). *See* CX-0006C (Meyer WS) at Q/A 596-617. Accordingly, the administrative law judge has determined that Wirtgen has not shown the W210i, W150CFi, and W100Ri/W120Ri machines practice claim 1 if the “monitoring device” paragraph is subject to § 112(6).

The following two subsections of this Initial Determination assume that the “monitoring device” paragraph is not functionally claimed, and therefore not subject to § 112(6).

(2) Analysis of the W210i, W150CFi, and W100Ri/W120Ri

Assuming the “monitoring device” paragraph is not functionally claimed, the evidence shows that the W210i includes a controller that uncouples the milling drum when the monitoring device detects a sufficient electrical change or difference in a signal produced by the scraper

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position sensing cylinders. *See* CX-0006C (Meyer WS) at Q/A 606-08 (the amperage in the output signal changes). In addition, Dr. Meyer observed the W210i uncouple the milling drum when the moldboard reached a predetermined threshold. *Id.* at 607. The W150CFi and W100Ri/W120Ri are configured and operate similarly. *See* CX-0006C (Meyer WS) at Q/A 609.⁵³

Accordingly, if the “monitoring device” paragraph is not functionally claimed, the administrative law judge has determined that Wirtgen has shown, by a preponderance of the evidence, that the W210i, W150CFi, and W100Ri/W120Ri practice claim 1.

(3) Source Code

The administrative law judge notes that as with limitation 1[h], Mr. Pflaum’s analysis has not been afforded much weight.

2. Claims 7, 11, 15, and 17

Wirtgen argues that the W210i, W150CFi, and W100Ri/W120Ri practice claims 7, 11, 15, and 17. *See* Wirtgen Br. at 164-68.

Apart from contesting the “working devices,” “monitoring” and “deviation” aspects of claim 1, Caterpillar does not present an independent argument as to why the W210i, W150CFi, and W100Ri/W120Ri do not practice claims 7, 11, 15, and 17. *See generally* Caterpillar Br. at 217-21; Caterpillar Reply at 69-72.

Accordingly, the administrative law judge has determined that if the W210i, W150CFi, and W100Ri/W120Ri practice claim 1, the machines also practice claim 7. Further, if the

⁵³ Caterpillar does not extensively rely on its expert to rebut Wirtgen’s evidence. *See, e.g.*, Caterpillar Br. at 218-19 (citing RX-0991C (Alleyne RWS) at Q/A 282-82); Caterpillar Reply at 70 (citing RX-0991C (Alleyne RWS) at Q/A 296).

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machines practice claim 1, then it is more likely than not that Wirtgen's customers practice claims 11, 15, and 17.

E. Anticipation – PM-565

1. Whether the PM-565 Is Prior Art

Caterpillar argues that “Before the effective filing date of the ‘641 patent, the PM-565 machine was sold in the United States with features that anticipate or render obvious claims 1, 7, 11, and 17 of the ‘641 patent. The PM-565 machine qualifies as prior art[.]” Caterpillar Br. at 155. Caterpillar also relies on manuals for the PM-565—specifically, RX-0001 (PM-565 OMM), RX-0002 (PM-565 Parts), and RX-1122 (CAT Technical Presentation)⁵⁴—to show specific features of the machine. *See* Caterpillar Reply at 44.

Wirtgen argues that there “is no evidence in the record as to when those purchases occurred, or whether the version of the manual cited was the version that was actually distributed to a customer, or whether the manual actually corresponded to the machine.” Wirtgen Br. at 169. Wirtgen also argues that “Caterpillar has not sufficiently shown that these product manuals are printed publications, or that they were available to the public before the earliest respective filing dates of the ‘340 and ‘641 patents. These products manuals were not made sufficiently accessible to the public before these dates.” *Id.*

Caterpillar replies by citing to evidence of its sales and testimony showing the PM-565 manuals were distributed. Caterpillar Reply at 44-46.

⁵⁴ The RX-1122 (CAT Technical Presentation) exhibit that Caterpillar references, *see* Caterpillar Reply at 44, was not admitted into evidence. *See* Respondents' Public Admitted Exhibit List (EDIS Doc. ID No. 646984, File ID No. 1298240); *see also* Tr. 1-998.

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(1) The PM-565 Machine Is Prior Art Under § 102(b)

Having considered the parties' arguments, the administrative law judge has determined that Caterpillar has shown, through clear and convincing evidence, that the PM-565 machine is prior art under 35 U.S.C. § 102(b). For example, RX-0129C and RX-1158C are Caterpillar invoices that show PM-565s were sold in 1995, which predates the '641 Patent's May 22, 2006 priority date by several years. *See* RX-0987 (Rife WS) at Q/A 64-65 (discussing RX-0129C and RX-1158C); RX-0998C (Engelmann WS) at Q/A 50-51; RX-0129C; RX-1158C.⁵⁵ Further, Mr. Rife testified that the PM-565 manuals describe features that "were present in PM-565 machines sold during the 1990's." RX-0987 (Rife WS) at Q/A 66.⁵⁶ The PM-565 manuals, RX-0001 (PM-565 OMM) and RX-0002 (PM-565 Parts), which are dated 1995 and 1999, corroborate Caterpillar's arguments and evidence. *See Fujifilm Corp. v. Motorola Mobility LLC*, 182 F. Supp. 3d 1014, 1028-29 (N.D. Cal. 2016); *Lazare Kaplan Int'l, Inc. v. Photoscribe Techs., Inc.*, 628 F.3d 1359, 1374 (Fed. Cir. 2010).

(2) The PM-565 Manuals Are Not Prior Art Under § 102

The administrative law judge has also determined that Caterpillar has not shown, through clear and convincing evidence, that two of the PM-565 manuals—RX-0001 (PM-565 OMM) and RX-0002 (PM-565 Parts)—are publicly accessible "printed publications" under 35 U.S.C. § 102.

The Federal Circuit has explained that a "reference is publicly available if it was 'disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art exercising reasonable diligence, can locate it.'" *In re NTP*,

⁵⁵ RPX-0003C also shows sales of PM-565 machines, but the header on every sheet of the Excel contains an "ATTORNEY WORK PRODUCT" label.

⁵⁶ Wirtgen does not cite to any evidence to rebut Mr. Rife's testimony.

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Inc., 654 F.3d 1279, 1296 (Fed. Cir. 2011); *see also In re Hall*, 781 F.2d 897, 899 (Fed. Cir. 1986).

Here, the evidence shows that Caterpillar gave the manuals to customers who purchased a PM-565, which costs several hundred thousand dollars. RX-0987 (Rife WS) at Q/A 64-65 (discussing RX-0129C and RX-1158C); RX-0998C (Engelmann WS) at Q/A 50-51; RX-0129C (showing a “total” price of \$[] that was discounted to a “grand invoice total” of \$[]); *see also* CX-0513C at 1 (showing prices for various Wirtgen, Roadtec, and Caterpillar machines ranging from \$[] to \$[]). This testimony does not show that the manuals were sufficiently available to an interested member of the public. *See Virginia Innovation Scis., Inc. v. Samsung Elecs. Co.*, 983 F. Supp. 2d 713, 738 (E.D. Va. 2014) (“Availability only at the cost of a \$10,000 membership fee is likely to render the document effectively inaccessible to the general members of the interested public.”), *vacated on claim construction grounds*, 614 F. App’x 503 (Fed. Cir. 2015). In other words, the purchase price of the PM-565 is so high that an interested person exercising reasonable diligence would not be able to locate and access the manuals.

Caterpillar also cites to Mr. Rife’s testimony stating that customers could purchase the manuals. *See* RX-0987 (Rife WS) at Q/A 68 (discussing RX-0062C (Caterpillar Corporate Policy concerning documents) and RX-0085 (an undated printout of a website)). However, Mr. Rife does not explain how RX-0062C allows a member of the public to obtain one of the manuals. *See* RX-0987 (Rife WS) at Q/A 68. Indeed, one portion of RX-0062 states it is Caterpillar’s “Corporate Procedure” that “[

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J.” RX-0062 at 2.

Similarly, the “Caterpillar website” shown in RX-0085 is not dated, and thus does not show that the manuals were publicly available before the critical date. *See Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1350 (Fed. Cir. 2016) (“The record is devoid of any evidence that a query of a search engine ***before the critical date***, using any combination of search words, would have led to Ratsimor appearing in the search results.” (emphasis added)); *see also Navico Inc. v. Garmin Int’l, Inc.*, No. 2:16-cv-00190-JRG-RSP, 2017 WL 3750252, at *3 (E.D. Tex. July 28, 2017), report and recommendation adopted, No. 216CV00190JRGRSP, 2017 WL 3764213 (E.D. Tex. Aug. 29, 2017). Further, Caterpillar does not cite any sales receipts or equivalent records (for the manuals) that would support Mr. Rife’s testimony.⁵⁷

Accordingly, on these facts, the administrative law judge has determined that Caterpillar has not met its burden of showing that the PM-565 manuals (*i.e.*, RX-0001 (PM-565 OMM) and RX-0002 (PM-565 Parts)) are publicly accessible “printed publications” under 35 U.S.C. § 102 (a) or (b).

The RX-1122 (CAT Technical Presentation) exhibit that Caterpillar references, *see* Caterpillar Reply at 44, was not admitted into evidence. *See* Respondents’ Public Admitted Exhibit List (EDIS Doc. ID No. 646984, File ID No. 1298240); *see also* Tr. 1-998. Accordingly, the administrative law judge finds that Caterpillar failed to meet its burden of showing that the presentation is prior art.

⁵⁷ The cases Caterpillar cites, *In re Enhanced Sec. Research, LLC*, 739 F.3d 1347, 1354-1357 (Fed. Cir. 2014) (finding operating manual publicly available printed publication); *Orion IP, LLC v. Hyundai Motor Am.*, 605 F.3d 967, 974 (Fed. Cir. 2010) (finding electronic parts catalog publicly available printed publication), are not analogous to the present investigation.

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2. Claim 1

For its invalidity analysis, Wirtgen divides claim 1 into five elements, as follows:

[1.a] 1. Automotive construction machine (1) for working ground surfaces (2), with a machine frame (4),

[1.b] with a drive engine (6) for driving traveling devices (8) and for driving working devices, and

[1.c] with a milling drum (12) for milling the ground surfaces (2), which is capable of being raised and is driven by and capable of being uncoupled from the drive engine (6), where the milling drum (12) is capable of being moved into a raised position when it is not in milling mode,

[1.d] characterized in that, the milling drum (12) remains coupled with the drive engine (6) when in raised position and with a direction of travel in which the rotating direction of the milling drum (12) corresponds to the rotating direction of the traveling devices (8), and

[1.e] a monitoring device (14) monitors a distance between the milling drum (12) and the ground surface (2) and uncouples the raised milling drum (12) from the drive engine (6) and/or uncouples the traveling devices (8) from the drive engine (6) and/or raises the machine frame (4) and/or generates an alarm signal when the monitoring device (14) detects a deviation that falls below a pre-determined distance.

See Caterpillar Br. at 155-61. Each element is addressed below.

a) [1.a] 1. Automotive construction machine for working ground surfaces, with a machine frame

Caterpillar argues that the PM-565 is an automotive construction machine that works ground surfaces, which includes a frame. See Caterpillar Br. at 156.

Wirtgen does not clearly rebut this argument. See generally Wirtgen Br. at 176-94 (the limitation is not contested); Wirtgen Reply at 61-68 (same); see also CX-0007C (Meyer RWS) at Q/A 271 (Dr. Alleyne's opinion focuses on element [1.e]).

The evidence shows that the PM-565 is a road-milling machine that includes a frame. See RX-0985C (Alleyne WS) at Q/A 481-485; see also Meyer Tr. 242 (conceding that the PM-

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565 satisfies first four elements of the claim). Accordingly, the administrative law judge has determined that the PM-565 discloses this element of the claimed invention.

b) [1.b] with a drive engine for driving traveling devices and for driving working devices

Caterpillar argues that the PM-565 includes a 3408 DITA Caterpillar engine that drives four D-4 crawler tracks and the milling drum. *See* Caterpillar Br. at 156-57.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 176-94 (the limitation is not contested); Wirtgen Reply at 61-68 (same); *see also* CX-0007C (Meyer RWS) at Q/A 271 (Dr. Alleyne's opinion focuses on element [1.e]).

The evidence shows that the PM-565 includes a 3408 DITA Caterpillar engine—a drive engine—that drives four D-4 crawler tracks and the milling drum. *See* RX-0985C (Alleyne WS) at Q/A 487-93; *see also* Meyer Tr. 242 (conceding that the PM-565 satisfies first four elements of the claim). The components connected to the milling drum also constitute “working devices.” RX-0985C (Alleyne WS) at Q/A 496. Accordingly, the administrative law judge has determined that the PM-565 discloses this element of the claimed invention.

c) [1.c] with a milling drum for milling the ground surfaces, which is capable of being raised and is driven by and capable of being uncoupled from the drive engine, where the milling drum is capable of being moved into a raised position when it is not in milling mode

Caterpillar argues that the PM-565 includes a milling drum that can be raised, is driven by the engine, and can be uncoupled from the engine. *See* Caterpillar Br. at 157-59. Caterpillar also argues that the milling drum can be raised when the PM-565 is not milling. *Id.*

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 176-94 (the limitation is not contested); Wirtgen Reply at 61-68 (same); *see also* CX-0007C (Meyer RWS) at Q/A 271 (Dr. Alleyne's opinion focuses on element [1.e]).

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The evidence shows that the PM-565 includes a milling drum for milling ground surfaces. *See* RX-0985C (Alleyne WS) at Q/A 493 (“the rotor of PM-565 constitutes a working device”); *id.* at Q/A 500. The milling drum is driven by the engine. *Id.* Further, the milling drum is raised and lowered by adjusting leg height. *Id.* at Q/A 493, 500, 503 (“the milling drum can be raised and lowered, which happens when legs are raised and lowered because the drum is fixed to the machine frame”). The milling drum can also be uncoupled from the engine. *Id.* at Q/A 500 (“PM-565 includes a rotor clutch that couples or uncouples the engine of PM-565 from its rotor”). Finally, the PM-565’s milling drum can be raised when it is not in milling mode. *Id.* at Q/A 503. Accordingly, the administrative law judge has determined that the PM-565 discloses this element of the claimed invention. *See id.* at Q/A 497-504; *see also* Meyer Tr. 242 (conceding that the PM-565 satisfies first four elements of the claim).

- d) ***[1.d] characterized in that, the milling drum remains coupled with the drive engine when in raised position and with a direction of travel in which the rotating direction of the milling drum corresponds to the rotating direction of the traveling devices***

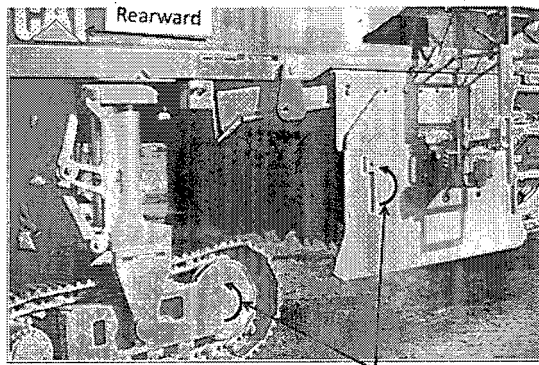
Caterpillar argues:

Wirtgen does not dispute that PM 565 discloses Element [1.d]. *See* Tr. (Meyer) at 242:14-22. As explained earlier, PM 565 includes a rotor equipped with cutting bits for milling a roadway surface, PM 565’s rotor is capable of being coupled or uncoupled to PM 565’s engine via a clutch, and PM 565’s rotor remains coupled with the engine when the rotor is in a raised position. RX-0985C (Alleyne Direct Witness Statement) at Q/A 507. The rotor of PM 565 continues to rotate while it is in a raised position, regardless of whether the machine travels in a forward or rearward direction, as long as engine speed is between 1,000 and 1,200 rpm, no kickback condition is detected, and the service door remains closed. *Id.* at Q/A 509.

A POSITA would recognize that when PM 565 travels in a rearward direction, the tracks of PM 565 would rotate in the same direction as the milling drum, which, when viewed from the right side of the

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machine, is the counter-clockwise direction, as shown below. *Id.* at Q/A 508.



Counter-clockwise rotation of rotor and track assemblies during rearward machine travel

RX-0003.0013, slide 10 (PM-565 STMG) (annotated). The PM-565 inspection videos show that when the PM-565 machine is travelling backwards, and while the drum is in the raised position, the tracks are rotating in the same direction as the drum, which is rotating because it is coupled to the drive engine. The videos at RPX-0028 at 5:04-8:30; RPX-0029 at 0:57-1:14; RPX-0030 at 0:41-1:07; RPX-0031 at 1:40-2:05; and RPX-0028 at 13:30-14:38 show the PM-565 tracks rotating in the same direction as the drum during reverse travel while the drum is raised.

Caterpillar Br. at 159-60.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 176-94 (the limitation is not contested); Wirtgen Reply at 61-68 (same); *see also* CX-0007C (Meyer RWS) at Q/A 271 (Dr. Alleyne's opinion focuses on element [1.e]).⁵⁸

The evidence shows that the PM-565's milling drum remains coupled with the drive engine when it is raised and the machine is driven in reverse. *See* RX-0985C (Alleyne WS) at Q/A 506-12; *see also* Meyer Tr. 242 (conceding that the PM-565 satisfies first four elements of

⁵⁸ Wirtgen argues that it "is not quite right" that element [1.d] is undisputed. *See* Wirtgen Reply at 61. Wirtgen's arguments concerning element [1.d] are considered in the context of limitation [1.e], as Wirtgen's Reply contemplates. *Id.*

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the claim). Accordingly, the administrative law judge has determined that the PM-565 discloses this element of the claimed invention.

- e) *[1.e] a monitoring device monitors a distance between the milling drum and the ground surface and uncouples the raised milling drum from the drive engine and/or uncouples the traveling devices from the drive engine and/or raises the machine frame and/or generates an alarm signal when the monitoring device detects a deviation that falls below a pre-determined distance.*

While Caterpillar does not explicitly identify the components that it contends constitute the monitoring device, Caterpillar's brief discusses the PM-565's kickback ski, a kickback ski sensor, a rotor service door position sensor, a three-position switch, a service door sensor, a proximity switch, and a CPC (*i.e.*, a Computerized Profiler Control). *See* Caterpillar Br. at 161-62 (citing RX-0985C (Alleyne WS) at Q/A 520, 526). Caterpillar argues, in part:

The kickback ski and proximity switch of the PM-565 are located just in front of the drum enclosure. RX-0598 (PM-565 Inspection-60) and RX-0596 (PM-565 Inspection-58); *see also* RX-0985C at Q/A 518. The PM-565 uses a proximity switch that detects a pivoting movement of the kickback ski in the clockwise or counter-clockwise direction. RX-0985C at Q/A 517. When the switch detects sufficient pivotal movement of the kickback ski from the sensor, it sends a signal to the CPC, which, in turn, causes the drum to stop moving by uncoupling it from the drive engine. *Id.* at Q/A 517.

For example, when the PM-565 is travelling in reverse with the drum rotating in a raised, non-milling state and the kickback ski hits an obstacle or the ground and pivots to trigger the switch, a signal is sent to the CPC, which results in uncoupling the drum from the drive engine, stopping the drum from rotating, and stopping the tracks. RX-0985C at Q/A 520, 526. Caterpillar's source code and Mr. Crockett's analysis of the source code confirms that this is how the kickback ski of the PM-565 is used to trigger the reverse travel automatic shutoff feature.

Caterpillar Br. at 162. Caterpillar's expert also relies on an inspection of the PM-565. *Id.* at 163; RX-0985C (Alleyne WS) at Q/A 518-19. Caterpillar continues:

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The '641 patent also does not clearly describe what component or components make up the sensor and what component or components make up the sensing device, which are two other terms used throughout the patent. The '641 patent explains the possibility of using different physical components of the machine as the sensing device, including the scraper blade, side plate, or tracer. . . . Claim 1 does not use the term sensing device and is silent as to what the sensing device is, where it is located, and how wide it is. . . . Thus, the kickback ski of the PM-565 is a sensing device under the '641 patent. . . . The PM-565 discloses a monitoring device that monitors distance to the ground surface by operation of the kickback ski, and uncouples the raised milling drum from the drive engine and stops the traveling devices when that kickback ski detects a deviation relative to the ground by hitting the ground (or an obstacle) and pivoting.

Caterpillar Br. at 164-65. Caterpillar argues that whether the sensing device precedes or follows the milling drum “is irrelevant to the claim 1 analysis.” *Id.* at 166. Caterpillar concludes that if one reads “the claim as written—not including the additional limitations Dr. Meyer seeks to add—claim 1 is anticipated by PM-565.” *Id.* at 167.

Wirtgen argues that claim 1 requires the operator to “raise the milling drum well-above the ground surface” and that Caterpillar’s inspection did not sufficiently raise the drum. Wirtgen Br. at 177. Wirtgen also argues that “All of the evidence Caterpillar pointed to for disclosure of the monitoring device relates to disengaging the milling drum (*i.e.*, rotor) after a kickback event is detected, which occurs *while milling and the drum is lowered*.” *Id.* at 178. Wirtgen stresses that “the kickback ski operates while the machine is *lowered, traveling forward, and milling*.” *Id.* Wirtgen also argues:

Caterpillar does not specifically allege that the PM465 or -565 detects a deviation that falls below a pre-determined distance, as recited in claim 1. Instead, Caterpillar erroneously analogizes the PM565 kickback ski to Wirtgen America’s domestic-industry machines, and concludes that if Wirtgen America’s machines practice this claim feature, so too does the PM565. But the Wirtgen America machines use a position sensing cylinder to monitor the vertical position of the scraper to determine when that scraper

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position falls below a predetermined distance defined by a threshold coded in the software. Monitoring the vertical scraper position relative to a predetermined threshold distance is substantially different than detecting pivoting motion with a proximity switch as in the PM565 kickback ski. A POSA would understand detecting the pivotal movement with a proximity switch does not involve “detect[ing] a deviation that falls below a pre-determined distance,” as recited in claim 1. CX-0007C (Meyer Rebuttal WS) Q293.

Id. at 179-80.

Caterpillar replies that Wirtgen did not address the term “raised position” during Markman and that it should not be allowed to revisit claim construction to propose a narrower construction of “substantially raised.” Caterpillar Reply at 49. Caterpillar also argues that its inspection (and videos) of the PM-565 shows that the PM-565 can operate in a manner such that the machine anticipates claim 1. *Id.* at 50-51.

(1) Section 112(6) Analysis of the PM565

The administrative law judge previously determined that the “monitoring device” paragraph (*i.e.*, element [1.e]) is subject to § 112(6)). To the extent structures or algorithms associated with the claimed functions could be discerned from the specification, the administrative law judge notes that Caterpillar has not shown that the PM-565 performs the identical function recited in the claim and that PM-565 utilizes identical or equivalent structure to the structure disclosed in the ‘641 Patent. *See Fresenius USA, Inc. v. Baxter Intern., Inc.*, 582 F.3d 1288, 1299 (Fed. Cir. 2009); *Transclean Corp. v. Bridgewood Servs., Inc.*, 290 F.3d 1364, 1372 (Fed. Cir. 2002) (“To anticipate a claim reciting a means-plus-function limitation, the anticipatory reference must disclose the recited function identically.”). Indeed, Caterpillar’s expert has not offered any anticipation opinions with respect to § 112(6). *See* RX-0985C (Alleyne WS) at Q/A 479-550. Accordingly, the administrative law judge has determined that

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Caterpillar has not shown the PM565 anticipates claim 1 if the “monitoring device” paragraph is subject to § 112(6).

The following subsection of this Initial Determination assumes that the “monitoring device” paragraph is not functionally claimed, and therefore not subject to § 112(6).

(2) Analysis of the PM-565

Assuming the “monitoring device” paragraph is not functionally claimed, the administrative law judge has determined that Caterpillar has not shown, through clear and convincing evidence, that the PM-565 includes a monitoring device that monitors a distance between the milling drum and the ground surface and uncouples the raised milling drum when the monitoring device detects a deviation that falls below a pre-determined distance. The PM-565’s kickback ski (along with the CPC) does not detect a change, difference, or departure in conditions when the machine is raised and travelling in reverse. *See* CX-0007 (Meyer WS) at Q/A 277-83. Indeed, the kickback ski detects a deviation when the PM-565 strikes a hard object when the machine is traveling forward or when the machine is plunged too quickly into a cut. *Id.* Accordingly, the administrative law judge has determined that the PM-565 does not anticipate claim 1.

3. Claim 7

Caterpillar divides claim 7 into a preamble and two elements for its invalidity analysis:

Construction machine (1) in accordance with claim 1, characterized in that

[7.a] at least one sensing device capable of being lowered relative to the raised milling drum (12) is arranged at the milling drum (12) in such a manner that the sensing device projects vis-a-vis the milling drum (12) towards the ground surface (2) by a pre-determined distance

[7.b] the monitoring device (14), in the raised position of the milling drum (12) and the simultaneously lowered position of the sensing

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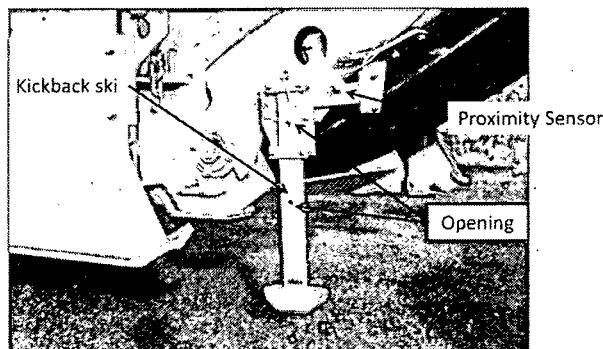
device, uncouples at least the milling drum (12) from the drum drive (10) when the monitoring device (14) detects a contact of the at least one sensing device with the ground surface (2) or that the at least one sensing device is raised by the ground surface (2).

See Caterpillar Br. at 170-72.

- a) ***[7.a] at least one sensing device capable of being lowered relative to the raised milling drum is arranged at the milling drum in such a manner that the sensing device projects vis-a-vis the milling drum towards the ground surface by a pre-determined distance***

Caterpillar argues that “claim 1 is anticipated by PM-565 or is obvious in view of PM-565 (alone or in view of PM-465).” Caterpillar Br. at 170. For element [7.a], Caterpillar argues:

As explained in connection with claim element [1.e] above, a POSITA would have known that they could have used the kickback ski of PM 565 to detect a kickback condition during reverse travel of PM 565. RX-0985C (Alleyne Direct Witness Statement) at Q/A 555. A POSITA would understand that the kickback ski would have to be positioned so that the kickback ski contacts the ground surface before the rotor, because otherwise the rotor would come into contact with the ground surface causing an uncontrollable displacement of PM 565 before the kickback ski can detect the kickback condition. *Id.* at Q/A 555. This positioning of the kickback ski is possible with the PM-565. *Id.* The kickback ski of the PM-565 (*i.e.*, the sensing device) projects vis-à-vis the milling drum towards the ground surface by a pre-determined distance. *Id.* In particular, the kickback ski points vertically towards the ground and can be fixed at various heights, including at heights below the milling drum as shown below:



SLIDE 91

RX-0003.0085, slide 91 (PM-565 STMG) (annotated). Mr. Rife confirmed that the PM-565 “kickback ski can hang below the

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drum.” Tr. (Rife) at 780:16-17. Thus, the PM-565 discloses lowering the kickback ski relative to the raised rotor of PM 565 so that the kickback ski projects relative to the rotor towards the ground surface by a pre-determined distance, as recited in claim 7, and Wirtgen does not appear to contend otherwise. RX-0985C at Q/A 551-555.

Caterpillar Br. at 170-71.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 176-94 (the limitation is not contested); Wirtgen Reply at 61-68 (same); *see also* CX-0007C (Meyer RWS) at Q/A 308 (Dr. Alleyne’s opinion focuses on element [7.b]).

This limitation is not heavily contested, and the evidence shows that the kickback ski can hang below the milling drum. *See* RX-0003.0085, slide 91 (PM-565 STMG). Accordingly, the administrative law judge has determined that the PM-565 discloses this element of claim 7.

- b) ***[7.b] the monitoring device, in the raised position of the milling drum and the simultaneously lowered position of the sensing device, uncouples at least the milling drum from the drum drive when the monitoring device detects a contact of the at least one sensing device with the ground surface or that the at least one sensing device is raised by the ground surface.***

Caterpillar argues:

As explained in connection with element [1.e] above, the kickback ski, switch, and CPC of PM-565 constitutes a monitoring device. RX-0985C (Alleyne Direct Witness Statement) at Q/A 558. And when the kickback ski of the PM-565 pivots upon contact with the ground surface, the proximity switch associated with the kickback ski detects that movement and generates a signal to be sent to the CPC, which decouples the rotor from the engine in response to the signal from the proximity switch. *Id.* Thus, the CPC and kickback ski of the PM-565 cold planer would uncouple the rotor from the engine upon detecting a contact of the kickback ski with the ground resulting in pivoting of the kickback ski. *Id.*

In rebuttal to this anticipation argument, Dr. Meyer makes similar arguments to the ones he made for claim 1, including in CX-0007C at Q/A 309-310 that “the kickback ski from the PM-565 was never designed to be used for travel in the reverse direction” and that “the

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kickback ski is completely inadequate as the kind of sensing device claimed in the '64 patent." These arguments should fail for the same reasons described above in claim 1.

For these reasons and the reasons explained for claim 1, the PM-565 alone and the PM-565 in combination with PM-465 renders claim 7 obvious. Dr. Meyer's rebuttal at CX-0007C at Q/A 313-314 likewise refers back to his arguments against the obviousness of claim 1, dismissing the PM-565 as "wholly inadequate" and "completely unsuited," despite the fact that, the PM-565 would be effective at triggering the automatic shutoff required by claims 1 and 7.

Caterpillar Br. at 171-72.

Wirtgen argues that "the PM565 does not uncouple the milling drum when the milling drum is 'in the raised position,' as recited in claim 7." Wirtgen Br. at 182.

Having considered the parties' arguments, the administrative law judge has determined that Caterpillar has not shown, through clear and convincing evidence, that (1) the kickback ski (in a lowered state), (2) the switch, and (3) the CPC uncouple the milling drum when the PM-565 is in a raised position and travelling backward. *See* CX-0007C (Meyer RWS) at Q/A 308-09 ("the PM-565 must be lowered out of the raised position for the kickback ski to contact the ground, thereby disengaging the milling drum"). Accordingly, the administrative law judge has determined that the PM-565 does not anticipate claim 7.

4. Claim 11

Caterpillar argues:

Claim 11 is directed to a "method for working ground surfaces." But the limitations of claim 11 are directed to the structure, arrangement, and operation of the recited machine in the same manner as the recitations for claim 1. RX-0985C (Alleyne Direct Witness Statement) at Q/A 561. The analysis of the structure, arrangement, and operation of PM 565 in connection with claim 1 applies equally to claim 11. These limitations are expressly disclosed for the same reasons discussed above and summarized in the table below. *See* RX-0985C at Q/A 560-591.

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Caterpillar Br. at 172. Caterpillar then critiques Dr. Meyer's rebuttal. *Id.* at 173-74.

Wirtgen argues that Caterpillar's arguments for claim 11 "fail for the same reasons that its argument for claim 1 fail." Wirtgen Br. at 183.

Caterpillar's entire reply is:

Wirtgen's primary rebuttal for Caterpillar's evidence showing that claim 11 is invalid is its "raised position" and "litigation-driven demonstration" arguments from claim 1, which it incorporates by reference. Wirtgen PostHBr. at 183-184. In addition, Wirtgen argues that Dr. Alleyne's suggestion that a POSITA would have known that, because the ski and drum are fixed to the machine, they could have used basic principles of geometry and modify the source code to determine the distance between the raised milling drum and the ground or an obstacle and arrive at this limitation defeats its anticipation argument. *Id.* at 183. However, Dr. Alleyne made this point in support of his obviousness analysis for claim 11, which Wirtgen does not rebut.

Caterpillar Reply at 52.

Wirtgen replies, in part:

Claim 11 recites a method of safely driving backwards in a milling machine employing a reverse-travel auto-shutoff feature. The steps of the method track largely onto claim 1, so both Wirtgen America's infringement analysis and Caterpillar's flawed arguments in response resemble those presented for claim 1. Caterpillar again wrongly argues that the intended use of the kickback ski does not matter. Cat. PH Br. at 172. If anything, it matters *even more* for claim 11, because claim 11 recites a method that was never performed prior to the critical date. There is no evidence that the kickback ski was ever actually arranged as suggested on page 174 of Caterpillar's brief—only that it "can be arranged" that way. Caterpillar presents no evidence the steps of claim 11 were ever performed, only that it could have been possible. Cat. PH Br. 174; *see also* CX-0007C (Meyer Rebuttal WS) Q329. The fact that the kickback ski was never intended, described, suggested, or understood to be used this way precludes any inference that the recited method was actually performed. Hearing Tr. 772:25-773:8 (Rife).

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Wirtgen Reply at 66.

The administrative law judge has determined that Caterpillar has not shown, through clear and convincing evidence, that the steps of claim 11 were practiced before the critical date. Indeed, Dr. Alleyne's opinions focus on the structure of the PM-565 rather than direct evidence showing that the PM-565 was used according to the steps recited in claim 11. For example, Dr. Alleyne states "It is my opinion that PM-565 discloses a method 'characterized in that, the milling drum (12) remains coupled with the drive engine (6) when in raised position and with a direction of travel in which the rotating direction of the milling drum (12) corresponds to the rotating direction of the traveling devices (8),' as recited in claim 11." RX-0985C (Alleyne WS) at Q/A 572. The PM-565 machine, by itself, does not disclose a method. Although Dr. Alleyne later refers to an operator using the machine, he does not cite any evidence that any operator performed the step recited in element [11.c] before the critical date. *See id.* at Q/A 573-74.

Similarly, Dr. Alleyne's testimony with respect to element [11.d] does not show that the PM-565 discloses the claimed step. Dr. Alleyne testified:

Q576. In your opinion, does PM-565 teach this limitation?

A: Yes. It is my opinion that, under any interpretation that would include the accused Caterpillar machines, PM-565, both alone, in view of the knowledge of a POSITA, and in combination with the PM-465 cold planer, discloses or suggests a method in which "a distance is monitored between the rotating, raised milling drum (12) and the ground surface (2) or an obstacle located in front of the milling (12) when seen in the direction of travel," as recited in claim 11.

RX-0985C (Alleyne WS) at Q/A 576. Dr. Alleyne's subsequent testimony that "a POSITA . . . could have used basic principles of geometry to modify the source code" in the PM-565 and that the kickback ski "could have [been] positioned . . . so that it would encounter the ground or an obstacle before the drum does" further shows that the PM-565 does not disclose element [11.d].

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Id. at Q/A 578-79. This testimony also assumes that an operator actually used the machine in the way Dr. Alleyne imagines. *See, e.g., id.* at Q/A 576-82. As with element [11.d], neither Caterpillar nor Dr. Alleyne has shown that any operator has used the PM-565, before the critical date, in a manner that shows element [11.e] was known. *Id.* at Q/A 583-91. Accordingly, Caterpillar has failed to show that claim 11 is anticipated.

5. Claim 15

Caterpillar argues:

As explained in connection with claim elements [1.d] and [1.e], PM-565 discloses that its rotor is capable of being raised so that it is out of contact with the ground surface during reverse travel of PM-565. A POSITA *would understand* that the PM-565 kickback ski *can be arranged* at a predetermined distance above the ground during reverse travel, and that this would have been one of two *options to try*. In particular, as shown and explained above, the ski can be arranged so that it touches the ground during reverse travel or so that it is above the ground at a predetermined distance. RX-0985C (Alleyne Direct Witness Statement) at Q/A 600-601. For example, a side-by-side comparison of RX-0003.0085, slide 91 and RX-0003.0120, slide 138 (PM-565 STMG) shown on the right illustrates that the kickback ski of PM-565 is capable of being attached to the machine frame at different heights.

When an operator raises the rotating milling drum of PM-565 above the ground and travels in reverse, with a kickback ski positioned to detect a kickback event, the PM-565 performs a method characterized in that the milling drum is raised by a pre-determined amount that is larger than a minimum distance between the milling drum and the ground surface, and in that a sensing device measuring towards the ground surface takes a lower limit position which corresponds to a pre-determined distance or to a minimum distance to be maintained between the milling drum and the ground surface, as recited in claim 15. *See* RX-0985C at Q/A 600-601.

Caterpillar Br. at 175-76 (emphasis added).

Wirtgen argues that Caterpillar has not shown that the PM-565 anticipates claim 15. *See*

Wirtgen Br. at 184-85.

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Caterpillar's entire response follows:

Wirtgen's primary rebuttal for Caterpillar's evidence showing that claim 15 is invalid is its "raised position," "intended use," and "wholly inadequate" arguments from claim 1. *Id.* at 184. These arguments should be rejected for the same reasons explained above.

Caterpillar Reply at 52.

The administrative law judge has determined that Caterpillar has failed to show that the PM-565 was used, before the critical date, in a manner that shows claim 15 was known. Dr. Alleyne's testimony opining that a person of ordinary skill would understand that "the ski can be arranged so that it touches the ground during reverse travel, or it can be positioned above the ground at a predetermined distance" does not show that the PM-565, if used before the critical date, would anticipate claim 15. *See* RX-0985C (Alleyne WS) at Q/A 600. Further, neither Caterpillar nor Dr. Alleyne has not shown that the PM-565 was used before the critical date. *See id.* at Q/A 601 (Dr. Alleyne assumes use of the PM-565). Accordingly, the administrative law judge has determined that Caterpillar has not shown the PM-565 anticipates claim 15.

F. Anticipation – PM-465

1. Whether the PM-465 Is Prior Art

Caterpillar argues that "Before the effective filing date of the '641 patent, the PM-465 machine was sold in the United States with features that anticipate or render obvious claims 1, 7, 11, and 17 of the '641 patent. The PM-465 machine qualifies as prior art and invalidates each of the asserted claims [.]” Caterpillar Br. at 178. Caterpillar also relies on manuals for the PM-465—specifically, the PM-465 Operation & Maintenance Manual (PM-465 OMM) (RX-0027) and the PM-465 Service Training Meeting Guide (PM-465 STMG) (RX-0028). *Id.* at 179. As with the PM-565 manuals, Caterpillar argues that the PM-465 manuals were distributed to customers when they purchased a machine and that the manuals were also available on the

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internet. *Id.* at 178-80. Caterpillar relies on the manuals themselves, which indicate the documents are from 1998 and 2003, the testimony of its employees, and its experts' testimony. *See id.* (citing RX-0028 (the front cover states "DECEMBER 1998"); RX-0027 (the front cover states "June 2003"); RX-0985C (Alleyne WS) at Q/A 620-22 (summarizing Caterpillar's employees' testimony and further citing to RX-0062C and RX-0085); RX-0988C (Engelmann WS) at Q/A 63 (testifying that the manuals were provided with the purchase of a machine and that the manuals were also available for purchase on the internet); RX-0987C (Rife WS) at Q/A 83 (same; also citing RX-0062C)).

Wirtgen addresses the PM-465 manuals in conjunction with the PM-565 manuals. *See* Wirtgen Br. at 168-70.

A heading in Caterpillar's Reply identifies the PM-465, but the body of Caterpillar's argument focuses solely on the PM-565. *See* Caterpillar Reply at 44-46.

(1) The PM-465 Machine Is Prior Art Under § 102(b)

The evidence shows that the PM-465 is prior art under 35 U.S.C. § 102(b). Specifically, RX-0221C (CMOPS Data-1) shows that a PM-465 with Serial Number [] was sold and shipped to []. *See* RX-0987C (Rife WS) at Q/A 81. The PM-465 manuals, RX-0027 (PM-465 OMM) and RX-0028 (PM-465 Technical Presentation), which are dated 1998 and 2003, which are dated 1995 and 1999, corroborate Caterpillar's arguments and evidence. *See Fujifilm Corp. v. Motorola Mobility LLC*, 182 F. Supp. 3d 1014, 1028-29 (N.D. Cal. 2016); *Lazare Kaplan Int'l, Inc. v. Photoscribe Techs., Inc.*, 628 F.3d 1359, 1374 (Fed. Cir. 2010).

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(2) The PM-465 Manuals Are Not Prior Art Under § 102

The administrative law judge's conclusions with regard to the PM-565 manuals (*e.g.*, that the manuals are not prior art because Caterpillar failed to show that the documents were on sale or publically available before the critical date), apply equally to the PM-465 manuals. In addition, RX-0085 is further deficient with respect to the PM-465 manuals because it does not show that the PM-465 manuals were available for purchase. *See* RX-0085 (no PM-465 document is returned in the results).

Accordingly, on the facts discussed above, the administrative law judge has determined that Caterpillar has not met its burden of showing that the PM-465 manuals (*i.e.*, RX-0027 (PM-465 OMM) and RX-0028 (PM-465 Technical Presentation)) are publicly accessible "printed publications" under 35 U.S.C. § 102 (a) or (b).

2. Claim 1

a) *[1.a] 1. Automotive construction machine for working ground surfaces, with a machine frame*

Caterpillar argues that the PM-465 is an automotive construction machine that works ground surfaces, which includes a frame. *See* Caterpillar Br. at 180-81.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 176-94 (the limitation is not contested); Wirtgen Reply at 61-68 (same); *see also* CX-0007C (Meyer RWS) at Q/A 346, 348, 351 (Dr. Alleyne's opinion focuses on elements [1.d] and [1.e]).

The evidence shows that the PM-465 is a road-milling machine that includes a frame. *See* RX-0985C (Alleyne WS) at Q/A 624-27. Accordingly, the administrative law judge has determined that the PM-465 discloses this element of the claimed invention.

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b) [1.b] with a drive engine for driving traveling devices and for driving working devices

Caterpillar argues that the PM-465 includes a 3406C Caterpillar engine that drives four crawler tracks and the milling drum. *See* Caterpillar Br. at 181.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 176-94 (the limitation is not contested); Wirtgen Reply at 61-68 (same); *see also* CX-0007C (Meyer RWS) at Q/A 346, 348, 351 (Dr. Alleyne's opinion focuses on elements [1.d] and [1.e]).

The evidence shows that the PM-465 includes a 3406C Caterpillar engine—a drive engine—that drives four crawler tracks and the milling drum. *See* RX-0985C (Alleyne WS) at Q/A 628-35. The components connected to the milling drum also constitute “working devices.” RX-0985C (Alleyne WS) at Q/A 633. Accordingly, the administrative law judge has determined that the PM-465 discloses this element of the claimed invention.

c) [1.c] with a milling drum for milling the ground surfaces, which is capable of being raised and is driven by and capable of being uncoupled from the drive engine, where the milling drum is capable of being moved into a raised position when it is not in milling mode

Caterpillar argues that the PM-465 includes a milling drum that can be raised, is driven by the engine, and can be uncoupled from the engine. *See* Caterpillar Br. at 182. Caterpillar also argues that the milling drum can be raised when the PM-465 is not milling. *Id.*

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 176-94 (the limitation is not contested); Wirtgen Reply at 61-68 (same); *see also* CX-0007C (Meyer RWS) at Q/A 346, 348, 351 (Dr. Alleyne's opinion focuses on elements [1.d] and [1.e]).

The evidence shows that the PM-465 includes a milling drum for milling ground surfaces. *See* RX-0985C (Alleyne WS) at Q/A 634 (“the rotor of PM-465 constitutes a working device”). The milling drum is driven by the engine. *Id.* at Q/A 633. Further, the milling drum is

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raised and lowered by adjusting leg height. *Id.* at Q/A 638 (“the elevation switches in each operator station control the machine height by raising and lowering the legs”). The milling drum can also be uncoupled from the engine. *Id.* at Q/A 639 (“the PM-465 cold planer includes a rotor clutch that couples or uncouples the engine of the PM-465 cold planer from its rotor.”). Finally, the PM-465’s milling drum can be raised when it is not in milling mode. *Id.* at Q/A 640-41. Accordingly, the administrative law judge has determined that the PM-465 discloses this element of the claimed invention. *See id.* at Q/A 636-42.

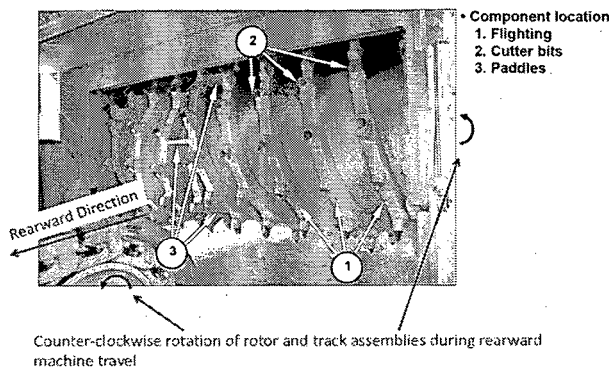
- d) ***[1.d] characterized in that, the milling drum remains coupled with the drive engine when in raised position and with a direction of travel in which the rotating direction of the milling drum corresponds to the rotating direction of the traveling devices***

Caterpillar argues:

Wirtgen disputes that PM-465 discloses Element [1.d]. As explained earlier for claim element [1.c], PM-465 includes a rotor equipped with cutting bits for milling a roadway, PM-465’s rotor is capable of being coupled or uncoupled to PM-465’s engine via a clutch, and PM-465’s rotor remains coupled with the engine when the rotor is in a raised position. RX-0985C at Q/A 645. The rotor of PM-465 continues to rotate while it is in a raised position, regardless of whether the machine travels in a forward or rearward direction, as long as engine speed is greater than 1100 rpm, the kickback ski is not activated, and the service door is not open. *Id.* at Q/A 647. Dr. Meyer contends that “Dr. Alleyne has failed to establish that the PM-465 has a milling drum that remains coupled with the drive engine when in raised position and traveling backwards.” CX-0007C (Meyer Rebuttal WS) at Q/A 347. This overlooks Dr. Alleyne’s testimony at RX-0985C at Q/A 645-648, which shows that PM-465 has a milling drum that remains coupled with the drive engine when in the raised position and traveling backwards.

A POSITA would recognize that when PM 465 travels in reverse, the track assemblies of PM 465 would rotate in the same direction as the milling drum, which, when viewed from the right side is the counter-clockwise direction, as shown below. RX-0985C at Q/A 646.

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RX-0028.0095, slide 66 (PM-465 STMG) (annotated). Thus, Element [1.d] is expressly disclosed by PM-465. RX-0985C at Q/A 643-649; RDX-0001.141-.144.

Caterpillar Br. at 193-84.

Wirtgen disputes this argument. *See generally* Wirtgen Br. at 187-88 (“Caterpillar cites no evidence showing that the milling drum remains coupled to the diesel engine when raised and traveling in reverse.”).

Caterpillar replies:

Wirtgen asserts that Caterpillar “cites no evidence showing that the milling drum remains coupled to the diesel engine when raised and traveling in reverse.” *Id.* at 187. But in the very next sentence, Wirtgen concedes that “Caterpillar cites to three portions of the PM465 manuals as disclosing this feature.” *Id.* Wirtgen next argues that a POSITA “cannot determine whether the disclosed PM465 machine’s kickback ski has even the functionality that Caterpillar asserts it has because the bottom of a kickback ski need only reach the same level as the bottom of a milling drum in order to function as a kickback ski.” *Id.* at 188. Wirtgen faults Caterpillar for not providing an inspection for the PM-465 and states that Caterpillar’s anticipation argument rests on “pure speculation.” *Id.* First, there is not inspection requirement to rely on a machine as prior art. As explained below for claim 7, the PM-465 OMM and PM-465 STMG, coupled with testimony, is more than enough to show that the PM-465 kickback ski extends below the drum.

Caterpillar Reply at 54.

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Having considered the parties arguments, the administrative law judge has determined that Caterpillar has not shown, through clear and convincing evidence, that the PM-465's milling drum remains coupled when the machine is raised and travelling in reverse. *See* CX-0007C (Meyer RWS) at Q/A 346-47. The testimony that Caterpillar cites—RX-0985C (Alleyne WS) at Q/A 645-648, including the exhibits discussed therein—does not show that the PM-465's milling drum is coupled when the machine is raised and travelling in reverse. Accordingly, the administrative law judge has determined that Caterpillar has failed to show that the PM-465 discloses this element of the claimed invention.

- e) ***[1.e] a monitoring device monitors a distance between the milling drum and the ground surface and uncouples the raised milling drum from the drive engine and/or uncouples the traveling devices from the drive engine and/or raises the machine frame and/or generates an alarm signal when the monitoring device detects a deviation that falls below a pre-determined distance.***

While Caterpillar does not explicitly identify the components that it contends constitute the monitoring device, Caterpillar's brief discusses the PM-465's kickback ski, the rotor (milling drum) door, a kickback ski switch (which is a proximity switch), an ECM, a CPC. *See* Caterpillar Br. at 184-87 (citing RX-0985C (Alleyne WS) at Q/A 650-68). Caterpillar notes that on the PM-465 the kickback ski is attached to the rotor door and argues, in part:

When the proximity switch detects sufficient pivoting movement of the kickback ski in the clockwise or counter-clockwise direction, it sends a signal to the ECM, which, in turn, causes the drum to stop by uncoupling it from the drive engine. RX-0985C at Q/A 653. When the PM-465 is travelling in reverse with the drum rotating in a raised, non-milling state and the kickback ski hits an obstacle or the ground and pivots to trigger the switch, a signal is sent to the CPC, which results in uncoupling the drum from the drive engine, stopping the drum from rotating, and stopping the tracks. RX-0985C at Q/A 654, 658. Caterpillar's source code and Mr. Crockett's analysis of the source code confirms that this is how the kickback ski of the PM-465 is used to trigger the reverse travel automatic shutoff feature. RX-0985C at Q/A 655-657. This was

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unrebutted by Mr. Pflaum, who, despite inspecting Caterpillar's prior art source code, did not offer an opinion on invalidity or Caterpillar's source code. Tr. (Pflaum) at 152:23-25 ("Q You also reviewed Caterpillar source code for the PM465 and 565 machines; correct? A Yes. . . . I don't have opinions about that code."); *id.* at 150:12-14 ("Q But you didn't offer an opinion on validity in this case either, did you? A No.").

Caterpillar Br. at 185-86. Caterpillar then critiques Dr. Meyer's opinions. *Id.* at 186-87.

Wirtgen's brief does not clearly identify which limitation it disputes, although it cites to CX-0007C (Meyer WS) at Q/A 350, which focuses on "a monitoring device (14) [that] monitors a distance between the milling drum (12) and the ground surface (2) and uncouples the raised milling drum (12)[.]" See Wirtgen Br. at 189. Wirtgen also contends that "Caterpillar fails to demonstrate that the PM465 shuts off the milling drum when the PM465 machine 'detects a deviation that falls below a pre-determined distance,' as recited in claim 1." *Id.* Wirtgen argues:

Additionally, Caterpillar fails to demonstrate that the PM465 shuts off the milling drum when the PM465 machine "detects a deviation that falls below a pre-determined distance," as recited in claim 1. Rather than provide any evidence linking the PM456 to the Asserted Claims, Caterpillar argues that if Wirtgen's safely driving backwards feature is covered by claim 1 of the '641 patent, then so too is the PM465 kickback ski. That comparison is erroneous. As discussed above in reference to the PM565 machine, the Wirtgen America machines use a position sensing cylinder to monitor the vertical position of the scraper to determine when that scraper position falls below a predetermined distance defined by a threshold coded in the software. CX-0193.0116 (W100Ri, 120Ri Instruction Manual). Monitoring the vertical scraper position relative to a predetermined threshold distance—as do the Wirtgen America machines—is substantially different than detecting pivotal motion with a proximity switch—as does the PM465. The conclusion that the Wirtgen America design is like the PM465 design is wrong. A POSA would understand detecting the pivotal movement with a proximity switch does not involve "detect[ing] a deviation that falls below a pre-determined distance," as recited in claim 1. CX-0007C (Meyer Rebuttal WS) Q352.

Id.

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Caterpillar's entire reply is:

Finally, Wirtgen argues that Element [1.e] is not anticipated by PM-465. *Id.* at 189. Wirtgen argues that its machines, which detect vertical movement of the scraper door, is "substantially different" than the PM-465, which detects pivoting movement of the kickback ski with a proximity switch. *Id.* However, this argument requires Wirtgen to read in an additional limitation (*i.e.*, that the required deviation be detected by a vertical displacement) that is found neither in the claim nor in either party's construction.

Caterpillar Reply at 54.

(1) Section 112(6) Analysis of the PM-465

The administrative law judge previously determined that the "monitoring device" paragraph (*i.e.*, element [1.e]) is subject to § 112(6). To the extent structures or algorithms associated with the claimed functions could be discerned from the specification, the administrative law judge notes that Caterpillar has not shown that the PM-465 performs the identical function recited in the claim and that PM-465 utilizes identical or equivalent structure to the structure disclosed in the '641 Patent. *See Fresenius USA, Inc. v. Baxter Intern., Inc.*, 582 F.3d 1288, 1299 (Fed. Cir. 2009); *Transclean Corp. v. Bridgewood Servs., Inc.*, 290 F.3d 1364, 1372 (Fed. Cir. 2002) ("To anticipate a claim reciting a means-plus-function limitation, the anticipatory reference must disclose the recited function identically."). Indeed, Caterpillar's expert has not offered any anticipation opinions with respect to § 112(6). *See* RX-0985C (Alleyne WS) at Q/A 616-68. Accordingly, the administrative law judge has determined that Caterpillar has not shown the PM-465 anticipates claim 1 if the "monitoring device" paragraph is subject to § 112(6).

The following subsection of this Initial Determination assumes that the "monitoring device" paragraph is not functionally claimed, and therefore not subject to § 112(6).

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(2) Analysis of the PM-465

Assuming the “monitoring device” paragraph is not functionally claimed, the administrative law judge has determined that Caterpillar has not shown, through clear and convincing evidence, that the PM-465 includes a monitoring device that monitors a distance between the milling drum and the ground surface and uncouples the raised milling drum when the monitoring device detects a deviation that falls below a pre-determined distance. The PM-465’s kickback ski (along with the CPC) does not detect a change, difference, or departure in conditions when the machine is raised and travelling in reverse. *See* CX-0007 (Meyer WS) at Q/A 349. Indeed, RX-0028 describes that the kickback ski “rides on the ground” when the PM-465 is “lowered into the cut and the machine is moving[.]” RX-0028 at 88. Accordingly, the administrative law judge has determined that the PM-465 does not anticipate claim 1.

3. Claim 7

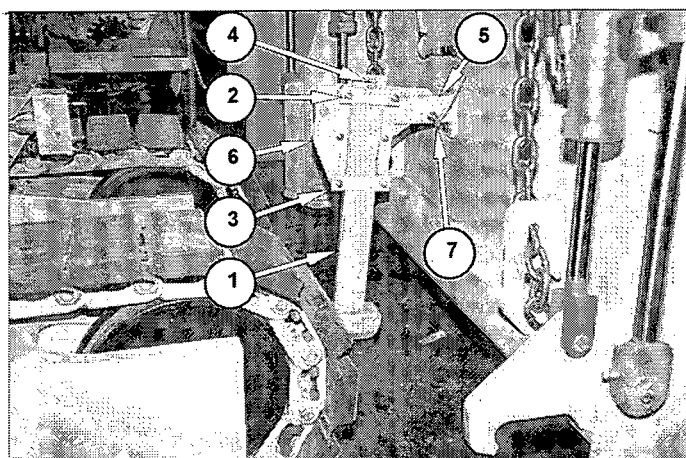
- a) ***[7.a] at least one sensing device capable of being lowered relative to the raised milling drum is arranged at the milling drum in such a manner that the sensing device projects vis-a-vis the milling drum towards the ground surface by a pre-determined distance***

Caterpillar argues:

As explained in connection with claim element [1.e] above, a POSITA would have known that they could have used the kickback ski of PM-465 to detect a kickback condition during reverse travel of PM-465. RX-0985C (Alleyne Direct Witness Statement) at Q/A 673. A POSITA would understand that the kickback ski would have to be positioned so that the kickback ski contacts the ground surface before the rotor, because otherwise the rotor would come into contact with the ground surface causing an uncontrollable displacement of PM-465 before the kickback ski can detect the kickback condition. RX-0985C at Q/A 673. This positioning of the kickback ski is possible with the PM-465. *Id.* The kickback ski of the PM-465 (*i.e.*, the sensing device) projects vis-à-vis the milling drum towards the ground surface by a pre-determined distance. *Id.* In particular, as described above and shown below, the kickback ski

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can be positioned below the drum, and in an approximate vertical position, which allows the ski to contact the ground before the drum:



• Rear side of rotor service door

• Component location

1. Kickback ski
2. Mounting straps
3. Mounting straps
4. Bolt
5. Mounting arm
6. Plate
7. Kickback ski switch

RX-0028.0088, slide 60 (PM-465 STMG). Thus, the PM-465 discloses lowering the kickback ski relative to the raised rotor of PM 465 so that the kickback ski projects relative to the rotor towards the ground surface by a pre-determined distance, as recited in claim 7. RX-0985C at Q/A 669-673. Wirtgen does not offer evidence to the contrary, and instead argues that because of the perspective view of the photograph above and the fact that the rotor is not visible in the picture, it is unclear whether the kickback ski projects below the milling drum. CX-0007C at Q/A 359. However, Dr. Alleyne testified that the kickback ski of the PM-465 does project below the milling drum. RX-0985C at Q/A 673. And Mr. Rife confirmed at trial that the PM-465 “kickback ski can hang below the drum.” Tr. (Rife) at 780:16-17. Dr. Meyer admits “that the only significant difference” between the PM-465 kickback ski in question and the PM-565, which does project below the milling drum, is the attachment point. CDX-0012C.109. Even if the PM-465 kickback ski did not project below the milling drum, it would have been obvious to a POSITA to modify the kickback ski of the PM-465 in this way.

Caterpillar Br. at 187-89.

Wirtgen argues that Caterpillar has failed to establish that the kickback ski can be lowered relative to the milling drum or that the kickback ski projects below the milling drum. See Wirtgen Br. at 190.

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Caterpillar's Reply cites to the same evidence presented in its Post-Hearing Brief. *See* Caterpillar Reply at 54-55.

Having considered the parties arguments, the administrative law judge has determined that Caterpillar has not shown, through clear and convincing evidence, that the PM-465 includes a sensing device that can be lowered relative to the milling drum, such that it projects toward the ground in comparison to the milling drum. To begin, the photo that Caterpillar relies upon, RX-0028.0088, does not show the milling drum. Dr. Alleyne's testimony finds that this element is met if the machine is modified:

Q673. What supports your opinion that PM-465 teaches this limitation?

A: As I explained earlier in connection with claim element [1.e], the kickback ski in the PM-465 can be used to detect a kickback condition during reverse travel of PM-465. As I also discussed in connection with claim element [1.e], a POSITA would understand that the kickback ski *would have to be* positioned so that the kickback ski contacts the ground before the rotor does, because otherwise the rotor would come into contact with the ground surface causing an uncontrollable displacement of PM-465 before the kickback ski can detect the kickback condition.

Referring to RDX-0001.147, where I have reproduced slide 60 in the PM-465 STMG, shows that positioning the ski below the drum *is possible*, and in an approximate vertical position, which allows the ski to contact the ground before the drum. Therefore, in my opinion, PM-465 discloses a kickback ski that is lower relative to the raised rotor of PM-465 so that the kickback ski projects relative to the rotor towards the ground surface by a pre-determined distance, as recited in claim 7.

RX-0985C (Alleyne WS) at Q/A 673 (emphasis added). Similarly, Mr. Rife's testimony simply shows that the kickback ski "can" hang below the drum:

Q And in both the PM465 and 565, can the kickback ski hang below the drum?

A The kickback ski can hang below the drum on both the 465 and the 565.

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Rife Tr. 780. The testimony does not show that the kickback ski was positioned below the drum before the critical date or that modifications would not be necessary to position the kickback ski below the drum. *See id.* Accordingly, the administrative law judge has determined that the PM-465 does not disclose this element of claim 7.

- b) ***[7.b] the monitoring device, in the raised position of the milling drum and the simultaneously lowered position of the sensing device, uncouples at least the milling drum from the drum drive when the monitoring device detects a contact of the at least one sensing device with the ground surface or that the at least one sensing device is raised by the ground surface.***

Caterpillar's entire argument is:

As explained for element [1.e], the kickback ski, switch, and/or ECM of PM-465 constitutes a monitoring device. RX-0985C (Alleyne Direct Witness Statement) at Q/A 676. When the kickback ski of the PM-465 pivots upon contact with the ground surface, the proximity switch associated with the kickback ski detects that movement and generates a signal to be sent to the ECM, which would decouple the rotor from the engine in response to the signal from the proximity switch. *Id.* Thus, the ECM and kickback ski of the PM-465 uncouples the rotor from the engine upon detecting a contact of the kickback ski with the ground resulting in pivoting of the kickback ski. *Id.* Thus, the PM-465 alone and in combination with the knowledge of a POSITA renders this limitation obvious, and Wirtgen does not appear to contend otherwise.

Caterpillar Br. at 189.

The administrative law judge has determined that the PM-465 does not disclose this element because Caterpillar has not shown that the kickback ski (*i.e.*, the sensing device) operates “in the raised position of the milling drum and the simultaneously lowered position of the sensing device[.]” In particular, Caterpillar has not shown that the PM-465's kickback ski lowers, as explained in relation to element [7.a]. Accordingly, the administrative law judge has determined that the PM-465 does not anticipate claim 7.

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4. Claim 11

Caterpillar argues:

Claim 11 is directed to a “method for working ground surfaces.” But the limitations of claim 11 are directed to the structure, arrangement, and operation of the recited machine in the same manner as the recitations for claim 1. RX-0985C (Alleyne Direct Witness Statement) at Q/A 679. Thus, the analysis of the structure, arrangement, and operation of PM 465 in connection with claim 1 applies equally to claim 11. These limitations are expressly disclosed for the same reasons discussed above and summarized below. *See* RX-0985C at Q/A 578-707.

Caterpillar Br. at 189. Caterpillar then critiques Dr. Meyer’s rebuttal. *Id.* at 190.

Wirtgen argues:

Independent claim 11 recites a method that corresponds to the apparatus of claim 1. Caterpillar relies on the same arguments for the “remains coupled” limitation in claim 11 that it did for claim 1. For the reasons discussed above, Caterpillar fails to show that the PM465 is capable of practicing this limitation. CX-0007C (Meyer Rebuttal WS) Q363.

Wirtgen Br. at 191.

Caterpillar’s entire reply is:

As explained above, the PM-465 discloses a kickback ski *attached to the scraper blade*. RX-0985C (Alleyne Direct Witness Statement) at Q/A 720. Therefore, the kickback ski design of PM-465 was already integrated into the scraper blade door to ensure that, if the kickback ski element contacted any obstacles or the ground before the rotor did during reverse travel of PM-465, the rotor would shut off. Wirtgen argues that that this would still be using a kickback ski, rather than the scraper blade, as the detection device. Wirtgen PostHBr. at 193. However, the kickback ski element as *integrated into or attached to* the rotor housing door would constitute the “sensing device” recited in claim 17. *See* RX-0985C at Q/A 720-721; Tr. (Rife) at 780:23-781:1 (“The kickback ski is bolted onto the back of the scraper blade. It becomes a one-unit . . . the upper door, lower door, scraper and the kickback ski, becomes one functional unit in the back.”); Tr. (Alleyne) at 856:15-23, 913:16-915:1 (“I believe scraper blades can have more than two parts.”); *see also* Tr. (Meyer) at 206:21-23 (“Q Okay. And is it

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possible for a scraper blade to have more than two movable parts? A I'm sure it is, yes."). Finally, Wirtgen argues that the scraper blade with integrated kickback ski could not sense anything or move upward when traveling in reverse. Wirtgen PostHBr. at 193. However, this argument requires Wirtgen to read in an additional limitation (*i.e.*, that the required deviation be detected by a *vertical* displacement) that is found neither in the claim nor in either party's construction.

Caterpillar Reply at 55-56.

Wirtgen replies, in part, that Caterpillar has not shown the method was "performed prior to the critical date." Wirtgen Reply at 66 ("Caterpillar presents no evidence the steps of claim 11 were ever performed, only that it could have been possible.").

The administrative law judge has determined that Caterpillar has not shown, through clear and convincing evidence, that the steps of claim 11 were practiced before the critical date. As with the PM-565, Dr. Alleyne's opinions about the PM-465 focus on the structure of the PM-465 rather than direct evidence showing that the PM-465 was used according to the steps recited in claim 11. For example, Dr. Alleyne states "It is my opinion that PM-465 discloses or suggests a method 'characterized in that, the milling drum (12) remains coupled with the drive engine (6) when in raised position and with a direction of travel in which the rotating direction of the milling drum (12) corresponds to the rotating direction of the traveling devices (8),' as recited in claim 11." RX-0985C (Alleyne WS) at Q/A 690. The PM-465 machine, by itself, does not disclose a method. Although Dr. Alleyne later refers to an operator using the machine, he does not cite any evidence that any operator performed the step recited in element [11.c] before the critical date. *See id.* at Q/A 690-92.

Similarly, Dr. Alleyne's testimony with respect to element [11.d] does not show that the PM-465 discloses the claimed step. Dr. Alleyne testified:

Q694. In your opinion, does PM-465 teach this limitation?

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A: Yes. It is my opinion that PM-465, both alone and in view of the knowledge of a POSITA, discloses or suggests a method in which “a distance is monitored between the rotating, raised milling drum (12) and the ground surface (2) or an obstacle located in front of the milling (12) when seen in the direction of travel,” as recited in claim 11.

RX-0985C (Alleyne WS) at Q/A 694. Dr. Alleyne’s subsequent testimony that “a POSITA would have known that, because the ski and drum are fixed to the machine, they could have used basic principles of geometry to modify the source code accordingly. This is because the ski and drum are fixed to the machine, which makes the design change one of simple geometry” further shows that the PM-465 does not disclose element [11.d]. *Id.* at Q/A 696. This testimony also assumes that an operator actually used the machine in the way Dr. Alleyne imagines. *See, e.g., id.* at Q/A 697. As with element [11.d], neither Caterpillar nor Dr. Alleyne has shown that any operator has used the PM-465, before the critical date, in a manner that shows element [11.e] was known. *Id.* at Q/A 699-707. Accordingly, Caterpillar has failed to show that claim 11 is anticipated.

5. Claim 15

Caterpillar argues:

As explained in connection with claim element [1.d] and [1.e] above, PM-465 discloses that its rotor is capable of being raised so that it is out of contact with the ground surface during a reverse travel of PM-465. *See also* RX-0985C (Alleyne Direct Witness Statement) at Q/A 715. A POSITA *would understand* that the PM-465 kickback ski *can be arranged* at a predetermined distance above the ground during reverse travel, and that this would have been one of two *options to try*. *Id.* at Q/A 716. In particular, the ski can be arranged so that it touches the ground during reverse travel or so that it is above the ground at a predetermined distance. *Id.*

Thus, when an operator raises the rotating milling drum of PM-465 above the ground surface and causes PM-465 to travel in reverse, with a kickback ski positioned to detect a kickback event, the PM-465 would perform a method characterized in that the milling

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drum is raised by a pre-determined amount that is larger than a minimum distance between the milling drum and the ground surface, and in that a sensing device measuring towards the ground surface takes a lower limit position which corresponds to a pre-determined distance or to a minimum distance to be maintained between the milling drum and the ground surface, as recited in claim 15. *See* RX-0985C at Q/A 716-717.

Caterpillar Br. at 191 (emphasis added).

Wirtgen argues that Caterpillar has not shown that the PM-465 anticipates claim 15. *See* Wirtgen Br. at 192.

Caterpillar's entire response follows:

Wirtgen's primary rebuttal for Caterpillar's evidence showing that claim 15 is invalid is its "intended use" and "wholly inadequate" arguments from claim 1. *Id.* at 192. These should be rejected for the reasons explained above and in Caterpillar's post-hearing brief.

Caterpillar Reply at 55.

The administrative law judge has determined that Caterpillar has failed to show that the PM-465 was used, before the critical date, in a manner that shows claim 15 was known. Dr. Alleyne's testimony opining that a person of ordinary skill would understand that "the kickback ski can be arranged at a predetermined distance above the ground during reverse travel, and that this would have been one of two options to try." does not show that the PM-465, if used before the critical date, would anticipate claim 15. *See* RX-0985C (Alleyne WS) at Q/A 716. Further, neither Caterpillar nor Dr. Alleyne has not shown that the PM-465 was used before the critical date. *See id.* at Q/A 717 (Dr. Alleyne assumes use of the PM-465). Accordingly, the administrative law judge has determined that Caterpillar has not shown the PM-465 anticipates claim 15.

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G. Obviousness – “PM-565 combined with the knowledge of a POSITA and/or PM-465”

Caterpillar argues that claims 1, 7, 11 and 17 would have been “obvious over PM-565 combined with the knowledge of a POSITA and/or PM-465.” Caterpillar Br. at 155.

Caterpillar’s obviousness arguments for claim 1, 7, and 11 are blended with its anticipation arguments. *See id.* at 155-176.

1. Claim 1⁵⁹

Caterpillar argues element [1.e] is “Expressly disclosed by PM-565; or obvious over PM-565 alone or in view of PM-465[.]” Caterpillar Br. at 160. For obviousness, Caterpillar argues:

As an alternative, this limitation of claim 1 is obvious in view of PM-565 alone (*i.e.*, in view of the knowledge of a POSITA) or when combined with PM-465. If a POSITA wanted to make the drum shutoff occur sooner during reverse travel, it would have been an easy and obvious design change to attach the kickback ski to the machine behind the drum. RX-0985C (Alleyne Direct Witness Statement) at Q/A 537-38. For example, a POSITA could attach the ski to the scraper blade or the side of the machine frame behind the drum. *Id.* This would cause the shutoff to simply happen sooner when the machine is traveling in the reverse direction. *Id.* It would have been obvious to a POSITA to make this design change considering PM-565 alone.

Caterpillar Br. at 167-68.

Wirtgen argues:

Nor is claim 1 obvious in light of the PM565 alone. Caterpillar also asserts that a POSA could modify the PM565 to place the kickback ski behind the milling drum instead of in front of and to the side of the drum. That argument completely ignores the function of the PM565 kickback ski. The PM565 kickback ski is designed to detect a sudden change in direction due to kickback caused by the milling drum encountering an extremely hard object while milling in the forward direction. A POSA would have understood that the PM565

⁵⁹ Caterpillar has not shown that claim 1 would have been obvious if the monitoring device paragraph (*i.e.*, element [1.e]) is subject to § 112(6) because it has not presented a means-plus-function analysis of this element.

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kickback ski was not designed to detect an object before it reaches the milling drum while the machine is traveling in reverse. CX-0007C (Meyer Rebuttal WS) Q297. Furthermore, a POSA would have no motivation to move the kickback ski, because there is no problem with the location of the kickback ski; the kickback ski worked fine to detect kickback in the front of the machine. Caterpillar's argument here requires that a POSA invent an entirely new use for the kickback ski. That is not the proper analysis nor is it true. CX-0007C (Meyer Rebuttal WS) Q298. The argument that it would have been obvious to move the PM565 kickback ski to the back of the drum housing without identifying any problem or solution related to kickback detection is pure hindsight reconstruction of the claimed invention. CX-0007C (Meyer Rebuttal WS) Q298.

Moreover, attaching the kickback ski to the scraper would negatively affect the intended operation of the PM565's scraper. As demonstrated during the inspection, the PM565 scraper pivots upward to provide access to the milling drum for servicing. A POSA would have recognized that mounting the kickback ski to the scraper as Caterpillar's invalidity analysis suggests would substantially restrict how high the scraper could be rotated upward, thereby significantly limiting the operating room for bit changes and drum inspection. CX-0007C (Meyer Rebuttal WS) Q299.

Wirtgen Br. at 180-81.

Caterpillar replies:

If a POSITA wanted to make the drum shutoff occur sooner during reverse travel, it would have been an easy and obvious design change to attach the kickback ski to the machine behind the drum. RX-0985C (Alleyne Direct Witness Statement) at Q/A 537-38. Wirtgen's primary rebuttal is that "a POSA would have no motivation to move the kickback ski, because there is no problem with the location of the kickback ski; the kickback ski worked fine to detect kickback in the front of the machine." Wirtgen PostHBr. at 180. There is no requirement that there be a problem with the prior art for a modification to be obvious to a POSITA. *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1002-03 (Fed. Cir. 2016) ("Google also argues that it does not need to show that there was a known problem with the prior art system in order to articulate the required rational underpinning for the proposed combination. We agree.").

Caterpillar Reply at 51.

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Having considered the parties' arguments, the administrative law judge has determined that Caterpillar has not shown, through clear and convincing evidence, that the proposed modification would have been obvious. To begin, Caterpillar has not explained why a person of ordinary skill in the art would want to modify the PM-565 in the manner that Dr. Alleyne suggests, specifically so that the drum shutoff would occur sooner. *See* CX-0007C (Meyer WS) at Q/A 295-98, 303; RX-0985C (Alleyne WS) at Q/A 537-38; *see also Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016) ("a patent can be obvious in light of a single prior art reference if it would have been obvious to modify that reference to arrive at the patented invention."). Further, Dr. Alleyne has not fully explained how moving the kickback ski would affect the ski's ability to detect kickback when the PM-565 is milling in the forward direction. *See* CX-0007C (Meyer WS) at Q/A 297-98 ("But again Dr. Alleyne ignores the function of the PM-565 kickback ski. The PM-565 kickback ski is designed to detect a sudden change in direction due to kickback caused by the milling drum encountering an extremely hard object while milling in the forward direction. A POSA would have understood that the PM-565 kickback ski was not designed to detect an object before it reaches the milling drum while the machine is traveling in reverse."). Accordingly, the administrative law judge has determined that element [1.e] would not have been obvious based on the PM-565 alone or "in combination with the knowledge of a POSITA."

2. Claim 7

Caterpillar's combined anticipation and obviousness arguments are presented above. *See* Part V(E), *infra*. Dr. Alleyne addresses claim 7 in a similarly combined manner at Q/A 552-59. *See, e.g.*, RX-0985C (Alleyne WS) at Q/A 552-59.

Wirtgen argues:

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Caterpillar also argues that the PM565 alone or in combination with the PM465 render claim 7 obvious, but does not provide any additional analysis for these alleged obviousness positions. CX-0007C (Meyer Rebuttal WS) Q313. Claim 7 would not have been obvious because the kickback ski is wholly inadequate for the use that Caterpillar proposes. A POSA would not have used the very narrow kickback ski in a system to ensure safe travel in reverse with the milling drum engaged. No matter where the kickback ski was positioned around the rotor, given the kickback ski's narrowness, it would have protected at most a few centimeters of the milling drum from inadvertent obstacle strikes. CX-0007C (Meyer Rebuttal WS) Q314.

Wirtgen Br. at 182.

Caterpillar's Reply does not explain whether it is addressing anticipation or obviousness.

See Caterpillar Reply at 51-52.

Caterpillar bears the burden of proving invalidity and has the responsibility of presenting a cogent argument. It has failed to do so. Dr. Alleyne's testimony on element [7.b] is three questions, the first two of which are introductory. The three questions follow:

Q556. What is the next additional limitation of claim 7?

A: The next limitation is [7.b] "the monitoring device (14), in the raised position of the milling drum (12) and the simultaneously lowered position of the sensing device, uncouples at least the milling drum (12) from the drum drive (10) when the monitoring device (14) detects a contact of the at least one sensing device with the ground surface (2) or that the at least one sensing device is raised by the ground surface (2)."

Q557. In your opinion, does PM-565 teach this limitation?

A: Yes. In my opinion, PM-565 also discloses "the monitoring device (14), in the raised position of the milling drum (12) and the simultaneously lowered position of the sensing device, uncouples at least the milling drum (12) from the drum drive (10) when the monitoring device (14) detects a contact of the at least one sensing device with the ground surface (2) or that the at least one sensing device is raised by the ground surface (2)," as recited in claim 7.

Q558. What supports your opinion that PM-565 teaches this limitation?

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A: As I explained in connection with element [1.e], the kickback ski, switch, and/or CPC of PM-565 would constitute a monitoring device. Further, as I discussed in connection with claim element [1.e], when the kickback ski of the PM-565 cold planer pivots upon contact with the ground surface, the proximity switch associated with the kickback ski detects that movement and generates a signal to be sent to the CPC. This is shown in RDX-0001.110, where I have reproduced slide 91 from page 85 of RX-0003. The CPC of the PM-565 cold planer would decouple the rotor from the engine in response to the signal from the proximity switch. Thus, the CPC and kickback ski of the PM-565 cold planer would uncouple the rotor from the engine upon detecting a contact of the kickback ski with the ground resulting in pivoting of the kickback ski.

RX-0985C (Alleyne WS) at Q/A 556-58.

As with anticipation, the administrative law judge has determined that Caterpillar has not shown, through clear and convincing evidence, that that (1) the kickback ski (in a lowered state), (2) the switch, and (3) the CPC uncouple the milling drum when the PM-565 is in a raised position and travelling backward. *See* CX-0007C (Meyer RWS) at Q/A 308-09. Caterpillar's arguments and Dr. Alleyne's testimony do not bridge this deficiency. Indeed, neither the argument nor the testimony fully addresses the differences between the PM-565 and claim 7 and how they are to be filled in. *See Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966) ("Under § 103, the scope and content of the prior art are to be determined [and the] differences between the prior art and the claims at issue are to be ascertained[.]"); *KSR*, 550 U.S. at 406-07 (quoting *Graham*). Accordingly, the administrative law judge has determined that claim 7 would not have been obvious based on the PM-565 alone or "in combination with the knowledge of a POSITA."

3. Claim 11

Caterpillar's obviousness arguments for claim 11 rely on the arguments it advanced for element [1.e]. *See* Caterpillar Br. at 172-73. Dr. Alleyne's testimony likewise refers to his

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previous opinions for claim 1. *See generally* RX-0985C (Alleyne WS) at Q/A 562-91 (Dr.

Alleyne refers to claim 1 at various points in his testimony). Portions of Dr. Alleyne's testimony pertain to obviousness, but Caterpillar has not cited them in its brief. *See* Caterpillar Br. at 172-74; RX-0985C (Alleyne WS) at Q/A 579-80, 587-90.

Wirtgen argues, in part:

Additionally, Caterpillar attempts argues that the PM565 could anticipate a "distance" that is "monitored between the rotating, raised milling drum (12) and the ground surface (2) or an obstacle located in front of the milling (12) when seen in the direction of travel," arguing that "a POSITA would have known that, because the ski and drum are fixed to the machine frame, they could have used basic principles of geometry to modify the source code accordingly." RX-0985C.0148 (Alleyne Direct WS). This position is internally inconsistent. Caterpillar is suggesting that the PM565 anticipates claim 11, while simultaneously recognizing that the source code of the PM565 would have to be modified. Caterpillar never articulates how the source code would have to be modified, or why a POSA would know how to modify it. In any event, Caterpillar's admission that the source code would need to be modified in order for the PM565 to practice the claimed method defeats the position that the PM565 anticipates claim 11. CX-0007C (Meyer Rebuttal WS) Q321.

Wirtgen Br. at 183.

Caterpillar's entire reply for claim 11 is:

Wirtgen's primary rebuttal for Caterpillar's evidence showing that claim 11 is invalid is its "raised position" and "litigation-driven demonstration" arguments from claim 1, which it incorporates by reference. Wirtgen PostHBr. at 183-184. In addition, Wirtgen argues that Dr. Alleyne's suggestion that a POSITA would have known that, because the ski and drum are fixed to the machine, they could have used basic principles of geometry and modify the source code to determine the distance between the raised milling drum and the ground or an obstacle and arrive at this limitation defeats its anticipation argument. *Id.* at 183. However, Dr. Alleyne made this point in support of his obviousness analysis for claim 11, which Wirtgen does not rebut.

Caterpillar Reply at 52.

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The administrative law judge has determined that Caterpillar has not shown, through clear and convincing evidence, that claim 11 would have been obvious for the same reasons that claim 1 would not have been obvious. Additionally, Dr. Alleyne's passing references to "common sense" and the "obvious to try" doctrine, *see, e.g.*, RX-0985C (Alleyne WS) at Q/A 579-80, 587-90, are conclusory assertions that are inadequate to support an obviousness finding. *See In re Van Os*, 844 F.3d 1359, 1361 (Fed. Cir. 2017) (absent an articulated rationale, stating that a modification or combination "of prior art would have been 'common sense' or 'intuitive' is no different than merely stating the combination 'would have been obvious.'").⁶⁰ Further, the testimony does not clearly delineate between an obviousness argument based on the PM-565 alone or a combination of the PM-565 and PM-465. Accordingly, the administrative law judge has determined that claim 11 would not have been obvious based on the PM-565 alone or "in combination with the knowledge of a POSITA."

⁶⁰ In *In re Eli Lilly & Co.*, 902 F.2d 943, 945 (Fed. Cir. 1990) (citing to *In re O'Farrell*, 853 F.2d 894 (Fed. Cir. 1988)), the Federal Circuit explained that "An 'obvious-to-try' situation exists when a general disclosure may pique the scientist's curiosity, such that further investigation might be done as a result of the disclosure, but the disclosure itself does not contain a sufficient teaching of how to obtain the desired result, or that the claimed result would be obtained if certain directions were pursued." *Lilly* found the claims-at-issue obvious because (at least in part) the prior art, Berger, did more than merely invite experimentation. *Id.* at 948 ("The Berger disclosure does not merely invite experimentation, for Berger states that this specific product has the specific property of aiding weight gain in animals, naming cattle and sheep."). Likewise, in a post-KSR case addressing the obvious-to-try doctrine, the Federal Circuit explained that "it would not be 'obvious to try' when the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful." *Sanofi-Aventis Deutschland GmbH v. Glenmark Pharm. Inc., USA*, 748 F.3d 1354, 1360 (Fed. Cir. 2014) (quotation marks to *O'Farrell* omitted); *see also In re Rosuvastatin Calcium Patent Litig.*, 703 F.3d 511, 518 (Fed. Cir. 2012) (the Federal Circuit has "explained that obviousness is not shown when what was 'obvious to try' was to explore a new technology or general approach that seemed to be a promising field of experimentation, where the prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it." (quotation marks to *O'Farrell* omitted)).

4. Claim 17

Caterpillar argues, in part:

As explained in connection with claim element [1.e], it would have been obvious to a POSITA to attach the kickback ski of the PM-565 cold planer to the scraper door to detect a kickback condition during reverse travel of the machine. [RX-0985C at Q/A 604-606]. This is further supported by the fact that the PM-465 had this exact design where the kickback ski of the PM-465 was mounted on the scraper blade door. *Id.*; Tr. (Meyer) at 249:14-23 (acknowledging that the PM-465 had a kickback ski attached to the scraper blade located behind the milling drum). Therefore, it would have been obvious to a POSITA to integrate the kickback ski design of PM-565 into the scraper blade door to ensure that, if the kickback ski element contacted any obstacles or the ground before the rotor did during reverse travel of PM-565, the rotor would shut off. . . .

Another obvious design alternative for a POSITA, in view of the PM-565 and/or the PM-465, would be to simply make the scraper door itself the sensing device instead of the kickback ski. *See* RX-0985C at Q/A 606. In this arrangement, either pivotal or upward movement of the scraper door after it hit an obstacle or the ground could be monitored. *Id.* Dr. Meyer does not substantively rebut this argument, but instead argues that Dr. Alleyne has improperly relied on hindsight. CX-0007C at Q/A 339-340. This motivation is not driven by hindsight. This design would be a common sense design in view of the PM-565 and/or PM-465, and it would have predictable results and an expectation of success. *See* RX-0985C at Q/A 606. A POSITA would have known that a switch or sensor could be used to detect scraper door movement, similar to the way that the switch/sensor in the PM-565 detects pivotal movement. *Id.* In addition to a POSITA knowing that a switch can be used to detect pivotal movement because of the PM-565 design, a POSITA would know that a switch could also be used to detect vertical movement where upward movement of the scraper blade is the desired sensed movement. *Id.* Under this design, if the sensor/switch detected sufficient movement, a signal would be sent to the CPC, which would result in shutting off the drum during reverse travel—just like the PM-565.

Caterpillar Br. at 176-77.

Wirtgen argues:

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Attaching a kickback ski to the scraper blade does not use the scraper blade as the detection device; it still uses the kickback ski as the detection device. CX-0007C (Meyer Rebuttal WS) Q333. Furthermore, a POSA would have no motivation to move the kickback ski, because there is no problem with the location of the kickback that a POSA would try to solve. Instead, Caterpillar is suggesting that a POSA would invent an entirely new use for the kickback ski. That is not the proper test nor is it true. CX-0007C (Meyer Rebuttal WS) Q335.

Caterpillar next cites the PM465 for disclosing mounting a kickback ski to the scraper. But even if a POSA: 1) mounted the PM565 kickback ski to the scraper; and 2) against all reason, entertained the use of the kickback ski as “a reverse travel safety feature” (as Caterpillar would like to believe), the narrow width profile of the kickback ski would, at most, monitor a very small transverse area, which is unlikely to detect a discrete object before reaching the milling drum. The vast majority of the milling drum would be unprotected by a kickback ski, even if the kickback ski were mounted on a scraper blade. For example, if the object were aligned with the left or right side of the milling drum, the kickback ski would not detect the object before it reached the milling drum. In fact, the narrow width of the kickback ski makes it especially undesirable to use in the claimed method. CX-0007C (Meyer Rebuttal WS) Q336. For these reasons, one of skill in the art would not have been motivated to modify the kickback ski location in this way.

As discussed above, the alleged rationale for this proposed modification—to ensure that the kickback ski contacted any obstacles or the ground before the rotor did during reverse travel—ignores the intended function of the PM565 kickback ski. The kickback skis are designed to detect a sudden change in direction due to kickback caused by the milling drum encountering an extremely hard object while milling in the *forward direction*. A POSA would have understood that the PM565 kickback ski was not designed to detect an object before it reaches the milling drum while the machine is *traveling in reverse*. CX-0007C (Meyer Rebuttal WS) Q337.

As an alternative to moving the kickback ski to the scraper blade, Caterpillar argues that one could have “simply ma[de] the scraper door itself the sensing device instead of the kickback ski.” RX-0985C.0154 (Alleyne Direct WS). Caterpillar points to no prior art that discloses a scraper door as any kind of sensing device appropriate for the claimed method. Indeed, this is the very claim element specifically recited in claim 17 that Caterpillar seeks to

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invalidate. A conclusory allegation that POSA could have come up with the claimed invention falls well short of an adequate showing of obviousness. Using the claims as a blueprint for an invalidity analysis is impermissible hindsight. CX-0007C (Meyer Rebuttal WS) Q339; *Yamanouchi*, 231 F.3d at 1343. Caterpillar therefore has failed to show that the PM565 alone or in combination with the PM465 renders claim 17 obvious.

Caterpillar also argues, for claims 1, 7, 11, and 17, that RX-0001 (PM565 OMM), RX-0002 (PM565 Parts), and RX-1122 (PM565 STMG) together or in further combination with the “PM465 machine or manuals” render the claims obvious. Even if the manuals were proper prior art—which as discussed above they are not—Caterpillar fails to articulate the basic requirements for a showing of obviousness. Caterpillar alleges only that “it would have been obvious to one of ordinary skill in the art to combine these manuals because they were intended to be used in conjunction with one another....” A proper showing of obviousness requires a reason to make the combination *to arrive at the claimed invention*. While it might have been natural for a POSA to view the manuals together, Caterpillar makes no allegation whatsoever that in combining the manuals, a POSA would have arrived at any of the claims it challenges. CX-0007C (Meyer Rebuttal WS) Q342.

Caterpillar also fails to identify with particularity the “PM465 manuals” it relies on in the alternative. Even if it had, it would be unable to show that any of claims 1, 7, 11, or 17 would have been obvious because all of Caterpillar’s arguments are based on the kickback ski. CX-0007C (Meyer Rebuttal WS) Q343. The additional manuals fail to show that the Asserted Claims would have been obvious in view of the PM565, PM465, and the accompanying manuals.

Wirtgen Br. at 185-87.

Caterpillar replies, in part:

As Caterpillar explained in its post-hearing brief, although PM 565 does not disclose attaching a kickback ski to its rotor housing door, as disclosed by PM 465, it was well known in the art to position a kickback ski on the rotor housing door. It would have been obvious to a POSITA to attach the kickback ski of the PM 565 cold planer to the scraper door to detect a kickback condition during reverse travel of the machine, as supported by the PM-465, which had this exact design with the kickback ski mounted on the scraper blade door.

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Caterpillar Reply at 52-53.

a) Obviousness Based on the PM-565 Alone

Having considered Caterpillar's arguments and Dr. Alleyne's testimony, the administrative law judge has determined that Caterpillar has failed to show that claim 11, assuming use of the PM-565 before the critical date, would have been obvious in light of the PM-565 alone. Specifically, Caterpillar's arguments and Dr. Alleyne's opinions reference the PM-565 and PM-465 simultaneously, which means that neither Caterpillar nor Dr. Alleyne truly addresses the PM-565 on its own. Accordingly, Caterpillar has failed to show that claim 17 would have been obvious based on the PM-565 alone or "in combination with the knowledge of a POSITA."

b) Obviousness Based on the PM-565 in View of the PM-465

(1) Attaching the Kickback Ski to the Scraper Door

The administrative law judge previously determined that element [1.e] was not known or obvious in light of the PM-565 or PM-465. Neither Caterpillar nor Dr. Alleyne has not shown that considering the PM-565 in view of the PM-465 cures this deficiency. *See* CX-0007C (Meyer WS) at Q/A 304 ("as with the PM-565 . . . [the PM-465's] kickback ski designed to slide along the ground and check for a kickback event which involves a rapid change from a forward movement to a reverse movement while milling").⁶¹ Further, Dr. Alleyne has not fully explained how moving the kickback ski would affect the ski's ability to detect kickback when the PM-565 is milling in the forward direction. *See* CX-0007C (Meyer WS) at Q/A 297-98.

⁶¹ Dr. Alleyne's testimony for claim 17 relies upon his analysis for element [1.e]. *See, e.g.*, RX-0985C (Alleyne WS) at Q/A 604-05.

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Accordingly, the administrative law judge has determined that claim 17 would not have been obvious based on the PM-565 in view of the PM-465.

(2) Using the Scraper Door as the Sensing Device

The administrative law judge has determined that neither Caterpillar nor Dr. Alleyne has shown that a person of ordinary skill in the art, at the time the application that would lead to the '641 Patent was filed, would have appreciated using the scraper door as a sensing device that contributes to uncoupling a milling drum. In particular, Dr. Alleyne's appears to use the teachings and suggestions from the '641 Patent in opining that claim 17 would have been obvious. *See Para-Ordnance Mfg., Inc. v. SGS Importers Int'l, Inc.*, 73 F.3d 1085, 1087 (Fed. Cir. 1995) (obviousness "may not be established using hindsight or in view of the teachings or suggestions" of the patent); *cf. InTouch Techs., Inc. v. VGO Commc'ns, Inc.*, 751 F.3d 1327, 1351 (Fed. Cir. 2014) (critiquing an expert who appeared to the patent-in-suit as a "roadmap" for her obviousness opinion). Dr. Alleyne testified as follows:

Q606. In your opinion, were there any other design alternatives for a POSITA in view of PM-565 and PM-465?

A: Yes. Another obvious design alternative for a POSITA, in view of the PM-565 and/or the PM-465, would be to simply make the scraper door itself the sensing device instead of the kickback ski. In this arrangement, either pivotal or upward movement of the scraper door after it hit an obstacle or the ground could be monitored. A POSITA would have known that a switch or sensor could be used to detect scraper door movement, similar to the way that the switch/sensor in the PM-565 detects pivotal movement. In addition to, a POSITA knowing that a switch can be used to detect pivotal movement because of the PM-565 design, a POSITA would know that a switch could also be used to detect vertical movement in the situation where upward movement of the scraper blade is the desired sensed movement. Under this design, if the sensor/switch detects sufficient movement, a signal could be sent to the CPC, which would result in shutting off the drum during reverse travel—just like the PM-565 design. This design would be a common sense design

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in view of the PM-565 and/or PM-465, and it would have predictable results and an expectation of success.

RX-0985C (Alleyne WS) at Q/A 606. Claiming that the scraper door would be an “obvious design alternative” is the type of “*ex post* reasoning KSR warned of and fails to identify any actual reason why a skilled artisan would have combined [or modified] the elements in the manner claimed.” *In re Van Os*, 844 F.3d at 1361. Accordingly, the administrative law judge has determined that, given the testimony presented, modifying the PM-565 to use the scraper door would not have been an obvious modification that would render claim 17 invalid.

H. Obviousness – “PM 465 alone and in combination with the knowledge of a POSITA”

Caterpillar argues that claim 1, 7, 11, and 17 are “obvious over PM 465 alone and in combination with the knowledge of a POSITA.” Caterpillar Br. at 178.

1. Claim 1⁶²

Caterpillar argues element [1.e] is “[e]xpressly disclosed by PM-465; or obvious over PM-465[.]” Caterpillar Br. at 184. Caterpillar cites to Dr. Alleyne’s witness statement, RX-0985C (Alleyne WS) at Q/A 650-668. *Id.* at 184-87. Caterpillar’s entire reply for element [1.e] follows:

Finally, Wirtgen argues that Element [1.e] is not anticipated by PM-465. *Id.* at 189. Wirtgen argues that its machines, which detect vertical movement of the scraper door, is “substantially different” than the PM-465, which detects pivoting movement of the kickback ski with a proximity switch. *Id.* However, this argument requires Wirtgen to read in an additional limitation (*i.e.*, that the required deviation be detected by a vertical displacement) that is found neither in the claim nor in either party’s construction.

Caterpillar Reply at 54.

⁶² As with anticipation, Caterpillar has not shown that claim 1 would have been obvious if the monitoring device paragraph (*i.e.*, element [1.e]) is subject to § 112(6)).

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The administrative law judge previously determined that Caterpillar has not shown, through clear and convincing evidence, that the PM-465 includes a monitoring device that monitors a distance between the milling drum and the ground surface and uncouples the raised milling drum when the monitoring device detects a deviation that falls below a pre-determined distance. The testimony that Caterpillar cites, RX-0985C (Alleyne WS) at Q/A 650-668, devotes just one question to obviousness:

Q667. What is your conclusion about whether the PM-465 discloses this limitation?

A: For these reasons, it is my opinion that the PM-465 in view of the knowledge of a POSITA discloses or suggests an automotive construction machine having a monitoring device that monitors a distance between the milling drum and the ground surface and uncouples the raised milling drum from the drive engine when the monitoring device detects a deviation that falls below a pre-determined distance, as recited in claim 1. In other words, it would have been obvious to arrive at the design in claim 1 when considering the prior art PM-465 machine. Accordingly, I conclude that claim 1 is obvious under 35 U.S.C. § 103.

RX-0985C (Alleyne WS) at Q/A 667. This testimony does not discuss any modifications to the PM-465, nor does it present any analysis that is separate from the anticipation analysis. This is not sufficient to show that element [1.e] would have been obvious in light of the PM-465.

Accordingly, the administrative law judge has determined that element [1.e] would not have been obvious based on the PM-465 alone or “in combination with the knowledge of a POSITA.”

2. Claim 7

Caterpillar argues “the additional limitations of claim 7 are anticipated or rendered obvious by PM-465.” Caterpillar Br. at 187 (citing RX-0985C (Alleyne WS) at Q/A 669-677). The majority of Caterpillar’s argument focuses on anticipation. *See id.* at 187-89. The only portion of Caterpillar’s brief that addresses obviousness is the last sentence, which states “Even

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if the PM-465 kickback ski did not project below the milling drum, it would have been obvious to a POSITA to modify the kickback ski of the PM-465 in this way.” *Id.* at 189. Dr. Alleyne’s testimony similarly discusses claim 7, but it only explicitly mentions obviousness in a capstone question. *See, e.g.,* RX-0985C (Alleyne WS) at Q/A 677.

Caterpillar’s Reply does not distinguish between anticipation and obviousness. *See* Caterpillar Reply at 54-55.

Caterpillar bears the burden of proving invalidity and has the responsibility of presenting a cogent argument. It has failed to do so. In particular, neither Caterpillar’s arguments nor Dr. Alleyne’s testimony clearly address obviousness. Without a specific argument, Caterpillar’s argument is nothing more than a plea to find claim 7 obvious if its anticipation argument is unsuccessful. Indeed, neither the argument nor the testimony fully addresses the differences between the PM-465 and claim 7. *See Graham v. John Deere*, 383 U.S. at 17-18 (1966) (“Under § 103, the scope and content of the prior art are to be determined [and the] differences between the prior art and the claims at issue are to be ascertained[.]”); *KSR*, 550 U.S. at 406-07 (quoting *Graham*). Accordingly, the administrative law judge has determined that claim 7 would not have been obvious based on the PM-465 alone or “in combination with the knowledge of a POSITA.”

3. Claim 11

Caterpillar argues that “For all the reasons explained above in the claim 1 analysis, Caterpillar has established by clear and convincing evidence that claim 11 is: anticipated by PM-465 under 35 U.S.C. § 102(b); obvious under 35 U.S.C. § 103 in view of PM-465 in combination with the knowledge of a POSITA.” Caterpillar Br. at 190. Caterpillar’s entire reply is:

To rebut Caterpillar’s evidence showing that claim 11 is invalid, Wirtgen incorporates its arguments from claim 1 by reference.

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Wirtgen PostHBr. at 191. These arguments have been addressed above and in Caterpillar's post-hearing brief.

Caterpillar Reply at 55.

The administrative law judge previously determined that Caterpillar has not shown claim 1 would have been obvious. Caterpillar's arguments for claim 11 do not present any independent reason for finding that claim 11 would have been obvious. Accordingly, the administrative law judge has determined that claim 11 would not have been obvious based on the PM-465 alone or "in combination with the knowledge of a POSITA."

4. Claim 17

Caterpillar argues:

As explained above, claim 17 is the only asserted claim that does specify what the sensing device must be (the scraper blade) and where it must be located (behind the milling drum). Under the second *Graham* factor, the difference between the claim and the prior-art is that PM-465 discloses the kickback ski attached to the scraper door as the sensor, while the claim requires the scraper blade as the sensor. However, to the extent PM-465 does not expressly meet this limitation, it would have been obvious to modify PM-465 to arrive at this limitation.

Motivation to Modify the PM-465

As explained above in connection with element [1.e], the PM 465 discloses a kickback ski attached to the scraper blade. RX-0985C (Alleyne Direct Witness Statement) at Q/A 720. Therefore, the kickback ski design of PM 465 was already integrated into the scraper blade door to ensure that, if the kickback ski element contacted any obstacles or the ground before the rotor did during reverse travel of PM 465, the rotor would shut off. . . .

Another obvious design alternative for a POSITA, in view of the PM-465, would be to make the scraper door itself the sensing device instead of the kickback ski. See RX-0985C at Q/A 722. In this arrangement, either pivotal or upward movement of the scraper door after it hit an obstacle or the ground could be monitored. *Id.* As he did with the PM-565, Dr. Meyer does not substantively rebut this argument, but instead argues that Dr. Alleyne has improperly relied on hindsight. CX-0007C at Q/A 375-376. As discussed above with

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respect to the PM-565 analysis, this motivation is not driven by hindsight. This design would be common sense in view of the PM-465, and it would have predictable results and an expectation of success. *See* RX-0985C at Q/A 722. Under this design, if the sensor/switch detects sufficient movement, a signal could be sent to the ECM, which would result in shutting off the drum during reverse travel.

Caterpillar Br. at 192-93 (Caterpillar's critique of Dr. Meyer's testimony is omitted).

Wirtgen argues:

Caterpillar appears to argue that because the PM465 discloses a kickback ski attached to the scraper blade, somehow using the scraper blade itself as the sensor would have been obvious. First, a POSA would have understood that a kickback ski is a separate component from the scraper blade, which defines the rear of the drum housing. The pivotal motion of the PM465 machine's kickback ski, not movement of the scraper blade, triggers the uncoupling of the milling drum upon a kickback event in the PM465. Accordingly, a POSA would not deem the PM465's scraper blade to be a sensing device and the PM465 does not teach or suggest using the scraper blade as a sensor. CX-0007C (Meyer Rebuttal WS) Q374.

Second, the argument that a POSA would simply make the scraper door itself the sensing device instead of the kickback ski is completely unsupported. Caterpillar does not provide any evidence that the scraper blade could sense anything or move upwards when traveling in reverse. None of the PM465 manuals or any other evidence support that position. Moreover, Caterpillar does not articulate a single rationale for making this modification. Although it argues that a POSA could do it, Caterpillar fails to show why a POSA would do it. This proposed modification appears to be driven solely by hindsight and is therefore improper. CX-0007C (Meyer Rebuttal WS) Q375. PM465 does not render obvious claim 17.

Wirtgen Br. at 193-94.

Caterpillar replies that "the PM-465 discloses a kickback ski attached to the scraper blade. . . . Therefore, the kickback ski design of PM-465 was already integrated into the scraper blade door to ensure that, if the kickback ski element contacted any obstacles or the ground

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before the rotor did during reverse travel of PM-465, the rotor would shut off.” Caterpillar Reply at 55.

The administrative law judge previously determined that element [1.e] was not known or obvious in light of the PM-465. Neither Caterpillar’s argument nor Dr. Alleyne’s testimony cures this deficiency. *See* CX-0007C (Meyer WS) at Q/A 367.⁶³ Further, Dr. Alleyne has not fully explained how modifying the kickback ski would affect the ski’s ability to detect kickback when the PM-465 is milling in the forward direction. *See* CX-0007C (Meyer WS) at Q/A 371. Accordingly, the administrative law judge has determined that claim 17 would not have been obvious based on the PM-465 alone or “in combination with the knowledge of a POSITA.”

I. Obviousness – Secondary Considerations

Wirtgen argues that evidence of copying, commercial success, and the praise of others indicates that the ‘641 Patent would not have been obvious. *See* Wirtgen Br. at 194-98.

Caterpillar argues that “Wirtgen’s alleged secondary considerations are unsupported by the evidence[.]” Caterpillar Br. at 197.

1. Copying

Wirtgen argues that Caterpillar [

]. Wirtgen Br. at 194-96. Wirtgen argues, in part:

Caterpillar’s infringing milling machines [

]. CX-0007C (Meyer Rebuttal WS) Q389; CX-0171 (Exemplary Claim Chart Showing Infringement of the 641 Patent by the Accused Products). Caterpillar’s [

].

Caterpillar had [

⁶³ Dr. Alleyne’s testimony for claim 17 relies upon his analysis for element [1.e]. *See, e.g.*, RX-0985C (Alleyne WS) at Q/A 604-05 (discussing the PM-565), 720-21 (discussing the PM-465).

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622:13-19 (Clark) ([]). Hearing Tr.

started [], Caterpillar

[].
Hearing Tr. 697:11-698:12 (Engelmann); *id.* at 684:25-686:17
(documenting []); CX-
0980C.0037-0039 (All CPLN GW1 Review); CX-0324C.0022-
0024 (All CPLN GW1 Review - 2).

...

Several of Caterpillar's []). Caterpillar's []

[]. CX-0567C.0016 Row
122 and CX-0567C.0020 Row 229 (W210 Ranked Features List).
A similar feature, "[

]". CX-0567C.0005 Row 136 and
CX-0567C.0015 Row 104 (W210 Ranked Features List). Further,
in CX-0564C.0107 (CPLN Trade-Off Kick-Off), one of the "[

])" and as discussed previously, the []). CX-
0007C (Meyer Rebuttal WS) Q396. []

[], is
strong evidence of copying supporting the nonobviousness of the
'641 patent.

Id.

Caterpillar replies, in part, that Wirtgen did not rebut Mr. Engelmann's testimony.

Caterpillar Reply at 57.

Having considered the parties' arguments, the administrative law judge has determined
that Wirtgen has presented some evidence of copying. The evidence shows that Caterpillar

[

]". The documentary evidence also

shows that Caterpillar [

]. See CX-0564C

(CPLN Trade-Off Kick-Off) at 107; Engelmann Tr. 687-688; CX-0568C (PM600 Hydraulics Presentation) at 3, 5; CX-0307C (NPI Manual) at 47. Wirtgen, however, does not address the software in the Caterpillar machines, which Mr. Engelmann testified was developed by Caterpillar. See Engelmann Tr. 744.

2. Commercial Success

Wirtgen argues that its “DI milling machines are commercial embodiments of the ‘641 patent” and that the “features-at-issue in the ‘641 patent not only resulted in improved milling machine performance, but these features also provided Wirtgen America with economic gains as well.” Wirtgen Br. at 196-97 (citing, *inter alia*, CX-0009C (Mulhern RWS) at Q/A 74-76, 78). Wirtgen’s Brief and Reply does not cite any advertising material related to the ‘641 Patent. See *id.*; Wirtgen Reply at 71-72.

The evidence does not show that any of Wirtgen’s products were a commercial success vis-à-vis the ‘641 Patent. To support its commercial success argument, Wirtgen points to sales of its DI products since 2014. CX-0009C (Mulhern RWS) at Q/A 18-19 (identifying [] machine sales totaling [] million in revenue). For the ‘641 Patent, Ms. Mulhern identifies [] machine sales, which totaled [] million in revenue. *Id.* at Q/A 19. Caterpillar does not dispute the significance of the sales volume and revenue. See Caterpillar Br. at 56-57.

Wirtgen, however, has not demonstrated that the alleged success is attributable to any feature(s) claimed in the ‘641 Patent. While Wirtgen argues it is entitled to a presumption on nexus, the very authority it cites—*WBIP v. Kohler*—says that there is no presumption “where the patented invention is only a component of the product to which the asserted objective

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considerations are tied.” *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1329 (Fed. Cir. 2016).

While Wirtgen cites CX-0007C (Meyer RWS) at Q/A 404 as evidence that the driving-safely-backwards feature improved “performance” and “reduced machine downtime” there is only weak anecdotal evidence to support Mr. Meyer’s opinion. *See* CX-0007C (Meyer RWS) at Q/A 406 (citing RX.0998C 24:9-26:4, 27:8-28:10 (Berning Deposition Transcript)).⁶⁴ Accordingly, Wirtgen has not shown that the products were commercially successful due to reverse-driving feature claimed in the ‘641 Patent.

3. Industry Acclaim and Praise of Others

With respect to industry praise, the Federal Circuit has explained:

Evidence that the industry praised a claimed invention or a product which embodies the patent claims weighs against an assertion that the same claim would have been obvious. Industry participants, especially competitors, are not likely to praise an obvious advance over the known art. Thus, if there is evidence of industry praise in the record, it weighs in favor of the nonobviousness of the claimed invention.

WBIP, LLC v. Kohler Co., 829 F.3d 1317, 1334 (Fed. Cir. 2016).

Wirtgen’s entire argument is:

Wirtgen America’s patented backwards driving technology as also received widespread recognition from its customers and others in

⁶⁴ Mr. Berning’s testimony does not provide a quantitative basis to evaluate Wirtgen’s claims of improved performance and decreased downtime. Further, Mr. McEvoy, Wirtgen America’s CEO, testified that customers buy Wirtgen products because its machines include a “number of” features and because of Wirtgen America’s (claimed) superior product support. *See* CX-0003C (McEvoy WS) at Q/A 25 (testifying that customers buy Wirtgen products because “. . . Second, Wirtgen America’s product support is the best in the industry.”); *see also* CX-0008C (Mulhern WS) at Q/A 102 (discussing 23,500 technical support calls received since 2014); CX-0002C (Schmidt WS) at Q/A 69 (explaining that Wirtgen’s technical support is available 24 hours a day, seven days a week and that “As soon as Wirtgen America receives a communication from a customer, the technical staff put the wheels in motion to address the issue.”); RX-0989C (Reed RWS) at Q/A 150 (Wirtgen has been the leading supplier of milling equipment for decades.”), Q/A 155-56 (“Ms. Mulhern has not shown a temporal link between sales growth and the patented features.”).

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the industry, further supporting a determination of nonobviousness.

[
]. See, e.g., CX-0601C (Subsystem Components Survey); CX-0571C (Partial VOC List); and CX-0566C (Controls & Electrical Ideas Review). One commenter stated that “[

].”

Wirtgen Br. at 198.

Caterpillar argues:

Wirtgen’s assertion that the ‘641 patent has received praise is also unsupported by evidence. Similar to its arguments with respect to commercial success, Wirtgen’s industry acclaim arguments are based on the incorrect premise that it invented the entire concept of reverse travel shutoff and the resulting ability to safely travel backwards with the rotor operating. This is incorrect for the same reasons explained above.

Notably, Wirtgen relies almost exclusively on Caterpillar documents to show that [

]. See, e.g., CX-0007C at Q/A 413-415. Dr. Meyer and Ms. Mulhern have not identified any Wirtgen documents showing that their machines received acclaim or praise because of their reverse travel shutoff feature. Moreover, Wirtgen provides no specific evidence of a nexus between the alleged industry acclaim and praise of its products and the *specific features* recited in claims 1, 7, 11, and 17 of the ‘641 patent. Without this showing of nexus, Wirtgen’s alleged industry acclaim and praise of others has no legal bearing on the question of whether claims 1, 7, 11, and 17 of the ‘641 patent were obvious at the time of the invention. Accordingly, Wirtgen has failed to establish “industry praise” as a relevant secondary consideration for these claims.

Caterpillar Br. at 200-01.

Wirtgen’s entire reply is:

Caterpillar’s only rebuttal to Wirtgen America’s extensive evidence of industry acclaim and praise of others is to state that most of the evidence came from Caterpillar’s own documents, and not “Wirtgen documents.” Cat. PH Br. at 199. That observation is entirely

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inconsequential. There is no requirement that the source of objective indicia be “Wirtgen documents.” Caterpillar cannot seriously contend that its own documents are somehow unreliable. The evidence unequivocally shows that customers praised [] Wirtgen’s technology.

Wirtgen Reply at 72.

Having considered the parties’ arguments, the administrative law judge has determined that Wirtgen has not shown that the industry praise is related to the ‘641 Patent. To begin, Wirtgen’s generic citations to CX-0601C, CX-0571C, and CX-0566C, *see* Wirtgen Br. at 198, are not helpful in determining whether or not the industry praised features claimed by the ‘641 Patent. Further, Wirtgen’s earlier citations to “CX-0571C.0057” and “CX-0566C.0012”, *see* Wirtgen Br. at 197-98, do not reference a monitoring device, which is essential to all of the asserted claims. Thus, the evidence Wirtgen has cited does not show industry praise or praise by others.

4. Weighing the Secondary Considerations

On the whole, the administrative law judge has determined that the secondary considerations do not provide a material rebuttal to an obviousness argument, as the evidence of copying is modest and the commercial-success and industry-praise evidence does not support Wirtgen’s arguments. In any event, a rebuttal is not necessary because Caterpillar has not shown that the asserted claims are *prima facie* obvious. *See Transocean, supra*.

VI. U.S. Patent No. 9,644,340

A. Overview of the ‘340 Patent (JX-0001)

The ‘340 Patent, entitled “Scraper device, as well as construction machine” issued on May 9, 2017. The application that would issue as the ‘340 Patent, Application No. 15/409,670, was filed on January 19, 2017. The application claims priority to German Application 10 2007

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038 677, which was filed on August 15, 2007. The '340 Patent is directed to a two-part scraper blade that features a pivot point below a swiveling axis. *See generally* JX-0001 at Abstract.

Wirtgen asserts claims 4 (which depends from claim 1), 5, 9, and 12. *See* Wirtgen Br. at 43-53. Claims 1, 4, 5, 9, and 12 are reproduced below:

1. A construction machine, comprising:

a machine frame;

a milling drum mounted to rotate about a milling drum axis, the milling drum axis being fixed relative to the machine frame;

a scraper blade located behind the milling drum with reference to a direction of travel of the construction machine, the scraper blade including an upper part and a lower part, the lower part being movable in a sliding non-pivotal motion relative to the upper part;

a lifting actuator connected between the upper and lower parts to slide the lower part relative to the upper part between a downward extended position and an upward retracted position; and

a swiveling actuator separate from the lifting actuator, the swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to extend to pivot the scraper blade upward about a swiveling axis parallel to and spaced apart from the milling drum axis.

* * *

4. The construction machine of claim 1, wherein: the swiveling actuator is pivotally connected to the upper part of the scraper blade at a pivotal connection having a pivotal axis lower in height than the swiveling axis.

* * *

5. The construction machine of claim 4, wherein: the swiveling axis is offset rearward from the pivotal axis of the pivotal connection relative to the direction of travel.

* * *

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9. A construction machine, comprising:

a machine frame;

a milling drum mounted to rotate about a milling drum axis, the milling drum axis being fixed relative to the machine frame;

a scraper blade located behind the milling drum with reference to a direction of travel of the construction machine, the scraper blade including an upper part and a lower part;

a lifting actuator connected between the upper and lower parts to move the lower part relative to the upper part between a downward extended position and an upward retracted position; and

a swiveling actuator separate from the lifting actuator, the swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to pivot the scraper blade between an operating position and a raised position about a swiveling axis parallel to and spaced apart from the milling drum axis;

wherein:

the swiveling actuator is connected to the fixed part at a machine side pivotal connection;

the swiveling actuator is connected to the scraper blade at a blade side pivotal connection, a pivotal axis of the blade side pivotal connection being lower in height than the swiveling axis; and

the swiveling axis is offset rearward from the pivotal axis of the blade side pivotal connection when the scraper blade is in the operating position.

* * *

12. The construction machine of claim 9, wherein: a pivotal axis of the machine side pivotal connection is located forward of the pivotal axis of the blade side pivotal connection.

JX-0001 at 6:47-8:19.

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B. Claim Construction

1. Level of Ordinary Skill in the Art

For all of the asserted patents, Wirtgen argues:

Wirtgen America submits that a person of ordinary skill in the art as of the filing dates of the Asserted Patents is one who has either: (1) a bachelor's degree (or equivalent) in mechanical engineering or a similar field, and two to five years of experience working on mobile construction machine design or in a similar field; or (2) seven to ten years of experience working on mobile construction machine design or in a similar field. Caterpillar similarly contends that a person of ordinary skill in the art would have either: (1) a bachelor's degree in mechanical engineering or an equivalent degree, and two to five years of experience working on mobile construction machine design, or (2) seven to ten years of experience working on mobile construction machine design. Accordingly, the parties have effectively no dispute over the level of ordinary skill in the art.

Wirtgen Br. at 25.

Caterpillar argues:

A person of ordinary skill in the art ("POSITA") at the time of the alleged invention would have had: 1) a bachelor's degree in mechanical engineering or an equivalent degree, and two to five years of experience working on mobile construction machine design, or machines of comparable complexity; or 2) seven to ten years of experience working on mobile construction machine design. RX-0984C at Q/A 51. Wirtgen's proposed level of skill in the art is not materially different, and neither party has argued that the outcome of this case depends on which party's POSITA definition is adopted. *Id.* at Q/A 53.

Caterpillar Br. at 20. Caterpillar proposes the same level of ordinary skill for the '309, '530, and '641 Patents. *Id.* at 75 (addressing the '530 Patent), 152 (addressing the '641 Patent), 229 (addressing the '309 Patent).

The administrative law judge has determined that a person of ordinary skill in the art would have (1) a bachelor's degree (or equivalent) in mechanical engineering or a similar field, and two to five years of experience working on mobile construction machine design or in a

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similar field or (2) seven to ten years of experience working on mobile construction machine design. *See* CX-0006C (Meyer WS) at Q/A 31; RX-0984C (Fronczak WS) at Q/A 51; *see also* Part IV(B)(1), *supra*.

2. Disputed Construction

The parties dispute just one term—“operating position”—which appears in claim 9. *See* Wirtgen Br. at 47; Caterpillar Br. at 20-21.

The parties propose the following constructions for the disputed term:

Wirtgen's Proposed Construction	Caterpillar's Proposed Construction
“angular position corresponding to the milling operation”	“a position that allows for milling operation”

See Wirtgen Initial Claim Construction Br. at 12; Caterpillar Br. at 229.

Wirtgen argues, in part:

A person of ordinary skill in the art reading the ‘340 patent would understand the term “operating position” to refer to an angular position of the scraper blade that corresponds to the milling operation. For example, claim 9 uses “operating position” to refer to one of the two angular positions of the scraper blade. The scraper blade swivels between an operating position that is essentially orthogonal to the ground and a raised position that is essentially parallel to the ground. Velinsky at ¶30.

Claim 9 provides the best evidence of the meaning of “operating position,” where the term appears as a limitation of the swiveling actuator. ‘340 patent 7:39-46. The swiveling actuator is configured to “pivot” the scraper blade between the different angular positions. *Id.* A person of ordinary skill in the art would understand the term “pivot” refers to a rotation around a point or axis. The swiveling actuator has nothing to do with whether the scraper blade is extended or retracted. Claim 1 similarly recites that the swiveling actuator element pivots the scraper blade between the operating position and raised position “about a swiveling axis,” confirming that the terms “pivot” and “swivel” refer to movement between angular positions. Velinsky at ¶31.

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Wirtgen Initial Claim Construction Br. at 13. Wirtgen also argues that its construction is consistent with the specification. *Id.* at 13-14.

Caterpillar argues that the word “operating” means “to perform a function” and that the ‘340 Patent’s specification “uses ‘operating position’ in precisely this manner.” Caterpillar Initial Claim Construction Br. at 8-9 (citing Ex. 2 at 8, which is a page from the American Heritage College Dictionary). Caterpillar argues that the specification describes that “the invention” is “the scraper blade, when in operating position, is engaged with lateral retaining devices in the lateral walls, which retain the scraper blade in a position running essentially orthogonally to the ground surface.” *Id.* at 9 (citing JX-0001 at 1:59-66). Caterpillar also argues that Figure 2 shows the scraper blade “running essentially orthogonally to the ground surface” when in an “operating position.” *Id.* (quoting JX-0001 at 4:60-63; Caterpillar also points to Figure 5).

Wirtgen replies, in part:

A person of ordinary skill in the art would not consider the term “operating” in isolation, as urged by Respondents. *See* Resp. Br. at 8 (arguing that the term “operating,” by its plain meaning, must refer to the position in which the scraper blade can operate, or perform work). Respondents cite a general-purpose dictionary for the definition of “operate.” *Id.* That general purpose dictionary is so divorced from the present technology that it also includes definitions for operate such as “to carry on a military or naval action” and “to perform surgery.” *See* Resp. Br. Ex. 2 at 8. A person of ordinary skill in the art would not look at a general purpose dictionary to understand the term “operate,” in isolation, especially when the term “operating position” is clearly defined in the specification. Ex. 1, Velinsky Rebuttal at ¶2.

Wirtgen Reply Claim Construction Br. at 2-3.

Caterpillar replies, in part:

Wirtgen complains that “Respondents’ construction limits the operating position to the essentially orthogonal and fully extended

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position of the scraper blade required during active milling,” which, according to Wirtgen, conflicts with the specification’s description of the invention. But that is not so. The “operating position” does not necessarily require that the lower part of the scraper blade be “fully extended” to the ground as Wirtgen contends. The specification states that “the scraper blade, when in operating position, is engaged with lateral retaining devices in the lateral walls, which retain the scraper blade in a position running essentially orthogonally to the ground surface.” Ex. 1 at 1:59-66 (emphasis added). This configuration is shown in Figure 2. *See id.* at 4:60-63. It is true that Figure 2 appears to show the scraper blade in the fully lowered position, but the specification makes clear that the scraper blade can also be in an operating position when not fully lowered. *See id.* at Abstract (“The lower part of the scraper blade is adjustable in height when in operating position . . .”) (emphasis added); *see also id.* at 1:14-16.

Caterpillar Reply Claim Construction Br. at 1-2. Caterpillar also argues that Wirtgen’s construction “improperly imports an “angular position” limitation into the claim and reads ‘operating’ out of the claim.” *Id.* at 3.

In its Post-Hearing Reply, Caterpillar clarifies its arguments as follows:

In its infringement and domestic industry analysis of claims 9 and 12, Wirtgen continues to make a baseless argument that products at issue satisfy these claims under Caterpillar’s construction of “operating position.” For both the Accused Products and the alleged DI products, Wirtgen argues that the scraper blade in a “first orientation—angled substantially downward—that corresponds to the angular position during milling operation” would satisfy Caterpillar’s claim construction. Wirtgen PostHBr. at 48 (infringement); 52 (DI). But this is not the case. ***Caterpillar’s construction requires the scraper blade to be in a position that allows for milling operation.*** Caterpillar PostHBr. at 60. When the Accused Products and the alleged DI products are milling, ***the scraper blade must remain locked into the lateral retaining devices, meaning that the scraper blade cannot pivot from the operating position to the raised position.*** *Id.* at 60, 64-65. Wirtgen has never provided any evidence to dispute this point, and merely continues to make the same flawed arguments that have been refuted time and time again. Wirtgen has failed to show that, under Caterpillar’s construction of “operating position,” it has proven infringement or domestic industry for claims 9 and 12.

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Caterpillar Reply at 6-7 (emphasis added).

The administrative law judge construes “operating position” to mean “angular position corresponding to the milling operation,” which is Wirtgen’s proposed construction. Claim 9 does not require the scraper blade to “remain locked into the lateral retaining devices” when pivoting, as Caterpillar argues. *See* JX-0001 at 7:42-46 (“the swiveling actuator being configured to pivot the scraper blade between an operating position and a raised position about a swiveling axis parallel to and spaced apart from the milling drum axis”). Further, Wirtgen’s proposed construction allows for the lower part of the scraper blade to be raised and lowered in the operating position, which does not exclude disclosed embodiments, defeat the purpose of the invention, or contradict the specification. *See* JX-0001 at 1:51-55 (describing an object of the invention); 1:55-2:22; 4:60-64 (describing the scraper blade being extended while in the operating position); 5:28-32 (referring to the scraper blade being retracted while in the operating position); Abstract (“the lower part of the scraper blade is adjustable in height when in operating position”).

C. Infringement

Wirtgen argues that Caterpillar’s PM600 and PM800 series machines infringe claims 1, 4, 5, 9, and 12. *See* Wirtgen Br. at 43-49. Wirtgen does not argue indirect infringement or infringement under the doctrine of equivalents. *See generally id.*

1. Claim 1

For its infringement analysis, Wirtgen divides claim 1 into six limitations, as follows:

1[p] 1. A construction machine, comprising:

1[a] a machine frame;

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- 1[b] a milling drum mounted to rotate about a milling drum axis, the milling drum axis being fixed relative to the machine frame;
- 1[c] a scraper blade located behind the milling drum with reference to a direction of travel of the construction machine, the scraper blade including an upper part and a lower part, the lower part being movable in a sliding non-pivotal motion relative to the upper part;
- 1[d] a lifting actuator connected between the upper and lower parts to slide the lower part relative to the upper part between a downward extended position and an upward retracted position; and
- 1[e] a swiveling actuator separate from the lifting actuator, the swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to extend to pivot the scraper blade upward about a swiveling axis parallel to and spaced apart from the milling drum axis.

CDX-0002 (Meyer Demonstratives) at 10-15; CX-0006C (Meyer WS) at Q/A 70-99.

a) 1[p] 1. A construction machine

Wirtgen argues that the PM620 is a construction machine as described by the preamble.

See Wirtgen Br. at 43.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 58-61 (Caterpillar disputes limitation 1[c]); Caterpillar Reply at 5-6 (same).

The evidence shows that the PM620 (which is representative of Caterpillar's PM600 and PM800 series products) is a construction machine. *See* CX-0006C (Meyer WS) at Q/A 70-72. Accordingly, the administrative law judge has determined that the PM620 is a construction machine, as the preamble requires.

b) 1[a] a machine frame

Wirtgen argues that the PM620 includes a machine frame. *See* Wirtgen Br. at 43.

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Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 58-61

(Caterpillar disputes limitation 1[c]); Caterpillar Reply at 5-6 (same).

The evidence shows that the PM620 has a machine frame. *See* CX-0006C (Meyer WS) at Q/A 73-74. Accordingly, the administrative law judge has determined that the PM620 includes a machine frame, as limitation 1[a] requires.

- c) ***1[b] a milling drum mounted to rotate about a milling drum axis, the milling drum axis being fixed relative to the machine frame***

Wirtgen argues that the PM620 includes a milling drum that can rotate about its axis, which is fixed relative to the machine frame. *See* Wirtgen Br. at 43.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 58-61 (Caterpillar disputes limitation 1[c]); Caterpillar Reply at 5-6 (same).

The evidence shows that the PM620 has a milling drum that can rotate about its axis, which is fixed relative to the machine frame. *See* CX-0006C (Meyer WS) at Q/A 75-76. Accordingly, the administrative law judge has determined that the PM620 includes a milling drum that can rotate about its axis, which is fixed relative to the machine frame, as limitation 1[b] requires.

- d) ***1[c] a scraper blade located behind the milling drum with reference to a direction of travel of the construction machine, the scraper blade including an upper part and a lower part, the lower part being movable in a sliding non-pivotal motion relative to the upper part***

Wirtgen argues that the PM620 includes a two-part scraper blade behind the milling drum, where the lower part of the scraper blade can slide without pivoting relative to the upper part of the blade. *See* Wirtgen Br. at 43-45.

Caterpillar argues that Wirtgen has not met its burden:

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Wirtgen's evidence shows that the Accused Products have a two-part scraper blade, but do not sufficiently demonstrate that there is no relative pivotal movement between these two parts. For example, Wirtgen's expert Dr. Meyer cites to a number of Caterpillar documents that illustrate the components of the scraper blade, and explain that the two parts are connected. CX-0006C (Meyer Opening WS) at Q/A 78-81. None of these documents describe the relative motion of the two parts of the scraper blade as non-pivotal. Dr. Meyer does not point to any particular structure that would prevent the upper part from pivoting relative to the lower part. RX-0990C (Fronczak Rebuttal Witness Statement) at Q/A 45; Tr. (Fronczak) at 556:12-557:16.

Dr. Meyer's counterarguments are equally unpersuasive. For example, he argues that because he saw a PM620 firsthand, this proves that the non-pivotal limitation is met—however, Dr. Meyer does not provide any details of the condition of his inspection. CX-0006C at Q/A 85-86. Dr. Meyer admitted that he did not include any data from his inspection in his analysis, and did not develop any testing protocol—essentially, that his analysis was based solely on the fact that he “visually saw the motion.” Tr. (Meyer) at 226:20-228:14. Second, Dr. Meyer assigns a new meaning to the term “non-pivotal” by claiming that the term allows for a small amount of pivotal motion, which goes directly against the meaning of the term in the context of the patent. CX-0006C at Q/A 87; RX-0990C at Q/A 45-47. At trial, Dr. Meyer could not provide any quantitative measure of “non-pivotal,” refusing to agree to any number that would be reasonably understood by a POSITA. Tr. (Meyer) at 225:14-226:19 (“I can’t give you a number. I don’t think that’s necessarily something that can be boiled down to a number.”). Finally, Dr. Meyer argues that even if “non-pivotal” actually means non-pivotal, the Accused Products meet this limitation because the two parts of the scraper blade are attached. CX-0006C at Q/A 88-89. Dr. Meyer fails to point to any structure that restricts pivotal motion between the two parts of the scraper blade, and also ignores the effect of machine clearances and tolerances between connection points on the machines. RX-0990C at Q/A 48-49; Tr. (Fronczak) at 554:3-13.

Caterpillar Br. at 59-60 (Caterpillar also cites RX-0990C (Fronczak RWS) at Q/A 39-41; Fronczak Tr. 554).

Wirtgen replies:

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Caterpillar's argument against infringement of the sliding non-pivotal motion limitation of claims 4 and 5 completely contradicts its own arguments on invalidity for this same limitation. Caterpillar alleges that a single drawing of the MP 1300 scraper blade provides clear and convincing evidence of sliding non-pivotal motion, yet somehow the equivalent drawings of the PM600 in combination with video documentation of the scraper blade moving and an expert's in-person inspection of a PM622 scraper blade in actual operation is somehow less than a preponderance of the evidence.

Dr. Meyer observed the PM622 in operation. CX-0006C (Meyer WS) Q85-86; Hearing Tr. 228:11-12 (Meyer). He observed the lower part of the scraper blade sliding nonpivotally, in tracks, relative to the upper portion. *Id.* All the photographs, videos, diagrams, and descriptions of the PM622 scraper blade are consistent with Dr. Meyer's assessment. Caterpillar's own witness, Mr. Engelmann, [

].
Hearing Tr. 719:6-720:5 (Engelmann). Caterpillar's suggestion that Dr. Meyer somehow needed to quantify and test the relative nonpivotal motion is belied by the claim language and its own expert's analysis.

Wirtgen Reply at 8-9.

Caterpillar's reply argues that Wirtgen is "attempt[ing] to blur the lines between the prior art and the Accused Products" and concludes that "[b]ecause Dr. Meyer failed to provide sufficient evidence to show that the scraper blade moves in a 'non-pivotal' fashion, Wirtgen has not proven that the Accused Products infringe claims 4 and 5." Caterpillar Reply at 5-6.

Having considered the parties' arguments, the administrative law judge has determined that the PM620 includes a two-part scraper blade behind the milling drum, where the lower part of the scraper blade can slide without pivoting relative to the upper part of the blade. It is undisputed that the PM620 includes a two-part scraper blade. *See* CX-0006 (Meyer WS) at Q/A 75-78; RX-0990C (Fronczak RWS) at Q/A 40. The lower part of the scraper blade is referred to as the "moldboard" and the upper part is the "rotor service door." CX-0006 (Meyer WS) at Q/A 78, 89. The evidence shows that the PM620's moldboard slides vertically in relation to the upper

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part of the scraper blade. *Id.* at Q/A 67, 85.⁶⁵ Wirtgen's brief cites to CPX-0039 and CPX-0040, which are videos of the moldboard moving vertically in relation to the rotor service door. *See* Wirtgen Br. at 44. These videos show that the moldboard moves "in a sliding non-pivotal motion" relative to the rotor service door. *See* CPX-0039; CPX-0040; CPX-0042; *see also* CX-0006 (Meyer WS) at Q/A 67 (explaining that Dr. Meyer took the videos). Accordingly, the administrative law judge has determined that the PM620 includes a two-part scraper blade behind the milling drum, where the lower part of the scraper blade can slide without pivoting relative to the upper part of the blade, as limitation 1[c] requires.

- e) ***1[d] a lifting actuator connected between the upper and lower parts to slide the lower part relative to the upper part between a downward extended position and an upward retracted position***

Wirtgen argues:

The PM620 infringes claim element 1[d]—it includes "a lifting actuator connected between the upper and lower parts to slide the lower part relative to the upper part between a downward extended position and an upward retracted position." CX-0006C Q90-91 (Meyer Opening WS); CX-0160 (Picture of PM620 scraper blade - 2); CX-0061C.0564 (PM620 Parts Manual). The PM620's scraper blade includes two cylinders that slide the moldboard relative to the rotor service door between a downward extended position and an upward retracted position, thereby hydraulically adjusting the height of the moldboard relative to the rotor service door. CX-0102C (PM620 Moldboard CAD); Hearing Tr. 718:16-24 (Engelmann); CDX-0002C.0014 (Meyer Direct Demonstrative).

Wirtgen Br. at 45.

⁶⁵ Dr. Meyer's citations to CX-0221 (PM620 Electronic System), CX-0115C (PM620 Rotor-2), CX-0059C (PM620 Operation and Maintenance Manual) are unhelpful. *See, e.g.,* CX-0006 (Meyer WS) at Q/A 81. CX-0221 is a CAD image of a caterpillar track and CX-0115C shows seven different CAD images of a milling drum. The moldboard and rotor service door are not shown in CX-0221 or CX-0115C. Dr. Meyer's generic reference to CX-0059C is not helpful because it does not contain a pinpoint citation (CX-0059C is several hundred pages).

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Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 58-61 (Caterpillar disputes limitation 1[c]); Caterpillar Reply at 5-6 (same).

The evidence shows that the PM620 includes piston-cylinder actuators that are connected to the rotor service door and moldboard and that the actuators slide the moldboard relative to the rotor service door between a lower and upper position. *See* CX-0006C (Meyer WS) at Q/A 90-94. Accordingly, the administrative law judge has determined that the PM620 includes a lifting actuator, connected between the upper and lower parts of the scraper door, that slide the lower part relative to the upper part, between a downward extended position and an upward retracted position, as limitation 1[d] requires.

f) 1[e] a swiveling actuator separate from the lifting actuator, the swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to extend to pivot the scraper blade upward about a swiveling axis parallel to and spaced apart from the milling drum axis.

Wirtgen argues:

The PM620 also includes a swiveling actuator as recited in element 1[e]. The rotor service door is pivotally mounted to the drum casing by pin joints. These pin joints define a swiveling axis that is parallel to the milling drum axis. The entire scraper blade, including both the moldboard and rotor service door, pivots about this swiveling axis. CX-0159 (Picture of PM620 scraper blade); CX-0153C (PM620 Systems Manual). The PM620's rotor service door cylinder, which is the claimed swiveling actuator, extends to pivot the scraper blade upward about a swiveling axis parallel to and spaced apart from the milling drum axis. CX-0068 (PM620 and PM622 Cold Planers Machine System); Hearing Tr. 720:6-721:8 (Engelmann). *See also* CDX-0002C.0008 (Meyer Direct Demonstrative). The PM620 lifting actuators and swiveling actuator are illustrated below.

[

– *Figure omitted* –

]

CX-0061C.0564 (Cold Planer PM620 Parts Manual) (annotated).

Wirtgen Br. at 45-46.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 58-61 (Caterpillar disputes limitation 1[c]); Caterpillar Reply at 5-6 (same).

The evidence shows that the PM620 includes a swiveling actuator, that is connected to the rotor service door and the machine frame, that can extend and pivot the scraper blade upward about an axis that is parallel to and spaced apart from the milling drum axis. *See* CX-0006C (Meyer WS) at Q/A 95-99; CPX-0083C (showing the scraper door pivoting). Accordingly, the administrative law judge has determined that the PM620 includes the swiveling actuator described in limitation 1[e]. Thus, based on the preceding analysis, the PM620 infringes claim 1.

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2. Claim 4

Claim 4 requires that “the swiveling actuator is pivotally connected to the upper part of the scraper blade at a pivotal connection having a pivotal axis lower in height than the swiveling axis.” JX-0001 at 7:6-9.

Wirtgen argues:

The PM620’s swiveling actuator is “pivotally connected to the upper part of the scraper blade at a pivotal connection having a pivotal axis lower in height than the swiveling axis,” as required by claim 4. CX-0591C.0236 (PM600 Technical Presentation). Specifically, the swiveling actuator pivotally connects to the rotor service door at a location lower in height than the scraper blade’s swiveling axis. CDX-0002C.0016 (Meyer Direct Demonstrative); CDX-002C.48 (Wirtgen W150CFi photo 1, annotated); CX-0247 (Wirtgen W150CFi photo 1)[.]

Wirtgen Br. at 46.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 58-61 (Caterpillar disputes limitation 1[c]); Caterpillar Reply at 5-6 (same).

The evidence shows that the swiveling actuator in the PM620 is connected to the upper part of the scraper blade (in a manner that allows for pivoting) and that the scraper blade’s pivoting axis is lower than the scraper blade’s swiveling axis. *See* CX-0006C (Meyer WS) at Q/A 100-106; CDX-0002 (Meyer Demonstratives) at 16. Dr. Meyer provided the following annotated figure of the PM620:

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[

– Figure omitted –

]

CDX-0002 (Meyer Demonstratives) at 16. In Q/A 101, Dr. Meyer explained:

101. I have put up CDX-0002C.16 (Meyer Direct Demonstrative). What at is your analysis shown here?

A. As can be seen from the image on CDX-0002C.16 (Meyer Direct Demonstrative), the location where the swiveling actuator that is connected to the upper part of the scraper blade—which is circled in red—is lower in height than the swiveling axis of the scraper blade—which is indicated by the blue line.

CX-0006C (Meyer WS) at Q/A 101. Based on the above, the administrative law judge has determined that the PM620's swiveling actuator is situated as described in claim 4. Accordingly, the PM620 infringes claim 4.

3. Claim 5

Claim 5 requires that the swiveling axis from claims 1 and 4 “is offset rearward from the pivotal axis of the pivotal connection relative to the direction of travel.” JX-0001 at 7:10-13.

Wirtgen's entire argument is:

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The PM620 infringes claim 5 because the scraper blade's swiveling axis "is offset rearward from the pivotal axis of the pivotal connection relative to the direction of travel." CX-0006C Q107 (Meyer Opening WS); CX-0153C (PM620 Systems Manual); CPX-0118C (PM620 CAD). The claim does not require that the offset remain in effect at all points in time. Indeed, the PM620 swiveling axis is offset rearward from the pivotal axis most of the time, including during milling operations. CX-0006C Q115-16 (Meyer Opening WS); Hearing Tr. 720:13-721:4 (Engelmann) ([

]). That arrangement satisfies the limitations of claim 5. *See also* CDX-0002C.0019 (Meyer Direct Demonstrative); CPX-0118C (PM620 CAD) (showing the relative positions of the pivotal connection and the swiveling axis). Caterpillar's expert offered no opinion to the contrary.

Wirtgen Br. at 46-47.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 58-61 (Caterpillar disputes limitation 1[c]); Caterpillar Reply at 5-6 (same).

The evidence shows that the PM620 scraper blade's swiveling axis is behind the pivotal axis of the pivotal connection relative to the direction of travel. *See* CX-0006C (Meyer WS) at Q/A 107-109. Dr. Meyer provided the following annotated figures of the PM620:

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[

– Figure omitted –

]

CDX-0002C (Meyer Demonstratives) at 19. In Q/A 108, Dr. Meyer explained:

108. I have put up CDX-0002C.19 (Meyer Direct Demonstrative). What at is your analysis shown here?

A. As can be seen from the images on CDX-0002C.19 (Meyer Direct Demonstrative), the swiveling axis of the scraper blade—which is indicated by the blue lines and blue circles—is offset rearward from the location where the swiveling actuator that is connected to the upper part of the scraper blade—which is circled in red.

CX-0006C (Meyer WS) at Q/A 108. Based on the above, the administrative law judge has determined that the PM620's swiveling axis "is offset rearward from the pivotal axis of the pivotal connection relative to the direction of travel." Accordingly, the PM620 infringes claim 5.

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4. Claim 9

For its infringement analysis, Wirtgen divides claim 9 into nine limitations, as follows:

9[p] 9. A construction machine, comprising:

9[a] a machine frame;

9[b] a milling drum mounted to rotate about a milling drum axis, the milling drum axis being fixed relative to the machine frame;

9[c] a scraper blade located behind the milling drum with reference to a direction of travel of the construction machine, the scraper blade including an upper part and a lower part;

9[d] a lifting actuator connected between the upper and lower parts to move the lower part relative to the upper part between a downward extended position and an upward retracted position; and

9[e] a swiveling actuator separate from the lifting actuator, the swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to pivot the scraper blade between an operating position and a raised position about a swiveling axis parallel to and spaced apart from the milling drum axis;

wherein:

9[f] the swiveling actuator is connected to the fixed part at a machine side pivotal connection;

9[g] the swiveling actuator is connected to the scraper blade at a blade side pivotal connection, a pivotal axis of the blade side pivotal connection being lower in height than the swiveling axis; and

9[h] the swiveling axis is offset rearward from the pivotal axis of the blade side pivotal connection when the scraper blade is in the operating position.

See CDX-0002 (Meyer Demonstratives) at 21-32; CX-0006C (Meyer WS) at Q/A 118-133.

Caterpillar's entire non-infringement argument for claims 9 and 12 follows:

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Claims 9 and 12 require a “swiveling actuator being configured to pivot the scraper blade between an operating position and a raised position.” The parties dispute the construction of the term “operating position,” as explained in the claim construction briefing in this Investigation. Under the correct construction of “operating position,” Wirtgen has failed to show this limitation is met by the Accused Products.

The PM600 and PM800 series machines do not pivot the scraper blade between the operating position and the raised position—where the scraper blade has been pivoted upward. RX-0990C at Q/A 58. Instead, the PM600 and PM800 series machines must first raise the lower part of the scraper blade up above the locking mechanism into an intermediate position. *Id.* Indeed, in order to be able to operate, the scraper blade on the Accused Products must remain locked into the lateral retaining walls—[

].

RX-0157C.0202 (PM600 STMG).

Dr. Meyer’s argument that the Accused Products infringe under Caterpillar’s construction of “operating position” is unfounded. Dr. Meyer argues that the scraper blade can be raised to a particular orientation to “windrow,” or operate while allowing milled road to escape behind the machine. CX-0006C at Q/A 127. However, as previously explained, once the scraper blade on the Accused Products is sufficiently raised to be able to pivot, it is unlocked from the lateral retaining devices; in this position, the milling drum is physically unable to “operate” at all. RX-0990C at Q/A 58-61. Thus, under Caterpillar’s construction, the PM620 does not infringe.

Caterpillar Br. at 60-61. Caterpillar’s Reply likewise focuses on limitation 9[e]. *See* Caterpillar Reply at 6-7.

a) Limitations 9[p]-9[d]

Wirtgen argues, in part that “Independent claim 9 mirrors claim 1’s preamble and first four elements. The analysis above for claim 1 therefore applies equally to these elements of claim 9.” Wirtgen Br. at 47.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 58-61 (Caterpillar disputes limitation 9[e]); Caterpillar Reply at 6-7 (same).

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The evidence shows that limitations 9[p]-9[d] read on the PM620 for the same reasons that limitations 1[p]-1[d] read on the PM620. Dr. Meyer testified as follows:

118. Q. Looking next at claim 9, what is your opinion as to whether the PM620 machine practices claim elements 9[p]-9[d]?

A. The PM620 machine practices claim elements 9[p]-9[d] for the same reasons that I discussed earlier with respect to claim element 1[p]-1[d], respectively. CDX-0002C.21-25 (Meyer Direct Demonstrative).

CX-0006 (Meyer WS) at Q/A 118. Neither Caterpillar nor Dr. Fronczak rebut this testimony.

See generally RX-0990C (Fronczak RWS) at Q/A 53-61. Accordingly, the administrative law judge has determined that the PM620 includes the components described in limitations 9[p]-9[d].

b) Limitation 9[e]

Limitation 9[e] follows:

9[e] a swiveling actuator separate from the lifting actuator, the swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to pivot the scraper blade between an operating position and a raised position about a swiveling axis parallel to and spaced apart from the milling drum axis;

JX-0001 at 7:38-45.

Wirtgen argues:

The PM620 further includes “a swiveling actuator separate from the lifting actuator, the swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to pivot the scraper blade between an operating position and a raised position about a swiveling axis parallel to and spaced apart from the milling drum axis” as recited in element 9[e]. CX-0159 (Picture of PM620 scraper blade). The PM620’s swiveling actuator is a separate structure from the lifting actuator. CX-0006C Q120 (Meyer Opening WS). One end of the swiveling actuator connects to the rotor service door, and the other end connects to the drum casing. CX-0006C Q122 (Meyer Opening WS); CDX-0002C.0026-27 (Meyer Direct Demonstrative).

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The parties dispute the proper construction of the term operating position that appears in claim 9[e], although the PM620 infringes under either party's construction. CX-0006C Q124 (Meyer Opening WS). The PM620's scraper blade, including both the moldboard and the rotor service door, pivots from a first, substantially downward orientation, to a second raised orientation. CX-0153C (PM620 Systems Manual); Hearing Tr. 717:21-721:8. Pivoting occurs after the moldboard slides upward relative to the rotor service door. *Id.* Nevertheless, the scraper blade, as a whole, remains in the first orientation—angled substantially downward—that corresponds to the angular position during milling operation. CX-0006C Q125 (Meyer Opening WS). Although not at a perfectly vertical angular position, this first orientation still allows milling operations to be performed, which meets Caterpillar's proposed construction for the term "operating position." CX-0006C Q126 (Meyer Opening WS). For example, in practice, the scraper blade can be placed at this orientation when it is desirable to windrow, *i.e.*, allow the milled material to escape out the back of the drum housing and deposited behind the machine. CX-0006C Q127 (Meyer Opening WS).

Wirtgen Br. at 47-48.

As noted above, Caterpillar argues that it does not infringe because the scraper blade stops at an intermediate position between the operating position and the raised position. *See* Caterpillar Br. at 64-65; *see also* Caterpillar Reply at 6-7 ("Caterpillar's construction requires the scraper blade to be in a position that allows for milling operation. . . . When the Accused Products and the alleged DI products are milling, the scraper blade must remain locked into the lateral retaining devices, meaning that the scraper blade cannot pivot from the operating position to the raised position.").

The evidence shows that the PM620 includes separate lifting and swiveling actuators and that the swiveling actuator is connected to the rotor service door and the PM620 frame. The swiveling actuator is configured to pivot the scraper blade between an operating position (*e.g.*, a substantially vertical position) and a raised position. In moving the scraper blade between these positions, the scraper blade moves about a swiveling axis that is parallel to, and spaced apart

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from, the milling drum's axis. *See* CX-0006C at Q/A 119-128.⁶⁶ Accordingly, the administrative law judge has determined that the PM620 includes the swiveling actuator described in limitation 9[e].

c) Limitation 9[f]

Limitation 9[f] requires that “the swiveling actuator is connected to the fixed part at a machine side pivotal connection[.]” JX-0001 at 8:2-3.

Wirtgen argues that the PM620 “includes a swiveling actuator that is ‘connected to the fixed part at a machine side pivotal connection’ as recited in element 9[f]. The PM620 includes a swiveling actuator connected to the drum casing at a fixed location.” Wirtgen Br. at 48. Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 58-61 (Caterpillar disputes limitation 1[c]); Caterpillar Reply at 5-6 (same).

The evidence shows that the PM620 includes a swiveling actuator that is connected at a fixed location on the drum casing. CX-0006C (Meyer WS) at Q/A 129-30. Accordingly, the administrative law judge has determined that the PM620's swiveling actuator is connected to the fixed part at a machine side pivotal connection, as limitation 9[f] requires.

d) Limitations 9[g] and 9[h]

Wirtgen argues:

The PM620 includes a swiveling actuator that is “connected to the fixed part at a machine side pivotal connection” as recited in element 9[f]. The PM620 includes a swiveling actuator connected to the drum casing at a fixed location. CX-0006C Q130 (Meyer Opening WS). Elements 9[g] and 9[h] mirror the language of dependent claims 4 and 5, discussed above. The PM620 therefore satisfies those limitations for the same reasons that it practices claim 4 and 5. The PM620 therefore satisfies every element of claim 9.

⁶⁶ The PM620 also infringes under Caterpillar's proposed construction for “operating position.” *See* CX-0006C (Meyer WS) at Q/A 124, 126-27.

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Wirtgen Br. at 48.

Caterpillar does not clearly rebut these arguments. *See generally* Caterpillar Br. at 58-61 (Caterpillar disputes limitation 9[e]); Caterpillar Reply at 6-7 (same).

The evidence shows that limitations 9[g] and 9[h] read on the PM620 for the same reasons that claims 4 and 5 read on the PM620. CX-0006 (Meyer WS) at Q/A 131. Neither Caterpillar nor Dr. Fronczak rebut this testimony. *See generally* RX-0990C (Fronczak RWS) at Q/A 53-61. Accordingly, the administrative law judge has determined that the PM620 includes the components described in limitations 9[g] and 9[h]. Thus, based on the preceding analysis, the PM620 infringes claim 9.

5. Claim 12

Claim 12 requires that the “pivotal axis of the machine side pivotal connection is located forward of the pivotal axis of the blade side pivotal connection.” JX-0001 at 8:16-19.

Wirtgen’s entire argument is:

The PM620 includes a swiveling actuator that has “a pivotal axis of the machine side pivotal connection [that] is located forward of the pivotal axis of the blade side pivotal connection” as recited in claim 12. The swiveling actuator connects to the drum casing at a location forward of where it connects to the rotor service door. CPX-0118C (PM620 CAD); CDX002C.0034 (Meyer Direct Demonstrative); Hearing Tr. 720:3-721:4.

Wirtgen Br. at 48-49.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 58-61 (Caterpillar disputes limitation 9[e], not claim 12); Caterpillar Reply at 6-7 (same).

The evidence shows that the PM620’s swiveling actuator connects “to the drum casing of the machine is located forward of the location where swiveling actuator is connected to the rotor

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service door.” CX-0006C (Meyer WS) at Q/A 134-35. Dr. Meyer included the following demonstrative:

[

– Figure omitted –

]

CDX-0002C (Meyer Demonstratives) at 34; *see also* CX-0006C (Meyer WS) at Q/A 135 (“the bottom image similarly shows that the location where the swiveling actuator that is connected to the machine—which is circled in red—is located forward of the location where swiveling actuator is connected to the scraper blade—which is indicated by the blue circle.”). Accordingly, the administrative law judge has determined that the PM620 infringes claim 12.

D. Domestic Industry – Technical Prong

Wirtgen argues that its W150CFi and W210i machines practice claims 1, 4, 5, 9, and 12.

See Wirtgen Br. at 49-53.

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In general, Caterpillar argues that Wirtgen's machines do not practice the asserted claims based on the same reasoning Caterpillar presents in arguing that the PM620 does not infringe the asserted claims. *See* Caterpillar Br. at 63-65 (contesting "the 'non-pivotal' limitation, required by claims 4 and 5" and the "operating position" limitation (*i.e.*, "swiveling actuator being configured to pivot the scraper blade between an operating position and a raised position") of claim 9); *see also* Caterpillar Reply at 5-7 (same).

1. Claim 1

a) 1[p] 1. A construction machine

Wirtgen argues that "the W210i and W150CFi are each construction machines as recited in the preamble." Wirtgen Br. at 49.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 63-64 (Caterpillar disputes limitation 1[c]); Caterpillar Reply at 5-6 (same).

The evidence shows that the W210i and W150CFi are construction machines. *See* CX-0006C (Meyer WS) at Q/A 150-52. Accordingly, the administrative law judge has determined that the W210i and W150CFi are construction machines, as the preamble requires.

b) 1[a] a machine frame

Wirtgen argues that the W210i and W150CFi each has a machine frame. *See* Wirtgen Br. at 49.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 63-64 (Caterpillar disputes limitation 1[c]); Caterpillar Reply at 5-6 (same).

The evidence shows that the W210i and W150CFi each has a machine frame. *See* CX-0006C (Meyer WS) at Q/A 153. Accordingly, the administrative law judge has determined that the W210i and W150CFi each has a machine frame, as limitation 1[a] requires.

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- c) ***1[b] a milling drum mounted to rotate about a milling drum axis, the milling drum axis being fixed relative to the machine frame***

Wirtgen argues that the W210i and W150CFi each has “a milling drum mounted to rotate about a milling drum axis, the milling drum axis being fixed relative to the machine frame” as recited in element 1[b].” Wirtgen Br. at 49.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 63-64 (Caterpillar disputes limitation 1[c]); Caterpillar Reply at 5-6 (same).

The evidence shows that the W210i and W150CFi each has a milling drum that can rotate about its axis, which is fixed relative to the machine frame. *See* CX-0006C (Meyer WS) at Q/A 154-57. Accordingly, the administrative law judge has determined that the W210i and W150CFi each has a milling drum that can rotate about its axis, which is fixed relative to the machine frame, as limitation 1[b] requires.

- d) ***1[c] a scraper blade located behind the milling drum with reference to a direction of travel of the construction machine, the scraper blade including an upper part and a lower part, the lower part being movable in a sliding non-pivotal motion relative to the upper part***

Wirtgen argues:

The W210i and W150CFi include “a scraper blade located behind the milling drum with reference to a direction of travel of the construction machine, the scraper blade including an upper part and a lower part, the lower part being movable in a sliding non-pivotal motion relative to the upper part” as recited in element 1[c]. CX-0202C.0038 (Representative DI Photos); CX-0010C (Allen WS) Q58. Both machines have a two-part scraper blade in which the lower part slides vertically relative to the upper part. CX-0204C.0021 (Representative DI Photos - 4); CX-0010C (Allen WS) Q59. The lifting actuators prevent the lower part of the scraper blade from pivoting relative to the upper part. CX-0006C Q164 (Meyer Opening WS); CX-0202C.0031 (Representative DI Photos). The motion of the lower part of the scraper blade is non-pivotal relative to the upper part because the lower part slides without any meaningful pivotal motion. CPX-0093C (W210i Video Scraper

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Raising & Lowering); CPX-0069C (W210i Moldboard raise, lower video); CPX-0106C (W150CFi moldboard raise); CPX-0107C (W150CFi moldboard raise, lower); CPX-0094C (W210i Video Swiveling Actuator Extending); CPX-0088C (W150CFi Video Scraper Raising & Lowering); CX-0006C Q169-70 (Meyer Opening WS); CDX-0002C.0041, .0043 (Meyer Demonstrative); CX-0010C (Allen WS) Q59.

Wirtgen Br. at 49-50.

Caterpillar argues:

As with the infringement analysis, none of Wirtgen's evidence proves that the sliding motion of the lower part of the scraper blade is non-pivotal. RX-0990C (Fronczak Rebuttal Witness Statement) at Q/A 89. Dr. Meyer claims that the lifting actuators connecting the upper and lower part of the scraper blade provide a "structure" that prevents pivotal motion. CX-0006C at Q/A 164. This is incorrect. The lifting actuators are connected to the scraper blade using pin-joints. *See* RDX-0008C.22. Pin joints are pivotal connections that permit free pivotal motion without additional retaining devices. RX-0990C at Q/A 92; RX-1169C (Wirtgen W210i Photo). Thus, they cannot support Wirtgen's argument for a "non-pivotal" motion.

Caterpillar Br. at 63-64.

Wirtgen replies that Caterpillar's "arguments are flawed and fail for the same reasons discussed above [for infringement]." Wirtgen Reply at 10.

Caterpillar replies:

Similarly, Wirtgen's post-hearing brief continues the same domestic industry mistakes that have persisted throughout the Investigation and have been disproven by the evidence. Wirtgen continues to argue that "lifting actuators prevent the lower part of the scraper blade from pivoting relative to the upper part," and that this makes the alleged DI products "non-pivotal." Wirtgen PostHBr. at 49. Dr. Fronczak's analysis squarely rebuts this allegation. Indeed, Wirtgen has never disputed Dr. Fronczak's explanation that the "lifting actuators" in the Wirtgen machines are connected by pin joints that permit free pivotal motion—failing to provide the structure that would create a "non-pivotal" sliding motion. RX-0990C (Fronczak Rebuttal Witness Statement) at Q/A 92. Therefore, Wirtgen has failed to prove that its alleged DI products practice claims 4 and 5.

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Caterpillar Reply at 6.

Having considered the parties' arguments, the administrative law judge has determined that the W210i and W150CFi each has a two-part scraper blade behind the milling drum, where the lower part of the scraper blade can slide (vertically) without pivoting relative to the upper part of the blade. *See* CX-0006 (Meyer WS) at Q/A 158-70; *see also* CPX-0093C (W210i Video Scraper Raising & Lowering); CPX-0069C (W210i Moldboard raise, lower video); CPX-0106C (W150CFi moldboard raise); CPX-0107C (W150CFi moldboard raise, lower); CPX-0094C (W210i Video Swiveling Actuator Extending); CPX-0088C (W150CFi Video Scraper Raising & Lowering). In particular, the videos show that the moldboard moves "in a sliding non-pivotal motion" relative to the rotor service door. *See id.* Accordingly, the administrative law judge has determined that the W210i and W150CFi each has a two-part scraper blade behind the milling drum, where the lower part of the scraper blade can slide without pivoting relative to the upper part of the blade, as limitation 1[c] requires.

- e) ***1[d] a lifting actuator connected between the upper and lower parts to slide the lower part relative to the upper part between a downward extended position and an upward retracted position***

Wirtgen argues:

The W210i and W150CFi include "a lifting actuator connected between the upper and lower parts to slide the lower part relative to the upper part between a downward extended position and an upward retracted position" as recited in element 1[d]. CX-0247; CX-0202C.0039 (Representative DI Photos). The W210i and W150CFi each have two lifting actuators, both connected between the upper and lower parts of the scraper blade. CX-0006C Q172-73 (Meyer Opening WS); CDX0002C.0044, .0200 (Meyer Direct Demonstrative); CX-0010C (Allen WS) Q59.

Wirtgen Br. at 50.

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Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 63-64 (Caterpillar disputes limitation 1[c]); Caterpillar Reply at 5-6 (same).

The evidence shows that the W210i and W150CFi each has lifting actuators that are connected to the upper and lower parts and that the actuators slide the lower part relative to the upper part between a lower and upper position. *See* CX-0006C (Meyer WS) at Q/A 171-73. Accordingly, the administrative law judge has determined that the W210i and W150CFi each has a lifting actuator, connected between the upper and lower parts of the scraper door, that slide the lower part relative to the upper part, between a downward extended position and an upward retracted position, as limitation 1[d] requires.

- f) 1[e] a swiveling actuator separate from the lifting actuator, the swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to extend to pivot the scraper blade upward about a swiveling axis parallel to and spaced apart from the milling drum axis.*

Wirtgen argues:

The W210i and W150CFi include “a swiveling actuator separate from the lifting actuator, the swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to extend to pivot the scraper blade upward about a swiveling axis parallel to and spaced apart from the milling drum axis” as recited in element 1[e]. CX-0006C Q175-76 (Meyer Opening WS); CX-0010C (Allen WS) Q60; CPX-0093C (W210i Video Scraper Raising & Lowering); CPX-0069C (W210i Moldboard raise, lower video); CPX-0106C (W150CFi moldboard raise); CPX-0107C (W150CFi moldboard raise, lower); CPX-0094C (W210i Video Swiveling Actuator Extending); CPX-0088C (W210i Video Swiveling Actuator Extending).

Wirtgen Br. at 50.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 63-64 (Caterpillar disputes limitation 1[c]); Caterpillar Reply at 5-6 (same).

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The evidence shows that the W210i and W150CFi each has a swiveling actuator, that is connected to the upper part of the scraper blade and the machine frame, that can extend and pivot the scraper blade upward about an axis that is parallel to and spaced apart from the milling drum axis. *See* CX-0006C (Meyer WS) at Q/A 174-78; CPX-0093C (W210i Video Scraper Raising & Lowering); CPX-0069C (W210i Moldboard raise, lower video); CPX-0106C (W150CFi moldboard raise); CPX-0107C (W150CFi moldboard raise, lower); CPX-0094C (W210i Video Swiveling Actuator Extending); CPX-0088C (W210i Video Swiveling Actuator Extending). Accordingly, the administrative law judge has determined that the W210i and W150CFi each has the swiveling actuator described in limitation 1[e]. Thus, based on the preceding analysis, the W210i and W150CFi practice claim 1.

2. Claim 4

Claim 4 requires that “the swiveling actuator is pivotally connected to the upper part of the scraper blade at a pivotal connection having a pivotal axis lower in height than the swiveling axis.” JX-0001 at 7:6-9.

Wirtgen argues:

The W210i and W150CFi practice claim 4 because they also include a swiveling actuator that is “pivotally connected to the upper part of the scraper blade at a pivotal connection having a pivotal axis lower in height than the swiveling axis.” CX-0202C.0021 (Representative DI Photos); CX-0247 (Wirtgen W150CFi photo); CX-0010C (Allen WS) Q60. On both machines, the swiveling actuator connects to the upper part of the scraper blade at a location lower in height than the swiveling axis of the scraper blade. CX-0006C Q180, 183 (Meyer Opening WS); CX-0247; CDX-0002C.0047-48 (Meyer Direct Demonstrative); CX-0010C (Allen WS) Q60.

Wirtgen Br. at 51.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 63-64 (Caterpillar disputes limitation 1[c]); Caterpillar Reply at 5-6 (same).

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The evidence shows that the swiveling actuator in the W210i is connected to the upper part of the scraper blade (in a manner that allows for pivoting) and that the scraper blade's pivoting axis is lower than the scraper blade's swiveling axis. The same is true for the W150CFi. *See* CX-0006C (Meyer WS) at Q/A 179-86. Accordingly, the administrative law judge has determined that the swiveling actuators in the W210i and W150CFi are situated as described in claim 4. Thus, the W210i and W150CFi practice claim 4.

3. Claim 5

Claim 5 requires that the swiveling axis from claims 1 and 4 "is offset rearward from the pivotal axis of the pivotal connection relative to the direction of travel." JX-0001 at 7:10-13.

Wirtgen argues:

The W210i and W150CFi further practice claim 5, which depends from claim 4, because the swiveling axis of the scraper blade on the W210i and W150CFi "is offset rearward from the pivotal axis of the pivotal connection relative to the direction of travel." CX-0006C Q188-89 (Meyer Opening WS); CX-0247 (W150CFi pivotable actuator); CX-0290 (Wirtgen W150CFi photo 2); CDX-0002C.0050-51 (Meyer Direct Demonstrative); CX-0010C (Allen WS) Q60. Caterpillar does not dispute the offset, as shown in the photographs Wirtgen America references. Instead, Caterpillar argues that the swiveling axis might not be offset rearward from the pivotal axis in all positions of the scraper blade. But claim 5 does not require that the swiveling axis be offset rearward in all positions of the scraper blade, and the technical prong does not require that that a domestic-industry product practice the invention at all points in time.

Wirtgen Br. at 51.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 63-64 (Caterpillar disputes limitation 1[c]); Caterpillar Reply at 5-6 (same).

The evidence shows that the W210i scraper blade's swiveling axis is behind the pivotal axis of the pivotal connection relative to the direction of travel. The same is true for the

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W150CFi. *See* CX-0006C (Meyer WS) at Q/A 187-98. Accordingly, the administrative law judge has determined that the W210i and W150CFi each has a swiveling axis that “is offset rearward from the pivotal axis of the pivotal connection relative to the direction of travel.” Thus, the W210i and W150CFi practice claim 5.

4. Claim 9

Caterpillar’s entire argument for claims 9 and 12 follows:

Claims 9 and 12 require a “swiveling actuator being configured to pivot the scraper blade between an operating position and a raised position.” Under the correct construction of “operating position,” Wirtgen has failed to show this limitation is satisfied by any of the alleged DI products. As previously explained, the correct construction of “operating position” requires the scraper blade to be in a position where the machine can operate to mill ground surfaces. RX-0990C at Q/A 103. The Wirtgen machines, like the Accused Products, require the scraper blade to be engaged with the lateral retaining devices in order to operate. *See* RPX-0007C (W210i Inspection Video); RX-0179.0133 (W210i Instruction Manual); RX-0990C at Q/A 106. Similarly, the Wirtgen machines cannot pivot the scraper blade from the operating position to the raised position, because the scraper blade must first unlock from the lateral retaining devices to be able to pivot. RPX-0007C (W210i Inspection Video); RX-0179.0133 (W210i Instruction Manual). None of the evidence cited by Wirtgen or Dr. Meyer shows anything to the contrary. RX-0990C at Q/A 112. Thus, Wirtgen has failed to show that this limitation is satisfied.

Caterpillar Br. at 64-65. Caterpillar’s Reply likewise focuses on limitation 9[e]. *See* Caterpillar Reply at 6-7.

a) *Limitations 9[p]-9[d]*

Wirtgen argues, in part that “Because independent claim 9 mirrors claim 1 for the preamble and first four elements, the claim 1 analysis above also applies to these elements as recited in claim 9.” Wirtgen Br. at 51.

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Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 64-65 (Caterpillar disputes limitation 9[e]); Caterpillar Reply at 6-7 (same).

The evidence shows that limitations 9[p]-9[d] read on the W210i and W150CFi for the same reasons that limitations 1[p]-1[d] read on the W210i and W150CFi. CX-0006 (Meyer WS) at Q/A 199. Neither Caterpillar nor Dr. Fronczak rebut this testimony. *See generally* RX-0990C (Fronczak RWS) at Q/A 101-15. Accordingly, the administrative law judge has determined that the W210i and W150CFi each has the components described in limitations 9[p]-9[d].

b) Limitation 9[e]

Limitation 9[e] follows:

9[e] a swiveling actuator separate from the lifting actuator, the swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to pivot the scraper blade between an operating position and a raised position about a swiveling axis parallel to and spaced apart from the milling drum axis;

JX-0001 at 7:38-45.

Wirtgen argues:

The W210i and W150CFi further include “a swiveling actuator separate from the lifting actuator, the swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to pivot the scraper blade between an operating position and a raised position about a swiveling axis parallel to and spaced apart from the milling drum axis” as recited in element 9[e]. CDX-0002C.0063-64 (Meyer Direct Demonstrative); CX-0010C (Allen WS) Q60. The swiveling actuator in the W210i and W150CFi is a separate structure from the lifting actuator. CX-0006C Q200-201 (Meyer Opening WS). The swiveling actuator connects at one end to the upper part of the scraper blade and at the other end to the drum casing. CX-0006C Q202 (Meyer Opening WS).

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The parties dispute the proper construction of the term operating position that appears in claim 9[e], although the W210i and W150CFi practice this limitation under either party's construction. CX-0006C Q203 (Meyer Opening WS). The scraper blades of the W210i and W150CFi pivot from a first, substantially downward orientation, to a second raised orientation. CX-0006C Q204-205 (Meyer Opening WS). Pivoting occurs after the lower part slides upward relative to the upper part. *Id.* Nevertheless, the scraper blade, as a whole, remains in the first orientation—angled substantially downward—that corresponds to the angular position during milling operation. CX-0006C Q204-205 (Meyer Opening WS). Although not at a perfectly vertical angular position, this first orientation still allows milling operations to be performed, which meets Caterpillar's proposed construction for the term "operating position." CX-0006C Q205 (Meyer Opening WS). The swiveling actuator on both machines extends to pivot the scraper blade between an operating position and a raised position about a swiveling axis parallel to and spaced apart from the milling drum axis when a raise command is initiated CPX-0093C (W210i Video Scraper Raising & Lowering); CPX-0069C (W210i Moldboard raise, lower video); CPX-0106C (W150CFi moldboard raise); CPX-0107C (W150CFi moldboard raise, lower); CPX-0094C (W210i Video Swiveling Actuator Extending); and CPX-0088C (W210i Video Swiveling Actuator Extending).

Wirtgen Br. at 51-53.

As noted above, and in an analogous argument it presented for its non-infringement arguments, Caterpillar argues that the Wirtgen machines do not practice claim 9 because "the Wirtgen machines cannot pivot the scraper blade from the operating position to the raised position, because the scraper blade must first unlock from the lateral retaining devices to be able to pivot." *See* Caterpillar Br. at 65; *see also* Caterpillar Reply at 6-7 ("Caterpillar's construction requires the scraper blade to be in a position that allows for milling operation. . . . When the Accused Products and the alleged DI products are milling, the scraper blade must remain locked into the lateral retaining devices, meaning that the scraper blade cannot pivot from the operating position to the raised position.").

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The evidence shows that the W210i and W150CFi each has separate lifting and swiveling actuators and that the swiveling actuator is connected to the upper part of the scraper blade and the machine frame.

The swiveling actuator is configured to pivot the scraper blade between an operating position (*e.g.*, a substantially vertical position) and a raised position. In moving the scraper blade between these positions, the scraper blade moves about a swiveling axis that is parallel to, and spaced apart from, the milling drum's axis. *See* CX-0006C at Q/A 200-06.⁶⁷ Accordingly, the administrative law judge has determined that the W210i and W150CFi each has the swiveling actuator described in limitation 9[e].

c) Limitation 9[f]

Limitation 9[f] requires that “the swiveling actuator is connected to the fixed part at a machine side pivotal connection[.]” JX-0001 at 8:2-3.

Wirtgen argues:

The W210i and W150CFi machines include a swiveling actuator that is “connected to the fixed part at a machine side pivotal connection” as recited in element 9[f]. Both machines include a swiveling actuator connected to the drum casing at a fixed location. CX-0006C Q208-209 (Meyer Opening WS).

Wirtgen Br. at 53.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 64-65 (Caterpillar disputes limitation 1[c]); Caterpillar Reply at 5-6 (same).

The evidence shows that the W210i and W150CFi each has a swiveling actuator that is connected at a fixed location on the drum casing. CX-0006C (Meyer WS) at Q/A 207-09.

⁶⁷ The Wirtgen machines also practice claim 9 under Caterpillar's proposed construction for “operating position.” *See* CX-0006C (Meyer WS) at Q/A 205.

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Accordingly, the administrative law judge has determined that the W210i's swiveling actuator is connected to the fixed part at a machine side pivotal connection, as limitation 9[f] requires. The same is true for the W150CFi.

d) Limitations 9[g] and 9[h]

Wirtgen argues:

Elements 9[g] and 9[h] mirror the language of dependent claims 4 and 5, discussed above. The W210i and W150CFi machines therefore satisfy those limitations for the same reasons that they practice claims 4 and 5. The W210i and W150CFi therefore satisfy every element of claim 9. CX-0006C Q210 (Meyer Opening WS).

Wirtgen Br. at 53.

Caterpillar does not clearly rebut these arguments. *See generally* Caterpillar Br. at 64-65 (Caterpillar disputes limitation 9[e]); Caterpillar Reply at 6-7 (same).

The evidence shows that limitations 9[g] and 9[h] read on the W210i and W150CFi for the same reasons that claims 4 and 5 read on the W210i and W150CFi. CX-0006 (Meyer WS) at Q/A 210. Neither Caterpillar nor Dr. Fronczak rebut this testimony. *See generally* RX-0990C (Fronczak RWS) at Q/A 101-115. Accordingly, the administrative law judge has determined that the W210i and W150CFi each has the components described in limitations 9[g] and 9[h]. Thus, based on the preceding analysis, the W210i and W150CFi practice claim 9.

5. Claim 12

Claim 12 requires that the "pivotal axis of the machine side pivotal connection is located forward of the pivotal axis of the blade side pivotal connection." JX-0001 at 8:16-19.

Wirtgen's entire argument is:

Claim 12 depends from claim 9. The W210i and W150CFi include a swiveling actuator that has "a pivotal axis of the machine side pivotal connection [that] is located forward of the pivotal axis of the blade side pivotal connection" as further recited in claim 12. The

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swiveling actuator's connects to the drum casing at a location forward of its connection to the upper part of the scraper blade. CX-0006C Q214-15 (Meyer Opening WS); CDX0002C.0072-73 (Meyer Direct Demonstrative); CX-0010C (Allen WS) Q60.

Wirtgen Br. at 63.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 64-65 (Caterpillar disputes limitation 9[e], not claim 12); Caterpillar Reply at 6-7 (same).

The evidence shows that the W210i and W150CFi each has a swiveling actuator that connects "to the drum casing of the machine frame of the W210i [and W150CFi] machine is located forward of the location where swiveling actuator is connected to the upper part of the scraper blade." *See* CX-0006C (Meyer WS) at Q/A 213-17. Accordingly, the administrative law judge has determined that the W210i and W150CFi practice claim 12.

E. Obviousness – Marini MP 1300

Caterpillar argues that the Marini MP 1300 anticipates claim 1 and "renders obvious each of asserted claims 4, 5, 9, and 12, either by itself or in combination with other references." Caterpillar Br. at 37, 43 ("base claim 1 is anticipated by the MP 1300").

1. Whether the MP 1300 Is Prior Art

Caterpillar argues that the MP 1300 is prior art under 35 U.S.C. § 102(b). Caterpillar Br. at 37-38. Caterpillar relies on Dr. Fronczak's witness statement (RX-0984C (Fronczak WS) at Q/A 67-69), RX-1167C (Supplemental BOMAG Invoices); RX-0125 (MP 1000/1300 Advertisement), and Dr. Fronczak's testimony (Fronczak Tr. 549), and Marini operation and maintenance manual and spare parts books that were in Caterpillar's possession (*e.g.*, RX-0005 (MP1300 OMM) and RX-0006 (MP1300 Parts)). *Id.*

Wirtgen argues that Caterpillar's evidence does not establish that the MP1300 was sold prior to the critical date, which is August 15, 2006. Wirtgen Br. at 54.

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In reply, Caterpillar argues that the sales invoices are presumed authentic. Caterpillar Br. at 11. Caterpillar also argues that the MP 1300 Parts Manual, RX-0006, has a printed date of June 2006. *Id.* (the Parts Manual, has a printed date of "Giugno, 2006," which is June). Having considered the parties' arguments, the administrative law judge has determined that Caterpillar has not shown, through clear and convincing evidence, that the MP 1300 was on sale prior to August 15, 2006. During the hearing, when shown the last page of RX-1167C, Dr. Fronczak testified as follows:

Q So do you have any reason to believe this is an invoice?

A Well, it could be an invoice because the way -- the way a lot of companies -- businesses do their invoicing is that they will put out a bill and then they will put out a revision to the bill and still call that an invoice. That's my experience. But that's just with small businesses. I don't know how they do this with this particular company.

Q Sure. But it's --

A It's a cancellation document, but it also has an invoice, has an invoice date on it. So the term "invoice" my understanding of the term "invoice," and I'm not an economist, but my understanding of the term "invoice" is that it can have multiple meanings.

You say it's not an invoice. I'm not prepared to say that it's not an invoice. I'm prepared to say it looks like it's a cancellation document with an invoice date on it.

Q In the middle of the document you see it states, "Cancellation of Invoice," it has an invoice number thereafter?

A I see that.

Q Okay. Didn't ask this earlier, but do you know what's redacted in these documents?

A Not specifically, no.

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Q Okay. Do you know if any of the other purported invoices that you cite in your witness statement also have corresponding cancellation documents?

A I do not know.

Fronczak Tr. 475-477. In sum, Dr. Fronczak testified that he was not familiar with the company's invoicing process ("I don't know how they do this with this particular company."), that he does not have specialized knowledge about the invoicing process (e.g., "I'm not an economist"), and that he does not know what is redacted in the documents, or why the redactions were made.⁶⁸ *See id.* The invoice alone, RX-1167C, is not clear and convincing given the heavy redactions and unexplained circumstances surrounding the cancellation order. The invoice also does not establish that the MP 1300 that Caterpillar alleges was sold is the same as the MP 1300 that is described in the OMM and Parts manuals, RX-0005 and RX-0006. Similarly, the OMM and Parts manuals do not show that the MP 1300 was on sale in the United States.⁶⁹ Caterpillar had the opportunity to obtain the evidence necessary to corroborate its arguments, but it did not obtain it, and Dr. Fronczak's testimony does not cure the deficiency. In the event that the MP 1300 is determined to be prior art, the administrative law judge has analyzed Caterpillar's arguments below.

2. Claim 1

For its invalidity analysis, Caterpillar divides claim 1 into six limitations, as follows:

[1.0] 1. A construction machine, comprising:

[1.1] a machine frame;

⁶⁸ RX-0984C (Fronczak WS) at Q/A 67-69 is not helpful because it simply refers to RX-1167C and opines that the on-sale bar is satisfied.

⁶⁹ Apart from obtaining a manual with the purchase of a machine, Caterpillar does not argue that the manuals were independent publically available before the critical date. *See, e.g.,* RX-0984C (Fronczak WS) at Q/A 70.

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- [1.2] a milling drum mounted to rotate about a milling drum axis, the milling drum axis being fixed relative to the machine frame;
- [1.3] a scraper blade located behind the milling drum with reference to a direction of travel of the construction machine, the scraper blade including an upper part and a lower part, the lower part being movable in a sliding non-pivotal motion relative to the upper part;
- [1.4] a lifting actuator connected between the upper and lower parts to slide the lower part relative to the upper part between a downward extended position and an upward retracted position; and
- [1.5] a swiveling actuator separate from the lifting actuator, the swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to extend to pivot the scraper blade upward about a swiveling axis parallel to and spaced apart from the milling drum axis.

Caterpillar Br. at 24-27.⁷⁰

a) [1.0] A construction machine

Caterpillar argues that the MP 1300 is a construction machine as described by the preamble. *See* Caterpillar Br. at 38-39.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 55-56 (Wirtgen disputes element [1.5]); Wirtgen Reply at 20-22 (same).

The evidence shows that the MP 1300 is a construction machine. *See* RX-0984C (Fronczak WS) at Q/A 79-80. Accordingly, the administrative law judge has determined that the MP 1300 is a construction machine, as the preamble requires.

b) [1.1] a machine frame

Caterpillar argues that the MP 1300 includes a machine frame. *See* Caterpillar Br. at 24.

⁷⁰ Elements [1.0]-[1.5] correspond to limitations 1[p]-1[e] from infringement.

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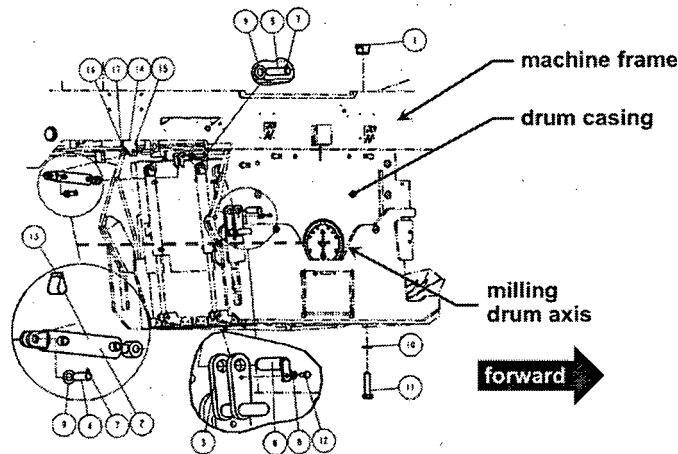
Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 55-56 (Wirtgen disputes element [1.5]); Wirtgen Reply at 20-22 (same).

The evidence shows that the MP 1300 includes a machine frame. *See* RX-0984C (Fronczak WS) at Q/A 81-82. Accordingly, the administrative law judge has determined that the MP 1300 includes a machine frame, as element [1.1] requires.

- c) ***[1.2] a milling drum mounted to rotate about a milling drum axis, the milling drum axis being fixed relative to the machine frame***

Caterpillar argues:

The MP 1300 machine includes a milling drum, mounted to rotate about a fixed axis relative to the machine frame. RX-0984C at Q/A 83-84; RX-0006.0028. The milling drum assembly illustrated in the parts manual shows that the milling drum axis is fixed relative to the machine frame:



As shown in RX-0006.0032 (above), the milling drum axis is fixed relative to the drum casing, and in turn, the drum casing is fixed relative to the machine frame. *Id.* Therefore, the milling drum axis is fixed relative to the machine frame. RX-0984C at Q/A 84. Thus, this limitation is satisfied, and Wirtgen does not assert otherwise.

Caterpillar Br. at 39-40.

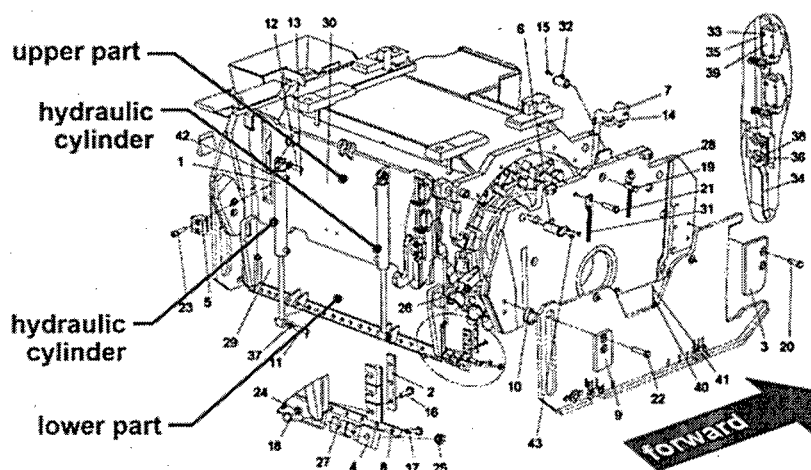
Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 55-56 (Wirtgen disputes element [1.5]); Wirtgen Reply at 20-22 (same).

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The evidence shows that the MP 1300 has a milling drum that can rotate about its axis, which is fixed relative to the machine frame. See RX-0984C (Fronczak WS) at Q/A 83-84. Accordingly, the administrative law judge has determined that the MP 1300 includes a milling drum that can rotate about its axis, which is fixed relative to the machine frame, as element [1.2] requires.

- d) ***[1.3] a scraper blade located behind the milling drum with reference to a direction of travel of the construction machine, the scraper blade including an upper part and a lower part, the lower part being movable in a sliding non-pivotal motion relative to the upper part***

Caterpillar argues that the MP1300 includes a two-part scraper blade behind the milling drum, where the lower part of the scraper blade can slide without pivoting relative to the upper part of the blade. See Caterpillar Br. at 40-41. Caterpillar provides the following figure:



RX-0006.0029

Id. at 40.

Wirtgen does not clearly rebut this argument. See generally Wirtgen Br. at 55-56 (Wirtgen disputes element [1.5]); Wirtgen Reply at 20-22 (same).

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The evidence shows that the MP 1300 includes a two-part scraper blade behind the milling drum, where the lower part of the scraper blade can slide without pivoting relative to the upper part of the blade. See RX-0984C (Fronczak WS) at Q/A 85-86. Accordingly, the administrative law judge has determined that the MP 1300 includes a two-part scraper blade behind the milling drum, where the lower part of the scraper blade can slide without pivoting relative to the upper part of the blade, as element [1.3] requires.

- e) ***[1.4] a lifting actuator connected between the upper and lower parts to slide the lower part relative to the upper part between a downward extended position and an upward retracted position***

Caterpillar argues:

The MP 1300 machine includes a lifting actuator connected between the upper and lower parts of the scraper blade to slide the lower part between a downward extended position and an upward retracted position. RX-0984C at Q/A 86-87. The upper and lower parts of the scraper blade are connected with lifting actuator hydraulic cylinders. RX-0006.0029. The parts manual shows part no. 1, "cylinder" connected between the two parts of the scraper blade. RX-0006.0029. The lower part slides relative to the upper part by retracting the vertical cylinders to raise the lower part. See RX-0005.0059. This limitation is satisfied, and Wirtgen does not assert otherwise.

Caterpillar Br. at 41-42.

Wirtgen does not clearly rebut this argument. See generally Wirtgen Br. at 55-56 (Wirtgen disputes element [1.5]); Wirtgen Reply at 20-22 (same).

The evidence shows that the MP 1300 includes lifting actuators that are connected between the upper and lower parts of the scraper blade to slide the lower part between a downward extended position and an upward retracted position. See RX-0984C (Fronczak WS) at Q/A 87-88. Accordingly, the administrative law judge has determined that the MP 1300 includes a lifting actuator, connected between the upper and lower parts of the scraper door, that

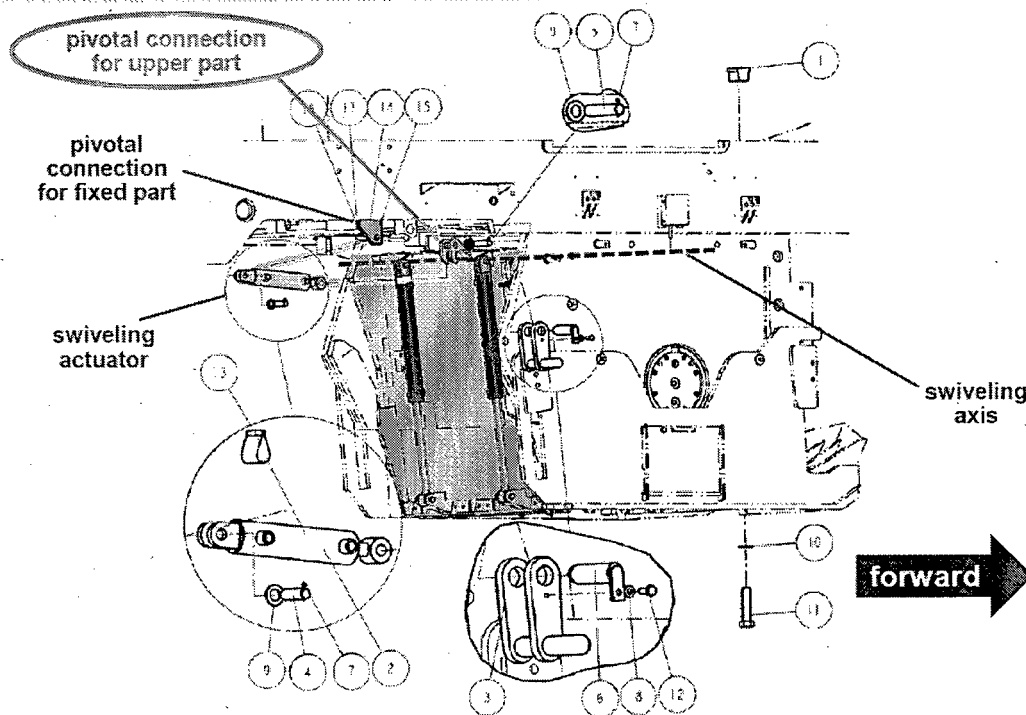
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slide the lower part relative to the upper part, between a downward extended position and an upward retracted position, as element [1.4] requires.

- f) ***[1.5] a swiveling actuator separate from the lifting actuator, the swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to extend to pivot the scraper blade upward about a swiveling axis parallel to and spaced apart from the milling drum axis.***

Caterpillar's entire argument follows:

The evidence shows that Element [1.5] is expressly satisfied by the MP 1300 machine. See RX-0984C at Q/A 89-90. First, MP 1300 discloses a "swiveling actuator," separate from the lifting actuator, which is shown in the parts manual as part no. 2, "cylinder," along with the rest of the milling drum assembly. RX-0006.0032.



RDX-0015.010 (citing RX-0006.0032)

The swiveling actuator above is attached between the upper part of the scraper blade and a fixed part fixed relative to the machine frame. RX-0984C at Q/A 90; Tr. (Fronczak) at 564:6-6-13. The figure above shows two lines which illustrate the connection points between the two ends of the swiveling actuator. RX-0984C at Q/A

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90; Tr. (Fronczak) at 564:14-565-10. The pivotal connection between the swiveling actuator and the fixed part occurs at the “support,” number 14 above, which is fixed relative to the machine frame. RX-0006.0032. The swiveling actuator in MP 1300 is configured to extend to pivot the scraper blade upward. RX-0984C at Q/A 90. The figure above shows the swiveling actuator in its retracted position, with the scraper blade in the vertical, lowered position. *Id.* To raise the scraper blade, the swiveling actuator extends, pushing the top of the scraper blade to the raised position and pivot about a parallel swiveling axis. RX-0984C at Q/A 90.

Wirtgen contends that the drawing above does not show the two ends of the cylinder being connected to the scraper blade and the fixed part, and that it fails to show that the swiveling actuator actually extend. CX-0007C at Q/A 89-95; Tr. (Meyer) at 219:6-13. Wirtgen also repeats its argument that without an inspection, it is impossible to understand whether this limitation is met. *Id.* Wirtgen again fails to cite any evidence that rebuts Dr. Fronczak’s analysis. Wirtgen also ignores the clear illustration in the figure of the two lines connecting the ends of the swiveling actuator to the scraper blade and fixed part. *See* RX-0006.0032. Wirtgen’s expert even admitted that these lines could show the attachment points of the cylinder. Tr. (Meyer) at 219:6-12. This limitation is satisfied by clear and convincing evidence.

Conclusion Regarding Unasserted Base Claim 1

For these reasons, base claim 1 is anticipated by the MP 1300. RX-0984C at Q/A 91.

Caterpillar Br. at 42-43.

Wirtgen argues that the drawing (RDX-0015.010, which cites RX-0006.0032) is of poor quality and that it also does not show how the cylinder operates. Wirtgen Br. at 56. Wirtgen also argues that the MP 1300 OMM does not show whether the cylinder retracts or extends “to cause the rear plate to raise.” *Id.* (citing CX-0007C (Meyer RWS) at Q/A 95).

Caterpillar argues that “Dr. Fronczak’s analysis on this point has gone un rebutted. As he explained in his testimony, any person of ordinary skill in the art considering this drawing would know that in order to function properly, a swiveling actuator located behind the scraper blade and

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above the swiveling axis must extend to swivel open the door.” Caterpillar Reply at 12.

Caterpillar’s argument then turns to obviousness:

In rebuttal, Wirtgen cites only to Dr. Meyer’s witness statement, which provides no reasoning on why this is not the case. Wirtgen PostHBr. at 56. Essentially, Wirtgen has limited its rebuttal on the MP 1300 to whether one modification would have been obvious—namely, moving the extending swiveling actuator from behind the scraper blade to in front of it. As explained above, and as the evidence has shown, this modification would have been obvious to a person of ordinary skill in the art.

Id. The only evidence that Caterpillar cites in its Reply is RX-0984C (Fronczak WS) at Q/A 90, which pertains to anticipation. *Id.*; RX-0984C (Fronczak WS) at Q/A 90.

Having considered the parties’ arguments, the administrative law judge has determined that Caterpillar has not shown, through clear and convincing evidence, that the MP 1300 includes a swiveling actuator that is configured as described in element [1.5]. In particular, the figure that Caterpillar relies on does not clearly show how the scraper door moves. *See* CX-0007C (Meyer RWS) at Q/A 95. Similarly, Dr. Fronczak’s witness statement is not clear and convincing because it relies extensively on a deposition transcript, RX-1007C, that was not admitted into evidence. *See, e.g.,* RX-0984C (Fronczak WS) at Q/A 90 (citing to “Mr. Schomaker’s testimony in RX-1007C”); Order No. 31 (April 30, 2018) (denying Caterpillar’s motion to admit the Bomag transcript).⁷¹ Further, Beyond one annotated drawing, Dr. Fronczak does not cite to the MP 1300 manuals in his analysis. *See, e.g.,* RX-0984C (Fronczak WS) at Q/A 89-91; *see also* CX-0007 (Meyer RWS) at Q/A 86-92, 95. Finally, in addition, Caterpillar and Dr. Fronczak did not examine or inspect the MP 1300, so there is no inspection evidence that might otherwise

⁷¹ Caterpillar’s Brief and Reply do not explain who Mr. Schomaker is.

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support Dr. Fronczak's opinion. *See* CX-0007 (Meyer RWS) at Q/A 88. Accordingly, Caterpillar has failed to show that the MP 1300 anticipates claim 1.

With regard to Caterpillar's argument that "the evidence has shown, this modification would have been obvious to a person of ordinary skill in the art," *see* Caterpillar Reply at 12, the administrative law judge has determined that Caterpillar has failed to show that claim 1 would have been obvious. Specifically, Dr. Fronczak's testimony on this point opines that the MP 1300 discloses this element, not that it would have been obvious. *See* RX-0984C (Fronczak WS) at Q/A 90-91; *see also* Caterpillar Br. at 43 ("base claim 1 is anticipated by the MP 1300").⁷² Accordingly, Caterpillar has failed to show, through clear and convincing evidence, that claim 1 would have been obvious in light of the MP 1300.

3. Claim 4

Claim 4 requires that "the swiveling actuator is pivotally connected to the upper part of the scraper blade at a pivotal connection having a pivotal axis lower in height than the swiveling axis." JX-0001 at 7:6-9.

Caterpillar argues:

First, claim 4 would have been obvious to a POSITA based on MP 1300 alone. *See* RX-0984C at Q/A 98. The swiveling actuator of MP 1300 is pivotally connected to the scraper blade at a pivotal connection which is located above the swiveling axis and behind the scraper blade in reference to a direction of travel of the machine. RX-0984C at Q/A 98; RX-0006.0029; RX-0006.0032. As previously explained, however, the function of the swiveling actuator is the same, regardless of whether it is attached above or below the swiveling axis, or in front of or behind the scraper blade—a swiveling actuator is used to pivot the scraper blade upward about an axis parallel to the axis of the milling drum. RX-0984C at Q/A 98. Given these limited options, it would have been obvious for a

⁷² To the extent necessary, the administrative law judge finds that Caterpillar has waived its argument that claim 1 would have been obvious in view of the MP 1300 by failing to include the argument in its post-hearing brief.

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POSITA to try moving the swiveling actuator from behind the scraper blade to in front of the scraper blade, thus changing from the design of MP 1300 to that of the claimed limitation. RX-0984C at Q/A 98. This change represents a choice from a finite number of identified, predictable solutions that would yield a reasonable expectation of success. *Id.*; *KSR*, 550 U.S. at 421. When the actuator is moved from behind to in front of the scraper blade, a POSITA would understand that the actuator must be located below the swiveling axis to extend to swivel the scraper blade. RX-0984C at Q/A 98.

Thus, it would have been obvious to try moving the attachment of the swiveling actuator from behind to in front of the scraper blade, and respectively mounting the swiveling actuator at a pivotal connection located below the swiveling axis, rather than above the swiveling axis. This change involves nothing more than a straightforward rearrangement of components without changing the operating principle of the scraper—a mere design choice—and involves no different engineering fundamentals. *Id.*; *see also ACCO*, 813 F.3d at 1367.

Caterpillar Br. at 44-45.

Wirtgen argues that “Caterpillar admits that the MP1300 ‘discloses a pivotal axis higher in height than the swiveling axis.’ RX-0984C.0026 (Fronczak Direct WS) (emphasis added); CX-0007C (Meyer Rebuttal WS) Q96-97. This limitation is absent from the MP1300.” Wirtgen Br. at 56-57. Wirtgen further argues that Caterpillar’s “obvious to try” argument does not identify “a design need or market pressure to solve a problem.” *Id.* at 57. Wirtgen argues that Caterpillar’s obvious-to-try modification “fail to address the clearance under the machine [that is] required to be successful.” *Id.* at 58.

Wirtgen also argues that the number of solutions Caterpillar identified is suspect:

Caterpillar simply chooses four possible configurations and then states that these are the only four solutions. To the contrary, a person of skill in the art would be faced with numerous variations on actuator configuration, including different attachment points and offsets. . . . there are myriad ways to design a scraper blade actuator system, each of which would have a different effect on the machine.

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Id. at 58.

Caterpillar replies that “Wirtgen tries to distract from the obviousness analysis by proposing ‘28 potential configurations’ of a scraper blade actuator system” as “all of the different ‘potential configurations’ that Wirtgen created boil down to the same basic concept—that a force is being applied to one side of a scraper blade to swivel it upward—and that no matter the physical position of the connection or angle of the actuator, the torque and force to swivel the door open is the same.” Caterpillar Reply at 8. Caterpillar cites to RX-0984C (Fronczak WS) at Q/A 96-98, which is Dr. Fronczak’s obvious-to-try analysis and MP 1300-and-Overton-combination analysis. *Id.* at 7.

Wirtgen replies that the subject matter of claim 4 “is not disclosed in any cited prior art.” Wirtgen Reply at 21. Wirtgen also argues that “There is no reason to modify the MP 1300, as one of skill in the art would not have even recognized the problem that Wirtgen’s actuator configuration was intended to address, and the decision to make the pivotal axis lower in height than the swiveling axis would give rise to a cascade of other machine design changes that implicate far more than a mere design choice.” *Id.* at 22.

Having considered the parties’ arguments, the administrative law judge has determined that although the MP 1300 does not explicitly disclose a machine where “the swiveling actuator is pivotally connected to the upper part of the scraper blade at a pivotal connection having a pivotal axis lower in height than the swiveling axis,” a person of ordinary skill in the art would have found that the specific requirements of claim 4 would have been obvious in view of the MP 1300. *See* RX-0984C (Fronczak WS) at Q/A 98; *KSR*, 550 U.S. at 417 (discussing predictable variations of known designs); *ACCO Brands Corp. v. Fellowes, Inc.*, 813 F.3d 1361, 1367 (Fed.

Cir. 2016) (concluding two “design choices [were] an obvious combination of prior-art elements”).

Caterpillar, however, has failed to show that a person of ordinary skill in the art would have found the arrangement described in claim 4 “obvious to try” because Caterpillar has not identified “a design need or market pressure to solve a problem.” *KSR*, 550 U.S. at 417. Indeed, Caterpillar has not identified a problem with the MP 1300—or construction-machine scraper doors, more generally—that would prompt a person of ordinary skill in the art to begin trying alternatives to the design. Likewise, Caterpillar has not identified a particular market force or other equivalent commercial incentive that would prompt a person of ordinary skill in the art to experiment with varying the MP 1300 or construction-machine scraper doors in general. Additionally, neither Caterpillar nor Dr. Fronczak have identified any prior art that might guide an inventor to the solution they allege is obvious to try. *See Bayer Schering Pharma AG v. Barr Labs., Inc.*, 575 F.3d 1341, 1347 (Fed. Cir. 2009) (“an invention is not obvious to try where vague prior art does not guide an inventor toward a particular solution.”); *Rolls-Royce, PLC v. United Techs. Corp.*, 603 F.3d 1325, 1339 (Fed. Cir. 2010) (“A particular course or selection is not obvious to try unless some design need or market pressure or other motivation would suggest to one of ordinary skill to pursue the claimed course or selection.”).⁷³

⁷³ In *In re Eli Lilly & Co.*, 902 F.2d 943, 945 (Fed. Cir. 1990) (citing to *In re O’Farrell*, 853 F.2d 894 (Fed. Cir. 1988)), the Federal Circuit explained that “An ‘obvious-to-try’ situation exists when a general disclosure may pique the scientist’s curiosity, such that further investigation might be done as a result of the disclosure, but the disclosure itself does not contain a sufficient teaching of how to obtain the desired result, or that the claimed result would be obtained if certain directions were pursued.” *Lilly* found the claims-at-issue obvious because (at least in part) the prior art, *Berger*, did more than merely invite experimentation. *Id.* at 948 (“The *Berger* disclosure does not merely invite experimentation, for *Berger* states that this specific product has the specific property of aiding weight gain in animals, naming cattle and sheep.”). Likewise, in a post-*KSR* case addressing the obvious-to-try doctrine, the Federal Circuit explained that “it would not be ‘obvious to try’ when the prior art gave either no indication of which parameters

4. Claim 5

Caterpillar argues:

As explained above, in the MP 1300, the swiveling actuator is located behind the scraper blade in reference to the direction of travel, and is attached at a pivotal connection to the upper part of the scraper blade. RX-0984C at Q/A 101; RX-0006.0032. In this arrangement, the swiveling axis of MP 1300 is located forward of the pivotal axis of the pivotal connection between the swiveling actuator and the scraper blade. *Id.* However, a POSITA would recognize that there are a limited number of realistic options for mounting a generally horizontal swiveling actuator to pivot the scraper blade open. RX-0984C at Q/A 101. When the swiveling actuator is mounted in this location, with the rod being extended to pivot open the scraper blade, the pivotal connection must be below the swiveling axis. RX-0984C at Q/A 101. This change in the MP 1300 would result in the pivotal connection being offset forward of the swiveling axis when the scraper blade is nearly vertical to allow the blade to be fully raised. *Id.* This change represents a straightforward rearrangement of components that perform the same and produce predictable, anticipated results. *Id.*; *see KSR*, 550 U.S. at 421. Thus, Caterpillar has established by clear and convincing evidence that claim 5 is obvious under 35 U.S.C. § 103 based on the MP 1300 alone.

Caterpillar Br. at 46-47.

Wirtgen argues:

Caterpillar relies on the solely on the same obvious-to-try rationale here as for claim 4 to cure this deficiency. RX-0984C.0029-30 (Fronczak Direct WS). For at least the reasons discussed earlier for claim 4, the MP1300—alone or in combination with Overton—also does not disclose or render obvious claim 5. CX-0007C (Meyer Rebuttal WS) Q113.

were critical or no direction as to which of many possible choices is likely to be successful.” *Sanofi-Aventis Deutschland GmbH v. Glenmark Pharm. Inc., USA*, 748 F.3d 1354, 1360 (Fed. Cir. 2014) (quotation marks to *O’Farrell* omitted); *see also In re Rosuvastatin Calcium Patent Litig.*, 703 F.3d 511, 518 (Fed. Cir. 2012) (the Federal Circuit has “explained that obviousness is not shown when what was ‘obvious to try’ was to explore a new technology or general approach that seemed to be a promising field of experimentation, where the prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it.” (quotation marks to *O’Farrell* omitted)).

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Caterpillar's obvious-to-try rational also fails to account for horizontal offset, *i.e.*, that the "swiveling axis [is] offset rearward from the pivotal axis of the pivotal connection relative to the direction of travel." In fact, Dr. Fronczak testified that horizontal offset "doesn't matter. Because what we're looking at is the line of action." Hearing Tr. 544:7-10 (Fronczak). Horizontal offset does matter—it's the only additional element recited in dependent claim 5. It also affects the ability to achieve a reduced swiveling radius, larger swiveling angle, and lower design height.

Like with claim 4, Caterpillar failed to demonstrate a motivation to modify the MP1300 to arrive at the invention of claim 5. Again, the only motivation alleged by Caterpillar's expert was protecting the hydraulic cylinder that swivels open the scraper blade. See RX-0984C.0029 (Fronczak Direct WS Q101). That rationale fails for the same reasons described above.

Wirtgen Br. at 63.

Caterpillar replies:

Wirtgen argues that for claim 5, Dr. Fronczak's analysis is incorrect because the "PM-565 has a swiveling axis offset forward from the pivotal axis." Wirtgen PostHBr. at 69. But again, this misses the point. Dr. Fronczak's analysis is based on a POSITA designing a scraper blade based on what is already known from the prior art PM-565 and MP 1300. Tr. (Fronczak) at 528:3-11. As Dr. Fronczak's testimony makes clear, a POSITA would have known what the four basic configurations of a scraper blade actuator were, and would have found it obvious to try all of these.

Caterpillar Reply at 8.

Wirtgen replies:

Caterpillar resorts to arguing that changing the offset would be a design choice from a finite number of design choices. Cat. PH Br. at 46-47. Even if that were true—which it is not—Caterpillar alleges no reason to modify the MP1300 or to select a rearward offset from among the limited offsets that Caterpillar contends are available. Merely asserting that something is a design choice is not a proper obviousness analysis. *Polaris Industries*, 882 F.3d at 1069 n.4.

Wirtgen Reply at 22.

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Having considered the parties' arguments, the administrative law judge has determined that although the MP 1300 does not explicitly disclose a machine where the scraper door assembly has a swiveling axis that "is offset rearward from the pivotal axis of the pivotal connection relative to the direction of travel," a person of ordinary skill in the art would have found that the specific requirements of claim 5 would have been obvious in view of the MP 1300. See RX-0984C (Fronczak WS) at Q/A 98⁷⁴; KSR, 550 U.S. at 417 (discussing predictable variations of known designs).

Additionally, Caterpillar has shown that there is a design need for arranging the swiveling axis behind (*i.e.* "offset rearward from the pivotal axis of the pivotal connection relative to the direction of travel") the scraper door because this arrangement protects the actuator rod from dirt and debris during milling. RX-0984C (Fronczak WS) at Q/A 101.⁷⁵ Further, Dr. Fronczak

⁷⁴ The administrative relies only on the fourth full paragraph of Dr. Fronczak's response to Q98 (the first paragraph contains a conclusion, the second and third paragraphs seem to contain non-controversial background, and the fifth paragraph relies on the obvious-to-try doctrine). The fourth paragraph follows:

However, the function of the swiveling actuator is the same, regardless of whether it is attached above or below the swiveling axis, or in front of or behind the scraper blade; a swiveling actuator is used to pivot the scraper blade upward about an axis parallel to the axis of the milling drum. Assuming that the type of cylinder remains the same (that is, a double-acting, single-ended cylinder is used as the swiveling actuator), the number of potential mounting configurations of a substantially horizontal swiveling actuator are limited. The actuator's pivotal connection could either be located above or below the swiveling axis, and could be located on the forward side or the rear side of the scraper blade. This is also explained by Wirtgen's Inventor Peter Busley in RX-0999C at 129:15-144:18 and in RX-0348C, RX-0349C, and RX-0350C to his transcript.

RX-0984C (Fronczak WS) at Q/A 98.

⁷⁵ This explanation satisfies *Polaris Industries's* direction that conclusions about the obviousness of the "particular placement of an element" in a design must be explained. *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1069 n.4 (Fed. Cir. 2018) ("The Board failed to consider that

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opined that the proposed modification “requires nothing more than a straightforward rearrangement of components that perform in the same manner as previously and which produce predictable, anticipated results.” *Id.* Accordingly, if claims 1 and 4 are assumed to be invalid, the administrative law judge has determined that Caterpillar has shown, through clear and convincing evidence, that a person of ordinary skill in the art would have found considered the subject matter of claim 5 obvious at the time of the invention.

5. Claim 9

For its invalidity analysis, Caterpillar divides claim 9 into nine limitations, as follows:

- [9.0] 9. A construction machine, comprising:
 - [9.1] a machine frame;
 - [9.2] a milling drum mounted to rotate about a milling drum axis, the milling drum axis being fixed relative to the machine frame;
 - [9.3] a scraper blade located behind the milling drum with reference to a direction of travel of the construction machine, the scraper blade including an upper part and a lower part;
 - [9.4] a lifting actuator connected between the upper and lower parts to move the lower part relative to the upper part between a downward extended position and an upward retracted position; and
 - [9.5] a swiveling actuator separate from the lifting actuator, the swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to pivot the scraper blade between an operating position and a raised position about a swiveling axis parallel to and spaced apart from the milling drum axis;

‘[m]erely stating that a particular placement of an element is a design choice does not make it obvious.’ *Cutsforth, Inc. v. MotivePower, Inc.*, 636 Fed. Appx. 575, 578 (Fed. Cir. 2016). Instead, the Board must explain why a person of ordinary skill in the art ‘would have selected these components for combination in the manner claimed.’ *In re Kotzab*, 217 F.3d 1365, 1371 (Fed. Cir. 2000)[.]”).

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wherein:

- [9.6] the swiveling actuator is connected to the fixed part at a machine side pivotal connection;
- [9.7] the swiveling actuator is connected to the scraper blade at a blade side pivotal connection, a pivotal axis of the blade side pivotal connection being lower in height than the swiveling axis; and
- [9.8] the swiveling axis is offset rearward from the pivotal axis of the blade side pivotal connection when the scraper blade is in the operating position.

See Caterpillar Br. at 47-49.⁷⁶

Wirtgen's entire reply for claim 9 is:

The MP1300 alone or in combination with Overton does not disclose or render obvious claim 9 because it fails to disclose various limitations of claims 1, 4, and 5, from which claim 9 depends. Those missing limitations are, as discussed above, (i) a “scraper blade including an upper part and a lower part, the lower part being movable in a sliding non-pivotal motion relative to the upper part;” (ii) a “swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to pivot the scraper blade between an operating position and a raised position about a swiveling axis parallel to and spaced apart from the milling drum axis;” (iii) a “swiveling actuator [that] is connected to the fixed part at a machine side pivotal connection;” (iv) a “swiveling actuator [that] is connected to the scraper blade at a blade side pivotal connection, a pivotal axis of the blade side pivotal connection being lower in height than the swiveling axis;” and (v) a “swiveling axis [that] is offset rearward from the pivotal axis of the blade side pivotal connection when the scraper blade is in the operating position.” CX-0007C (Meyer Rebuttal WS) Q116. The MP1300 machine—alone or in combination with Overton—fails to disclose or render obvious these claim features for the reasons discussed for claims 1, 4, and 5. CX-0007C (Meyer Rebuttal WS) Q116-126.

⁷⁶ Elements [9.0]-[9.8] correspond to limitations 9[p]-1[h] from infringement.

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Wirtgen Br. at 63-64. Dr. Meyer's testimony at Q/A 117-26, which addresses claim 9, simply relies on his analysis of claims 1, 4, and 5. *See, e.g.*, CX-0007C (Meyer RWS) at Q/A 117-26 (repeatedly referring to "the reasons discussed earlier in my testimony").

Wirtgen's entire reply follows:

Caterpillar essentially presents the same analysis for claim 9 here as it did for claim 9 in the context of the PM-565 above: cross-referencing its arguments for claims 4 and 5 to argue that one of skill in the art would modify the MP 1300 in multiple ways, without providing any motivation or reason to modify the MP1300 at all, much less in the ways recited. Cat. PH Br. at 49. Even if Overton was properly combined with the MP 1300—which it is not because it is not analogous—it would do nothing to bring the MP1300 any closer to the pivotal connections or rearward offset recited. CX-0007C (Meyer Rebuttal WS) Q116-126. Similarly, Claim 12 is nonobvious because it depends from claim 9, which is nonobvious as discussed above.

Wirtgen Reply at 22-23.

a) *Elements [9.0]-[9.4]*

Caterpillar argues that "Claim 9 recites the same elements as claim 1 for [9.0] through [9.4], and these limitations are expressly disclosed for the same reasons discussed above. *See* RX-0984C at Q/A 102-112." Caterpillar Br. at 47.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 63-64 (Wirtgen disputes element [9.5]); Wirtgen Reply at 22-23.

The evidence shows that limitations the MP 1300 discloses elements [9.0]-[9.4] of claim 9 for the same reasons that it discloses elements [1.0]-[1.4] of claim 1. *See* RX-0984C (Fronczak WS) at Q/A 103-12.

b) *Element [9.5]*

Element [9.5] follows:

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[9.5] a swiveling actuator separate from the lifting actuator, the swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to pivot the scraper blade between an operating position and a raised position about a swiveling axis parallel to and spaced apart from the milling drum axis;

JX-0001 at 7:38-45.

Caterpillar argues:

The evidence shows that Element [9.5] is expressly satisfied by MP 1300. *See* RX-0984C at Q/A 113-114. The only distinction between Element [9.5] and Element [1.5] is the replacement of the limitation requiring the swiveling actuator to extend, with a limitation requiring the swiveling actuator pivot the scraper blade between an operating position and a raised position. *Id.* MP 1300 meets both of these limitations. The swiveling actuator in MP 1300 is configured to operate by extending to swivel the scraper blade between the operating position and raised position. *See* RX-0984C at Q/A 90, 114. Wirtgen makes the same arguments about Caterpillar's evidence for this element as it did for Element [1.5]. CX-0007C (Meyer Rebuttal WS) at Q/A 119-120. Thus, for the same reasons described previously, this limitation is satisfied by clear and convincing evidence.

Caterpillar Br. at 48 (footnote omitted).

The administrative law judge previously determined that Caterpillar failed to show that the MP 1300 disclosed element [1.5]. The administrative law judge finds that Caterpillar has failed to show that the MP 1300 discloses element [9.5] for the same reasons: because the figure that Caterpillar relies on does not clearly show how the scraper door moves; because Dr. Fronczak's witness statement relies extensively on a deposition transcript, RX-1007C, that was not admitted into evidence; because apart from one annotated drawing, Dr. Fronczak does not cite to the MP 1300 manuals in his analysis; and because Caterpillar and Dr. Fronczak did not examine or inspect the MP 1300, so there is no inspection evidence that might otherwise support

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Dr. Fronczak's opinion. Accordingly, Caterpillar has failed to show, through clear and convincing evidence, that claim 9 would have been obvious in light of the MP 1300.

c) Element [9.6]

Element [9.6] requires that "the swiveling actuator is connected to the fixed part at a machine side pivotal connection[.]" JX-0001 at 8:2-3.

Dr. Fronczak testified as follows:

Q115. What is the next limitation of claim 9 of the '340 patent?

A: The next limitation is: "wherein the swiveling actuator is connected to the fixed part at a machine side pivotal connection."

Q116. In your opinion, does MP 1300 disclose this limitation?

A: Yes, referring to RDX-0002.40, MP 1300 discloses this limitation for the same reasons as I explained with regard to the claim 1 limitations. Referring now to RX-0006 at page 32, a person of ordinary skill in the art would understand that the "blade side pivotal connection" refers to the connection between the swiveling actuator and the scraper blade. Similarly, the "machine side pivotal connection" limitation refers to the connection between the swiveling actuator and the fixed part fixed relative to the machine frame. Thus, as shown in the demonstrative, MP 1300 meets this limitation.

RX-0984C (Fronczak WS) at Q/A 115-16. In response, Dr. Meyer responds to analysis in CDX-0012C at 18, which contends that the MP 1300 does not disclose this element because RX-0006 at 32 is a "poor quality image," because there is "no evidence" describing how the cylinder may operate, and because "Mr. Schomaker's testimony is deficient[.]" CX-0007C (Meyer RWS) at Q/A 121; CDX-0012C at 18.

Having considered the parties' arguments, the administrative law judge has determined that the MP 1300 discloses element [9.6]. See RX-0984C (Fronczak WS) at Q/A 115-16. Dr. Meyer's testimony does not respond to Dr. Fronczak's opinion, which leaves it un rebutted. Accordingly, the MP 1300 discloses element [9.6].

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d) Element [9.7]

Caterpillar's entire argument is "For the reasons discussed above for claim 4, this limitation would have been obvious to a POSITA over MP 1300 alone, or when combined with Overton. *See* RX-0984C at Q/A 117-119." Caterpillar Br. at 49.

The administrative law judge previously determined that Caterpillar has not shown that claim 4 would have been obvious in view of the MP 1300. Accordingly, the administrative law judge finds that Caterpillar has not shown that element [9.7] would have been obvious based on the same analysis and evidence.

e) Element [9.8]

Caterpillar's entire argument is "For the reasons discussed above for claim 5, this limitation would have been obvious to a POSITA over MP 1300 alone, or when combined with Overton. *See* RX-0984C at Q/A 120-121." Caterpillar Br. at 49. Likewise, Wirtgen's entire argument relies on its argument for claim 5. *See* Wirtgen Br. at 64; CX-0007C (Meyer RWS) at Q/A 125-26 (referring to "the reasons discussed earlier in my testimony").

The administrative law judge previously determined that claim 5 would have been obvious. Accordingly, the administrative law judge finds that Caterpillar has shown that element [9.8] would have been obvious based on the same analysis and evidence.

6. Claim 12

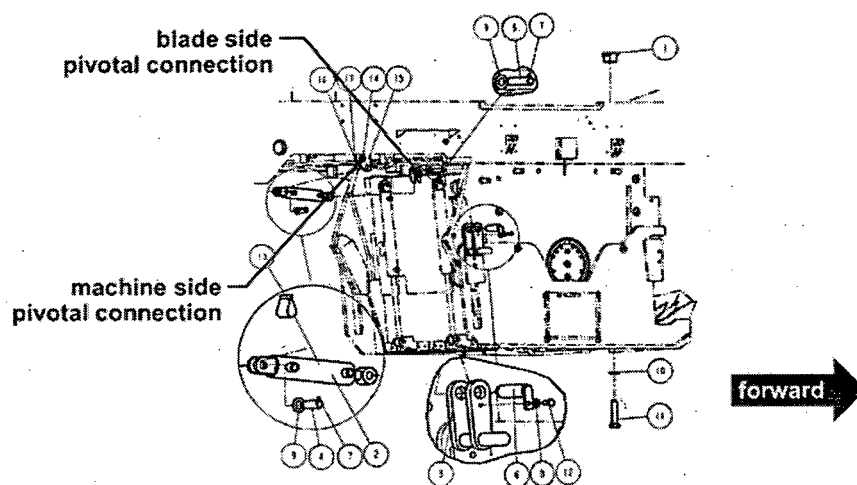
Claim 12 requires that the "pivotal axis of the machine side pivotal connection is located forward of the pivotal axis of the blade side pivotal connection." JX-0001 at 8:16-19.

Caterpillar argues:

As previously explained, the pivotal connection between the scraper blade and the swiveling actuator in MP 1300 is located above the swiveling axis and behind the scraper blade in reference to a direction of travel. RX-0006.0032; *See* RX-0984C at Q/A 124. In

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MP 1300, the machine side pivotal connection is located rearward of the blade side pivotal connection:



RX-0006.0032

However, as already explained, the function of the actuator is the same—it is used to swivel the scraper blade up about an axis parallel to the axis of the milling drum. RX-0984C at Q/A 124.

As explained regarding claim 4, it would have been obvious for a POSITA to try moving the swiveling actuator from behind the scraper blade to in front of the scraper blade. RX-0984C at Q/A 124. With this modification, a POSITA would understand that the machine side pivotal connection would be located forward of the blade side pivotal connection. *Id.*

Caterpillar Br. at 50.

Wirtgen argues:

Dependent claim 12 of the '340 patent recites "wherein: a pivotal axis of the machine side pivotal connection is located forward of the pivotal axis of the blade side pivotal connection." Caterpillar relies on the same obvious-to-try rationale here as it did for claims 4 and 5. Thus, for at least the reasons discussed earlier for claim 4, the MP1300 alone or in combination with Overton also does not disclose or render obvious claim 12. CX-0007C (Meyer Rebuttal WS) Q127.

Wirtgen Br. at 64.

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Having considered the parties' arguments, the administrative law judge has determined that although the MP 1300 does not explicitly disclose a machine where "a pivotal axis of the machine side pivotal connection is located forward of the pivotal axis of the blade side pivotal connection," a person of ordinary skill in the art would have found that the specific requirements of claim 12 would have been obvious in view of the MP 1300. *See* RX-0984C (Fronczak WS) at Q/A 124⁷⁷; *KSR*, 550 U.S. at 417 (discussing predictable variations of known designs).

As with claim 4, Caterpillar has not shown that a person of ordinary skill in the art would have found the arrangement described in claim 12 obvious to try because Caterpillar has not identified "a design need or market pressure to solve a problem." *KSR*, 550 U.S. at 417. Indeed, Caterpillar has not identified a problem with the MP 1300—or construction-machine scraper doors, more generally—that would prompt a person of ordinary skill in the art to begin trying alternatives to the design. Likewise, Caterpillar has not identified a particular market force or other equivalent commercial incentive that would prompt a person of ordinary skill in the art to

⁷⁷ The administrative relies only on the third full paragraph of Dr. Fronczak's response to Q124 (the first paragraph contains a conclusion, the second paragraph seems to contain non-controversial background, and the fourth paragraph invokes the obvious-to-try doctrine). The third paragraph follows:

However, the function of the actuator is the same, regardless of whether the swiveling actuator is attached above or below the swiveling axis, or in front of or behind the scraper blade; a swiveling actuator is used to swivel the scraper blade upward about an axis parallel to the axis of the milling drum. Assuming that the type of cylinder remains the same (that is, a double-acting, single-ended cylinder is used as the swiveling actuator), the number of potential mounting configurations of a substantially horizontal swiveling actuator are limited. Referring now to RDX-0002.47, the actuator's pivotal connection could either be located above or below the swiveling axis, and could be located on the forward side or the rear side of the scraper blade.

RX-0984C (Fronczak WS) at Q/A 124.

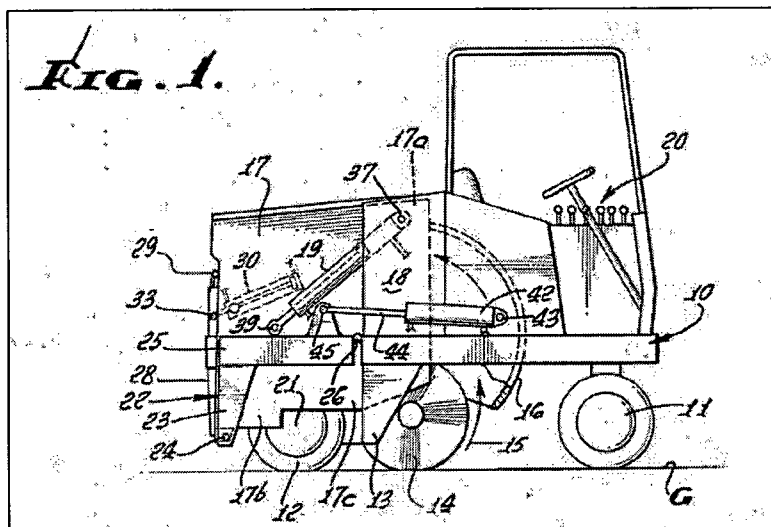
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experiment with varying the MP 1300 or construction-machine scraper doors in general.

Additionally, neither Caterpillar nor Dr. Fronczak have identified any prior art that might guide an inventor to the solution they allege is obvious to try. *See Bayer Schering Pharma AG v. Barr Labs., Inc.*, 575 F.3d 1341, 1347 (Fed. Cir. 2009) (“an invention is not obvious to try where vague prior art does not guide an inventor toward a particular solution.”). Accordingly, the administrative law judge finds that Caterpillar has not shown that claim 12 would have been obvious in view of the MP 1300.

F. Obviousness – Marini MP 1300 in View of Overton

Caterpillar argues that claims 4, 9, and 12 are “Obvious over MP 1300 in view of Overton.” Caterpillar Br. at 37. “Overton” (RX-0007) is U.S. Patent No. 3,761,988, which issued on October 2, 1973.⁷⁸ This is Figure 1 from Overton:



RX-0007 at 2.

1. Claim 4

Caterpillar argues:

⁷⁸ Wirtgen does not dispute that Overton is prior art under 35 U.S.C. § 102(b).

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MP 1300 combined with Overton also renders claim 4 obvious. RX-0984C at Q/A 99. Overton discloses a swiveling actuator pivotally connected at a pivotal axis lower in height than the swiveling axis, forward of the rear door. RX-0007 at Fig. 1. Overton uses a hydraulic cylinder to pivot a rear door away from a rotating drum. RX-0007 at 2:48-54; Figs. 1-4. Specifically, Overton's swiveling actuator extends to swivel the rear door upward about a swiveling axis, located above the pivotal axis of the rear door connection. *Id.*

As explained regarding PM-565, Overton is analogous art to MP 1300. Both references disclose machines that use a hydraulic cylinder to pivot open a rear door to a chamber on mobile equipment used in construction and maintenance of roads. A POSITA would recognize that Overton offers a design choice that utilizes a forward-mounted swiveling actuator cylinder that extends to open a rearward pivoting door. RX-0984C at Q/A 97. Overton explicitly discloses a door that is pivoted to swing open from near the top of the opening. RX-0007 at 2:46-47. Thus, a POSITA would have been motivated to combine Overton with MP 1300 to use an extending swiveling actuator, mounted forward of the rear door and below the swiveling axis as in Overton, to pivot the scraper blade upward. RX-0984C at Q/A 99.

Caterpillar Br. at 45.

While Wirtgen does not clearly rebut Caterpillar's arguments about Overton's disclosure, Wirtgen argues that Caterpillar has not provided a cogent rationale "provides no motivation to modify or combine [the] references[.]" *See* Wirtgen Br. at 54-64. Wirtgen also argues that Caterpillar's motivation to modify the MP 1300, *e.g.*, to protect the cylinder from exposure to debris, "is a completely fabricated objective that has no basis in the documentary record." *Id.* at 60.

Caterpillar's Reply argues that Overton is analogous art. *See* Caterpillar Reply at 9-10. Wirtgen replies that "Overton is not analogous art, does not disclose a swiveling actuator attached to a scraper blade at all, and does not provide any reason to modify the MP1300." *See* Wirtgen Reply at 21-22 (citing Meyer Tr. 272).

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Having considered the parties' arguments, the administrative law judge has determined that the MP 1300 and Overton collectively teach a construction machine with a swiveling actuator that "is pivotally connected to the upper part of the scraper blade at a pivotal connection having a pivotal axis lower in height than the swiveling axis," as claim 4 requires. *See* RX-0984C (Fronczak WS) at Q/A 99; RX-0007 at 1:39-40, 2:46-54 and Figs. 1-4.

The administrative law judge has also determined that Overton is analogous art. Overton discloses a heavy-duty machine that uses actuators to move various components of the machine. *See* RX-0007 at 1:5-56; *see also* RX-0984C at Q/A 97 ("A person of ordinary skill in the art would consider the design of machines with similar required functions to become familiar with designs that utilize a hydraulic cylinder to pivot open a door, and would look to Overton specifically because [of] the similar relevant operating characteristics."). Thus, even if Overton is not strictly from the same field of endeavor as the MP 1300, it is a reasonably pertinent reference that a person of ordinary skill in the art would consider when designing road-milling machines. *Id.*; *see also* KSR, 550 U.S. at 420 ("familiar items may have obvious uses beyond their primary purposes").

The administrative law judge has determined, however, that neither Caterpillar nor Dr. Fronczak has provided a sufficient rationale to explain why a person of ordinary skill in the art would modify the MP 1300 in view of Overton. On cross examination, Dr. Fronczak testified that he "wouldn't characterize" Overton as being concerned with protecting the cylinder rod:

Q If you would, please go back to Figure 1. There is really nothing to the rear of the dump door in Overton, is there?

A Not in this figure, no.

Q And I believe you testified that Overton has a cylinder for opening the dump door.

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A That is correct.

Q And it's identified by numeral 30?

A That is correct, I believe.

Q When 30 actuates, the dump door can open?

A When 30 extends, the dump door opens, that's correct.

Q And this actuator is within the container, right, container 17?

A A portion of it is, a portion of it is not.

Q And the cylinder is within the container where the debris is kept; right?

A The cylinder is in -- much of the cylinder is within the walls of the container where the debris has accumulated until it's dumped.

Q And debris is being shot upward into container 17; right?

A I wouldn't say "shot up." But it's moved upward. Colloquial term. I wouldn't argue with you, wouldn't want to get into a fight with you about it.

Q So this wouldn't be a protected location for cylinder 30, would it?

A Well, it depends, actually, what you would mean by protected. Because it's certainly protected from obstacles that would be close to, say, the -- it's interior to the container, so it's protected from any obstacles that could be encountered outside of the container. So it depends.

It would be certainly exposed to the -- to the debris. I wouldn't characterize it as a protected or unprotected. It is what it is. Now, if you want to say is it protected from the debris, I would say no. Is it in a protected position? It's in a protected position because it's inside the chamber.

Fronczak Tr. 482-484. In light of this testimony, the administrative law judge has determined that a person of ordinary skill in the art would not find the motivation to protect the cylinder rod in the teachings of Overton. *See* CX-0007C (Meyer RWS) at Q/A 115. Accordingly, the

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administrative law judge finds that Caterpillar has not shown that claim 4 would have been obvious over the MP 1300 in view of Overton.

2. Claim 9

Caterpillar's arguments do not present any unique analysis for claim 9. *See* Caterpillar Br. at 47-49 (citing RX-0984C (Fronczak WS) at Q/A 117-21).

a) Element [9.5]

Dr. Fronczak's testimony about element [9.5] relies solely on the MP 1300. *See* RX-0984C (Fronczak WS) at Q/A 114. Caterpillar does not cite to any testimony about the MP 1300 and Overton combination that warrants additional analysis for element [9.5]. *See* Caterpillar Br. at 48. Accordingly, the administrative law judge finds that the combination of the MP 1300 and Overton does not disclose element [9.5].

b) Element [9.7]

For element [9.7], Dr. Fronczak testified:

Q119. Do you have any alternative basis for your opinion that this limitation [*i.e.*, element [9.7]] would have been obvious?

A: Yes. In my opinion, MP 1300 combined with Overton also renders this claim obvious. Overton at 2:48-54 and in Figures 1 through 4 describe using a hydraulic cylinder to pivot a rear door away from a rotating drum. Referring now to Overton at 1:39-40; 2:50-54 and RDX-0002.43, the first cylinder disclosed by Overton, 30, extends from forward of the rear door to swivel the door upward. The cylinder is attached at point 33, representing the pivotal axis of the pivotal connection between the swiveling actuator and the rear door. This pivotal connection is located below the swiveling axis, 29. The swiveling actuator of Overton, therefore, operates by extending to swivel the rear door upward about a swiveling axis, which is located above the pivotal axis of the rear door connection.

RX-0984C (Fronczak WS) at Q/A 119.

As with claim 4, the administrative law judge has determined that the MP 1300 and Overton collectively teach a construction machine with a swiveling actuator that "is connected to

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the scraper blade at a blade side pivotal connection, a pivotal axis of the blade side pivotal connection being lower in height than the swiveling axis,” as element [9.7] requires. *See* RX-0984C (Fronczak WS) at Q/A 119; RX-0007 at 1:39-40, 2:46-54 and Figs. 1-4.

Caterpillar and Dr. Fronczak, however, have not provided a sufficient rationale for why a person of ordinary skill in the art would modify the MP 1300 in view of Overton (or combine the “references” as Caterpillar calls them), as discussed above in the analysis of claim 4.

3. Claim 12

Caterpillar argues:

MP 1300 combined with Overton also renders claim 12 obvious. Overton discloses a swiveling actuator pivotally connected at a pivotal axis lower in height than the swiveling axis, forward of the rear door. RX-0007 at Fig. 1; RX-0984C at Q/A 125. The machine side pivotal connection of Overton, 33, is located forward of the blade side pivotal connection. *Id.* The swiveling actuator of Overton, therefore, extends from forward of the rear door to pivot the door upward. RX-0984C at Q/A 125. Overton and MP 1300 are analogous art, as discussed above. *Id.* A POSITA would recognize the function of the swiveling actuator is to pivot the scraper blade up, and would be motivated to consider alternative options that met the design constraints. *Id.* Therefore, MP 1300 combined with Overton also renders this limitation obvious. Wirtgen makes the same arguments in claim 12 as it does in claim 4, and they are equally inapposite here. CX-0007C (Meyer Rebuttal WS) at Q/A 127. Accordingly, Caterpillar has demonstrated that claim 12 is rendered obvious under § 103 by clear and convincing evidence.

Caterpillar Br. at 51.

Wirtgen’s entire argument is:

Dependent claim 12 of the ‘340 patent recites “wherein: a pivotal axis of the machine side pivotal connection is located forward of the pivotal axis of the blade side pivotal connection.” Caterpillar relies on the same obvious-to-try rationale here as it did for claims 4 and 5. Thus, for at least the reasons discussed earlier for claim 4, the MP1300 alone or in combination with Overton also does not

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disclose or render obvious claim 12. CX-0007C (Meyer Rebuttal WS) Q127.

Wirtgen Br. at 64.

The administrative law judge previously determined that Caterpillar has not shown that claim 4 would have been obvious over the MP 1300 in view of Overton because neither Caterpillar nor Dr. Fronczak provided a sufficient rationale to explain why a person of ordinary skill in the art would modify the MP 1300 in view of Overton. Accordingly, the administrative law judge finds that claim 12 would not have been obvious based on the same analysis.

G. Obviousness – PM-565

Caterpillar argues that the PM-565 “renders each of asserted claims 4, 5, 9, and 12 obvious[.]” Caterpillar Br. at 21.

1. Whether the PM-565 Is Prior Art

Caterpillar argues that the PM-565 and contemporaneous manuals, “the PM-565 Operation & Maintenance Manual (‘OMM’) (RX-0001), the PM-565 Parts Manual (‘Parts Manual’) (RX-0002), and the PM-565 Service Training Meeting Guide (‘STMG’) (RX-0003)[.]” are prior art under 35 U.S.C. § 102(b). Caterpillar Br. at 22-23. Wirtgen does not does not clearly rebut this argument. *See generally* Wirtgen Br. at 64-77; Wirtgen Reply at 10-18. Accordingly, the administrative law judge has determined that the PM-565 and its manuals, RX-0001, RX-0002, and RX-0003, are §102(b) prior art to the ‘340 Patent. *See* RX-1158C (PM-565 Invoice); RX-0129C (PM-565 Invoice); RX-0987C (Rife WS) at Q/A 65 (describing that the invoices show sales dates of Mar. 15, 1995 and Sep. 15, 1995), Q/A 66 (linking the manuals to sales of machines with a specific model numbers (e.g., [] and [])); *see also* RX-0988C (Engelmann WS) at Q/A 49-50 (linking the manuals to machines with the same serial numbers).

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2. Claim 1

a) *[1.0] A construction machine*

Caterpillar argues that the PM565 is a construction machine as described by the preamble. *See* Caterpillar Br. at 24.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 64-68 (Wirtgen disputes element [1.5]); Wirtgen Reply at 11-17 (same).

The evidence shows that the PM-565 is a construction machine. *See* RX-0984C (Fronczak WS) at Q/A 147-148. Accordingly, the administrative law judge has determined that the PM565 is a construction machine, as the preamble requires.

b) *[1.1] a machine frame*

Caterpillar argues that the PM565 includes a machine frame. *See* Caterpillar Br. at 24. Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 64-68 (Wirtgen disputes element [1.5]); Wirtgen Reply at 11-17 (same).

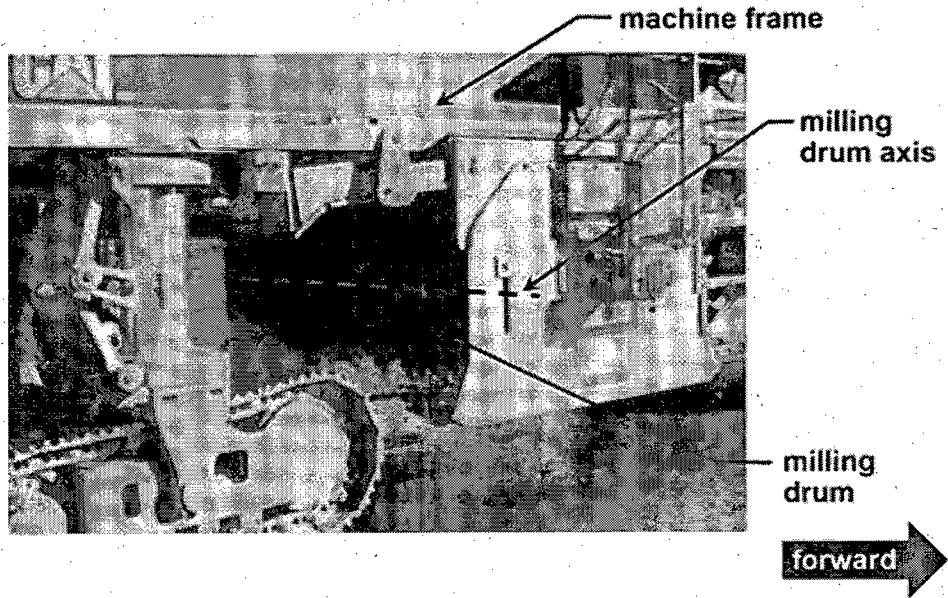
The evidence shows that the PM565 includes a machine frame. *See* RX-0984C (Fronczak WS) at Q/A 149-50. Accordingly, the administrative law judge has determined that the PM565 includes a machine frame, as element [1.1] requires.

c) *[1.2] a milling drum mounted to rotate about a milling drum axis, the milling drum axis being fixed relative to the machine frame*

Caterpillar argues:

The PM-565 machine includes a milling drum, referred to as the "rotor." RX-0984C at Q/A 151-152; RX-0002.0610-16; RX-0001.0061. The rotor of PM-565 is mounted to rotate about a fixed axis inside the drum casing, surrounding the rotor. RX-0001.0061; RX-0003.0013; RX-0567 (PM-565 Inspection-32). The milling drum axis is fixed relative to the drum casing, while the drum casing is fixed relative to the machine frame, as shown in the figure below:

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RX-0006.0028

Caterpillar Br. at 24-25.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 64-68 (Wirtgen disputes element [1.5]); Wirtgen Reply at 11-17 (same).

The evidence shows that the PM565 has a milling drum that can rotate about its axis, which is fixed relative to the machine frame. *See* RX-0984C (Fronczak WS) at Q/A 151-52. Accordingly, the administrative law judge has determined that the PM565 includes a milling drum that can rotate about its axis, which is fixed relative to the machine frame, as element [1.2] requires.

- d) ***[1.3] a scraper blade located behind the milling drum with reference to a direction of travel of the construction machine, the scraper blade including an upper part and a lower part, the lower part being movable in a sliding non-pivotal motion relative to the upper part***

Caterpillar argues that the PM565 includes a two-part scraper blade behind the milling drum, where the lower part of the scraper blade can slide without pivoting relative to the upper part of the blade. *See* Caterpillar Br. at 25-26.

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Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 64-68 (Wirtgen disputes element [1.5]); Wirtgen Reply at 11-17 (same).

The evidence shows that the PM565 includes a two-part scraper blade behind the milling drum, where the lower part of the scraper blade can slide without pivoting relative to the upper part of the blade. *See* RX-0984C (Fronczak WS) at Q/A 153-54. Accordingly, the administrative law judge has determined that the PM565 includes a two-part scraper blade behind the milling drum, where the lower part of the scraper blade can slide without pivoting relative to the upper part of the blade, as element [1.3] requires.

- e) ***[1.4] a lifting actuator connected between the upper and lower parts to slide the lower part relative to the upper part between a downward extended position and an upward retracted position***

Caterpillar argues:

The PM-565 machine includes a lifting actuator connected between the upper and lower parts of the scraper blade to slide the lower part between a downward extended position and an upward retracted position. RX-0984C at Q/A 155-156; Tr. (Meyer) at 213:15-18. For example, the STMG describes how “[w]hen the access door is being opened, the moldboard cylinders retract first, lifting the moldboard out of its end plate guides.” RX-0003.0087. The lifting actuators, referred to as “left and right moldboard cylinders,” can be seen clearly identified in the Parts Manual. RX-0002.0458. Video from the PM-565 inspection shows that when the lower part of the scraper blade is raised, the hydraulic lifting cylinders go from a downward, extended position to an upward, retracted position. RPX-0027 at 8:00-8:05.

Caterpillar Br. at 26-27.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 64-68 (Wirtgen disputes element [1.5]); Wirtgen Reply at 11-17 (same).

The evidence shows that the PM565 includes piston-cylinder actuators that are connected to the rotor service door and moldboard and that the actuators slide the moldboard relative to the

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rotor service door between a lower and upper position. See RX-0984C (Fronczak WS) at Q/A 155-56 (“PM-565 has “a lifting actuator,” comprising the two hydraulic cylinders described in RX-0003 at page 87 which connect the moldboard to the rotor service door.”). Accordingly, the administrative law judge has determined that the PM565 includes a lifting actuator, connected between the upper and lower parts of the scraper door, that slide the lower part relative to the upper part, between a downward extended position and an upward retracted position, as element [1.4] requires.

- f) ***[1.5] a swiveling actuator separate from the lifting actuator, the swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to extend to pivot the scraper blade upward about a swiveling axis parallel to and spaced apart from the milling drum axis.***

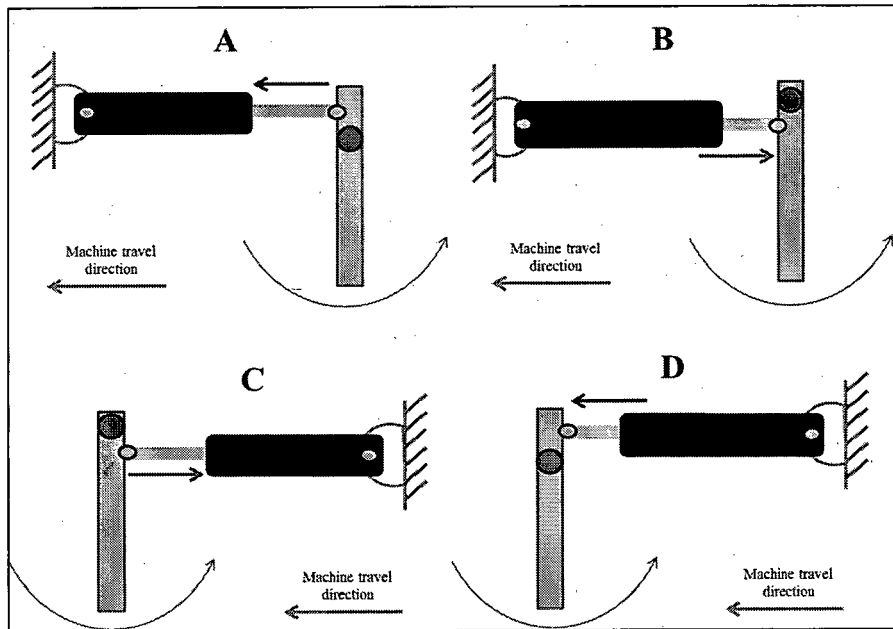
Caterpillar argues:

The PM-565 discloses a hydraulic cylinder, separate from the lifting actuators, connected between the rotor service door and a fixed part. RX-0001.0063; RX-0003.0087; RX-0548 (PM-565 Inspection-13); Tr. (Meyer) at 213:19-20. This hydraulic cylinder operates as a swiveling actuator, and is attached to a fixed part, which is in turn fixedly attached to the drum casing. RX-0002.0542-43; RX-0548. The drum casing is fixed relative to the machine frame; therefore, the swiveling actuator is connected to a fixed part fixed relative to the machine frame. RX-0003.0013; RX-0984C at Q/A 159.

The swiveling actuator in PM-565 is positioned above the swiveling axis. RX-0984C at Q/A 159; RX-0002.0542-43. The swiveling actuator operates by retracting and pivoting the door open. RX-0003.0087; RPX-0027 at 8:04-8:10, 8:35-8:43, 9:05-9:12; Tr. (Meyer) at 213:21-24. Although the swiveling actuator in PM-565 retracts, rather than extends, the basic operation and function of the swiveling actuator is to pivot the scraper blade up and away from the milling drum. RX-0984C at Q/A 159. This functionality is the same—regardless of whether it is attached above or below the swiveling axis, or in front of or behind the scraper blade—a swiveling actuator is used to pivot the scraper blade upward about an axis parallel to the axis of the milling drum. RX-0984C at Q/A 159. Assuming that the type of cylinder remains the same—i.e., a

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double-acting, single-ended cylinder—the number of potential mounting configurations of a substantially horizontal swiveling actuator is limited to just four. *Id.* As illustrated below, the actuator's pivotal connection could either be located above or below the swiveling axis, and could be located on the forward side or the rear side of the scraper blade. *Id.*



RDX-0002.0064 (Fronczak Direct Demonstrative)

Given these limited options, it would have been obvious for a POSITA to try moving the attachment point of the swiveling actuator from above the swiveling axis to below it, changing from the design of PM-565 (configuration “A”) to that of the claimed limitation (configuration “B”). RX-0984C at Q/A 159; Tr. (Fronczak) at 521:2-522:1. When the actuator is moved from above to below the swiveling axis, a POSITA would understand that, as shown above, the actuator would need to extend to swivel the scraper blade. RX-0984C at Q/A 159. This change represents a choice from a finite number of identified, predictable solutions that would yield a reasonable expectation of success. *Id.*; KSR, 550 U.S. at 421 (“When there is a design need . . . and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp.”). Further, this change involves nothing more than a straightforward rearrangement of components without changing the operating principle of the scraper—a mere design choice—and involves no different engineering fundamentals. RX-0984C at Q/A 159; Tr. (Fronczak) at 521:18-24. *See also* ACCO, 813 F.3d at 1367.

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Therefore, it would have been obvious for a POSITA to move the swiveling actuator below the swiveling axis, to change the design from that of PM-565 to that of the claimed limitation.

Caterpillar Br. at 27-29.

Wirtgen argues that the PM-565 “discloses a swiveling actuator configured to retract to pivot the scraper blade upward, not to extend.” Wirtgen Br. at 65 (quoting RX-0984C (Fronczak WS) at Q/A 159). Wirtgen argues that “Caterpillar’s rationale ignores the law governing obvious-to-try analyses” and that “Dr. Fronczak failed to address whether a design need or market pressure to solve a problem existed that would lead to his proposed modifications.” *Id.* Wirtgen adds:

Caterpillar’s obvious-to-try rationale again ignores the realities of building and reconfiguring a cold planer machine. CX-0007C.0033 (Meyer Rebuttal WS Q131). As discussed previously, considering the cost and complexity of cold milling machines, one of skill would not try various redesigns of crucial machine features that previously functioned satisfactorily without a strong motivation to do so, such as market forces or design need. CX-0007C.0034 (Meyer Rebuttal WS Q132-133). Caterpillar never sets forth any prior art market force or design need, aside from its flawed cylinder protection rationale.

Id. at 65-66.⁷⁹

Caterpillar replies, in part:

Wirtgen tries to distract from the obviousness analysis by proposing “28 potential configurations” of a scraper blade actuator system and claiming that Dr. Fronczak “greatly underrepresented the number of possible design choices by disregarding the impact that different offsets and angles have on overall machine functionality.” *See* Wirtgen PostHBr. at 31, 58. As Dr. Fronczak testified at trial, however, all of the different “potential configurations” that Wirtgen created boil down to the same basic concept—that a force is being

⁷⁹ Wirtgen contends that there are at least 28 configuration variants in the “obvious to try” analysis. *See* Wirtgen Br. at 31, 58 (citing Fronczak Tr. 520). It is not clear, however, which exhibit Wirtgen’s counsel was referring to, or whether the relevant image was included in an exhibit. In any event, Wirtgen has not provided a pinpoint cite to the image.

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applied to one side of a scraper blade to swivel it upward—and that no matter the physical position of the connection or angle of the actuator, the torque and force to swivel the door open is the same. Tr. (Fronczak) at 533:18-535:8.

Caterpillar Reply at 8.

Having considered the parties' arguments, the administrative law judge has determined that the PM565 does not explicitly disclose element [1.5] because the PM-565 includes a swiveling actuator that is configured to retract rather than extend. See RX-0984C (Fronczak WS) at Q/A 159 ("PM-565 discloses a swiveling actuator configured to retract to pivot the scraper blade upward."). However, a person of ordinary skill in the art would have found the specific requirement of element [1.5]—that the actuator extend (*e.g.*, that the door is pushed open)—would have been obvious in view of the PM-565. *Id.* at Q/A 158-59; *KSR*, 550 U.S. at 417 (discussing predictable variations of known designs).⁸⁰ Further, Dr. Fronczak testified that a person of ordinary skill in the art, *i.e.*, a person having a mechanical engineering degree and two to five years of experience designing construction machines, "would consider each of the possible configurations of the swiveling actuator described above, and would understand that any of these possibilities would be functional" when designing a construction machine. RX-0984C (Fronczak WS) at Q/A 159.⁸¹ This testimony is clear and convincing, and the administrative law

⁸⁰ The administrative law judge's conclusion does not rely on the obvious to try doctrine.

⁸¹ The administrative law judge does not accept Dr. Fronczak's opinion in the last full paragraph of his answer to Q159. In A159, Dr. Fronczak opines that "a person of ordinary skill in the art would have found a teaching, suggestion, or motivation in the prior art that would lead to the above mentioned modifications of PM-565 to arrive at the claimed invention." In support of his argument, Dr. Fronczak discusses the "overall machine height" and the height associated with "the top of the scraper blade." This aspect of Dr. Fronczak's opinion merely uses the teachings of the patent against the claims. See JX-0001 at 1:50-55 ("It is therefore an object of the invention to create a scraper device, the scraper blade of which is capable of swivelling with a large swivelling angle at a small swivelling radius, which realizes a low design height and does not require manual operation."); see also *id.* at 2:24-26 ("As a general rule, the swivelling device is to not increase the design height of the scraper device."); CX-0007C (Meyer RWS) at Q/A

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judge, therefore, finds that element [1.5] would have been obvious over the PM-565 at the time of the invention. *See Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016) (“Though less common, in appropriate circumstances, a patent can be obvious in light of a single prior art reference if it would have been obvious to modify that reference to arrive at the patented invention.”); *see also KSR*, 550 U.S. at 427 (“KSR provided convincing evidence that mounting a modular sensor on a fixed pivot point of the Asano pedal was a design step well within the grasp of a person of ordinary skill in the relevant art. Its arguments, and the record, demonstrate that claim 4 of the Engलगau patent is obvious.”); *Graham v. John Deere*, 383 U.S. at 25 (in finding that a particular arrangement of a shank and hinge plate in a plow would have been obvious, the Supreme Court noted that “Certainly a person having ordinary skill in the prior art, given the fact that the flex in the shank could be utilized more effectively if allowed to run the entire length of the shank, would immediately see that the thing to do was what Graham did, *i.e.*, invert the shank and the hinge plate.”); *ACCO Brands Corp. v. Fellowes, Inc.*, 813 F.3d 1361, 1367 (Fed. Cir. 2016) (concluding two “design choices [were] an obvious combination of prior-art elements”). Thus, in summary, the administrative law judge has determined that claim 1 would have been obvious in light of the PM-565.

3. Claim 4

Caterpillar argues:

First, claim 4 would have been obvious to a POSITA based on PM-565 alone. *See* RX-0984C at Q/A 163. As previously discussed, the swiveling actuator of PM-565 is pivotally connected to the rotor service door with a pivotal axis above the swiveling axis. RX-

133. Further, Dr. Fronczak’s opinion that RX-0130 (Horton) describes the “well-known problem” of debris exposure cannot be accepted because Dr. Fronczak could not remember the reference at the hearing. *See* Fronczak Tr. 487 (when asked about Horton, Dr. Fronczak replied “I can honestly say I do not recall this.”). Thus, Horton is not accepted as “a teaching, suggestion, or motivation in the prior art” as suggested in Q/A 159.

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0002.0542-43; RX-0548 (PM-565 Inspection-13); RX-0549 (PM-565 Inspection-14); RPX-0027 at 12:50-12:55, 16:15-16:24. Because the swiveling actuator is located above the swiveling axis, it operates by retracting to swivel the scraper blade upwards. RX-0984C at Q/A 163; RX-0003.0087; RPX-0027 at 8:04-8:10, 8:35-8:43, 9:05-9:12. However, a POSITA would have understood that in order to operate by extending to pivot the scraper blade, the swiveling actuator would need to have a pivotal connection to the rotor service door lower than the swiveling axis. RX-0984C at Q/A 163. For the reasons discussed above, it would have been obvious to a POSITA to position the actuator in this manner. *Id.*

Caterpillar Br. at 32.

Wirtgen argues that the PM-565 does not explicitly disclose a scraper door assembly where “the swiveling actuator is pivotally connected to the upper part of the scraper blade at a pivotal connection having a pivotal axis lower in height than the swiveling axis,” as claim 4 requires. Wirtgen Br. at 65. Wirtgen argues that Caterpillar argues claim 4 is obvious “under the same obvious-to-try theory set forth for the MP1300.” *Id.* Wirtgen argues that Caterpillar has not identified “any prior art market force or design need, aside from its flawed cylinder protection rationale.” Wirtgen also claims that “sole prior-art motivation to modify the PM-565 to arrive at the invention of claim 4—protecting the swiveling cylinder as discussed in Horton—unraveled during the hearing.” *Id.* at 66. Wirtgen also argues that “Caterpillar’s obvious-to-try argument also fails to address the effects of altering the placement and connections of the swiveling actuator.” *Id.* at 67.

Having considered the parties’ arguments, the administrative law judge has determined that the PM565 does not explicitly disclose the specific requirements of claim 4 because the PM-565 features a scraper door assembly with a pivotal axis higher in height than the swiveling axis. *See* RX-0984C (Fronczak WS) at Q/A 163 (“the pivotal connection of the swiveling actuator in PM-565 is located above the swiveling axis, because it operates by retracting to swivel the

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scraper blade upwards.”). However, a person of ordinary skill in the art would have found the specific arrangement of claim 4—where the pivotal connection is lower than the swiveling axis—would have been obvious in view of the PM-565. *Id.*; KSR, 550 U.S. at 417 (discussing predictable variations of known designs). Further, the evidence shows that a person of ordinary skill in the art, *i.e.*, a person having a mechanical engineering degree and two to five years of experience designing construction machines, when designing a construction machine, would consider various configurations of the swiveling actuator and understand that the various possibilities would be functional. *See* RX-0984C (Fronczak WS) at Q/A 159.⁸² This testimony is clear and convincing, and the administrative law judge, therefore, finds that claim 4 would have been obvious over the PM-565 at the time of the invention. *See Arendi, KSR, Graham, ACCO Brands, supra.*

4. Claim 5

Claim 5 requires that the swiveling axis from claims 1 and 4 “is offset rearward from the pivotal axis of the pivotal connection relative to the direction of travel.” JX-0001 at 7:10-13.

Caterpillar argues:

The swiveling axis in PM-565 is offset slightly forward of the pivotal axis. RX-0002.0543; RPX-0027 at 12:50-12:53 and 16:15-16:24. However, the relative forward or rearward position of the pivotal connection between the swiveling actuator and the scraper blade is a matter of design choice. RX-0984C at Q/A 167; Tr. (Fronczak) at 545:20-546:4. As discussed earlier regarding claim 4, a POSITA would have understood that the swiveling actuator could be attached either above or below the swiveling axis, and either forward or rearward of the scraper blade. *Id.* If an extending actuator were located in front of the scraper blade, the actuator would need to be located below the swiveling axis, and the swiveling axis would be offset rearward to allow the scraper blade to pivot upward fully. *Id.* Thus, PM-565 combined with the

⁸² The administrative law judge’s critique of Dr. Fronczak’s opinion in the last full paragraph of his answer to Q159 still applies.

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knowledge of a person of skill in the art also renders this limitation obvious.

Caterpillar Br. at 34.

Wirtgen argues, in part:

Caterpillar relies on the same faulty obvious-to-try rationale here as it did for claim 4. RX-0984C.0029-30 (Fronczak Direct WS); CDX-0012C.32 (Meyer Rebuttal Demonstrative); CX-0007C (Meyer Rebuttal WS) Q150-51. For at least the reasons discussed earlier for claim 4, the PM-565—alone or in combination with Overton—also does not disclose or render obvious claim 5. CX-0007C (Meyer Rebuttal WS) Q150-51.

...

Common sense (and physics) contradicts Dr. Fronczak's testimony that changing the offset would not affect the degree to which the scraper blade could open. See Hearing Tr. 526:12-17 (Fronczak). In fact, at one point during his testimony, Dr. Fronczak affirmatively stated that offset could change the degree to which a particular design configuration could open a door. See Hearing Tr. 538:16-20 (Fronczak) ("You'd have to look at the details of the lengths of the cylinders, the particular offset, the particular relationship between where the cylinder and the door come together..." (emphasis added)). Dr. Fronczak's refusal to acknowledge that claim 5's sole limitation actually matters and can affect the door's swiveling angle demonstrates the inattention to detail that permeates his invalidity analyses. Dr. Fronczak's conclusory arguments do not provide the clear and convincing evidence required to find claim obvious.

Wirtgen Br. at 69-70. Wirtgen also critiques Dr. Fronczak's demonstratives and an unclear portion of his answer to Q167. *Id.* at 70.

Having considered the parties' arguments, the administrative law judge has determined that the PM-565 does not explicitly disclose a machine where the scraper door assembly has a swiveling axis that "is offset rearward from the pivotal axis of the pivotal connection relative to the direction of travel." Nevertheless, to a person of ordinary skill in the art, the specific requirements of claim 5 would have been obvious in view of the PM-565. See RX-0984C

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(Fronczak WS) at Q/A 167⁸³; *KSR*, 550 U.S. at 417 (discussing predictable variations of known designs). In particular, the relative forward or rearward position of the pivotal connection between the swiveling actuator and the scraper blade is a matter of design choice. *Id.*; Fronczak Tr. 545-546. This is an example of ordinary engineering, not patentable innovation. *See KSR*, 550 U.S. at 427 (“the results of ordinary innovation are not the subject of exclusive rights under the patent laws”). The administrative law judge, therefore, finds that claim 5 would have been obvious over the PM-565 at the time of the invention.

5. Claim 9

Caterpillar argues that claim 9 is obvious. *See Caterpillar Br.* at 34-36.

Wirtgen’s entire reply for claim 9 is:

The PM-565 alone in combination with RX-0007 (Overton) or the MP1300 does not disclose or render obvious the following limitations as required by claim 9, which are discussed in claims 1, 4, and 5: (i) a “swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to pivot the scraper blade between an operating position and a raised position about a swiveling axis parallel to and spaced apart from the milling

⁸³ The last sentence of the third paragraph of Dr. Fronczak’s answer appears to contain ten extra words: “in front of the decided to orient the swiveling actuator.” When these words are struck, the paragraph reads:

However, the relative forward or rearward position of the pivotal connection between the swiveling actuator and the scraper blade is associated with the design choice of where the actuator is located is a matter of design choice. As discussed earlier regarding claim 4, a person of ordinary skill in the art would have understood that the swiveling actuator could be attached either above or below the swiveling axis, and either forward or rearward of the scraper blade. Referring now to RDX-0002.74, when a person of ordinary skill in the art would understand that, if an extending actuator were located ~~in front of the decided to orient the swiveling actuator~~ in front of the scraper blade, using an extending actuator, the swiveling actuator would need to be located below the swiveling axis.

RX-0984C (Fronczak WS) at Q/A 167 (bold and strikethrough added).

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drum axis;” (ii) a “swiveling actuator [that] is connected to the scraper blade at a blade side pivotal connection, a pivotal axis of the blade side pivotal connection being lower in height than the swiveling axis;” and (iii) “swiveling axis [that] is offset rearward from the pivotal axis of the blade side pivotal connection when the scraper blade is in the operating position.” CDX-0012C.33-34 (Meyer Rebuttal Demonstrative); CX-0007C.0039-42 (Meyer Rebuttal WS Q154-164).

Wirtgen Br. at 70-71.

Wirtgen’s entire reply follows:

Independent claim 9 recites many of the features of claim 1, and Caterpillar therefore incorporates by reference its arguments for those limitations. Like claims 4 and 5, however, claim 9 recites two additional limitations, neither of which are found in the prior art. Specifically, claim 9 recites that “the pivotal axis of the blade-side pivotal connection is lower in height than the swiveling axis,” and that “the swiveling axis is offset rearward from the pivotal axis of the blade side pivotal connection when the scraper blade is in the operating position.” Caterpillar cross-references its arguments for claims 4 and 5, asserting that a POSA would modify the PM-565 in at least two ways in order to arrive at claim 9. Cat. PH Br. at 36. Caterpillar provides no actual motivation to combine the PM-565 with Overton, no analysis of why Overton is analogous art, and no reason why a POSA would try to modify the PM-565 in multiple ways. Instead, Caterpillar just states that these modifications would be mere design choices, as though making that blanket assertion were a substitute for an obviousness analysis. Cat. PH Br. at 33-34. It is not. Claim 12 is nonobvious because it depends from claim 9, which is nonobvious as discussed above.

Wirtgen Reply at 18. Thus, Wirtgen disputes elements [9.5], [9.7], and [9.8].

a) Elements [9.0]-[9.4]

Caterpillar argues that “Claim 9 recites the same elements as claim 1 for [9.0] through [9.4], and these limitations are expressly disclosed for the same reasons discussed above. *See* RX-0984C at Q/A 168-178.” Caterpillar Br. at 34.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 70-71 (Wirtgen disputes elements [9.5], [9.7], and [9.8]); Wirtgen Reply at 18.

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The evidence shows that limitations the PM-565 discloses elements [9.0]-[9.4] of claim 9 for the same reasons that it discloses elements [1.0]-[1.4] of claim 1. *See* RX-0984C (Fronczak WS) at Q/A 168-78.

b) Element [9.5]

Element [9.5] follows:

[9.5] a swiveling actuator separate from the lifting actuator, the swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to pivot the scraper blade between an operating position and a raised position about a swiveling axis parallel to and spaced apart from the milling drum axis;

JX-0001 at 7:38-45.

Caterpillar argues:

Here, the evidence shows that Element [1.5] is expressly satisfied by the PM-565 machine. *See* RX-0984C at Q/A 179-180. The distinction between Element [9.5] and Element [1.5] is the replacement of the limitation requiring the swiveling actuator to extend, with a limitation requiring the swiveling actuator pivot the scraper blade between an operating position and a raised position. PM-565 meets this limitation. RX-0984C at Q/A 180. The swiveling actuator in PM-565 is configured to retract and pivot the scraper blade upward from the operating position to the raised position. RX-0003.0087; RPX-0027 at 8:04-8:10, 8:35-8:43, 9:05-9:12. This pivoting occurs about a swiveling axis parallel to and spaced apart from the milling drum axis. RX-0003.0013; RX-0984C at Q/A 180. Wirtgen contends that this limitation is not satisfied for the same reasons as discussed in Element [1.5], where it disputes the obviousness of using an extending actuator. However, as shown above, this limitation does not require the swiveling actuator to extend to pivot the scraper blade, only that it pivot between the operating and raised positions. Caterpillar has shown by clear and convincing evidence that this limitation is satisfied, and Wirtgen makes no independent arguments to the contrary.

Caterpillar Br. at 48 (footnote omitted).

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Wirtgen's brief cites to Dr. Meyer's witness statement without providing an explanation for its argument. *See* Wirtgen Br. at 70-71. Dr. Meyer, Wirtgen's expert, testified as follows:

156. Q. What is your opinion regarding if PM-565 and RX-0007 (Overton) disclose a "swiveling actuator being connected between the upper part of the scraper blade and a fixed part fixed relative to the machine frame, the swiveling actuator being configured to pivot the scraper blade between an operating position and a raised position about a swiveling axis parallel to and spaced apart from the milling drum axis?"

A. The combination of the PM-565 and RX-0007 (Overton) fails to disclose this claim feature for at least the reasons as discussed in claim 1. And, Dr. Fronczak does not set forth any additional motivation for claim 9 beyond his reasons given in claim 1. Therefore, Dr. Fronczak provides no testimony on what would motivate a POSA to arrive at the narrower configuration of claim 9.

CX-0007C (Meyer RWS) at Q/A 156.

The evidence shows that the PM-565 discloses element [9.5]. *See* RX-0984C (Fronczak WS) at Q/A 180. Dr. Fronczak testified as follows:

Q180. In your opinion, does PM-565 disclose [element [9.5]]?

A: Yes, referring to RDX-0002.86, RDX-0002.87, RDX-0002.88, and RDX-0002.89, PM-565 discloses this limitation for the same reasons as I explained with regard to the claim 1 limitations. The only distinction here is the replacement of the limitation requiring the swiveling actuator to extend in claim 1, with a limitation requiring the swiveling actuator pivot the scraper blade between an operating position and a raised position. PM-565 meets this limitation. As shown in RX-0003 at page 87, the swiveling actuator in PM-565 is configured to retract, swiveling the service door upward from the operating position to the raised position. This swiveling occurs about a swiveling axis parallel to and spaced apart from the milling drum axis.

The operation of the swiveling actuator can be also seen in video from the PM-565 inspection. For example, in RPX-0027, the swiveling actuator can be seen retracting and pulling the scraper blade upward about the swiveling axis from 8:04-8:10, 8:35-8:43, and 9:05-9:12. Thus, PM-565 meets this limitation.

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RX-0984C (Fronczak RWS) at Q/A 180. This testimony, and the evidence it cites, is more persuasive than Dr. Meyer's because it explains the basis for the opinion. Accordingly, Caterpillar has shown, through clear and convincing evidence, that the PM-565 discloses element [9.5].

c) Element [9.6]

Element [9.6] requires that "the swiveling actuator is connected to the fixed part at a machine side pivotal connection[.]" JX-0001 at 8:2-3.

Dr. Fronczak testified as follows:

Q181. What is the next limitation of claim 9 of the '340 patent?

A: The next limitation is: "wherein the swiveling actuator is connected to the fixed part at a machine side pivotal connection."

Q182. In your opinion, does PM-565 disclose this limitation?

A: Yes, referring now to RDX-0002.90, PM-565 discloses this limitation for the same reasons as I explained with regard to claim 1. A person of ordinary skill in the art would understand that the "blade side pivotal connection" refers to the connection between the swiveling actuator and the scraper blade. Similarly, as shown in RX-0002 at page 543, the "machine side pivotal connection" limitation refers to the connection between the swiveling actuator and the fixed part fixed relative to the machine frame. The position of these connections can also be seen from the PM-565 inspection photos and video, such as RX-0549.

RX-0984C (Fronczak WS) at Q/A 181-82.

Wirtgen and Dr. Meyer do not address this limitation. *See* Wirtgen Br. at 70-71; Wirtgen Reply at 18; CX-0007 (Meyer RWS) at Q/A 154-64.

Having considered the parties' arguments, the administrative law judge has determined that the PM-565 discloses element [9.6]. *See* RX-0984C (Fronczak WS) at Q/A 181-82. Dr. Meyer's testimony does not respond to Dr. Fronczak's opinion, which leaves it un rebutted.

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d) Element [9.7]

Caterpillar's entire argument is "For the reasons discussed above for claim 4, this limitation would have been obvious to a POSITA over PM-565 alone, or when combined with Overton. *See* RX-0984C at Q/A 183-184." Caterpillar Br. at 36.

Dr. Meyer's testimony on this limitation references claim 1:

158. Q. What is your opinion regarding whether the PM-565 and RX-0007 (Overton) disclose a "swiveling actuator [that] is connected to the scraper blade at a blade side pivotal connection, a pivotal axis of the blade side pivotal connection being lower in height than the swiveling axis" [?]

A. The combination of the PM-565 and RX-0007 (Overton) fails to disclose or render obvious this claim feature for at least the reasons as discussed earlier in my testimony for claim 1. And, Dr. Fronczak does not set forth any additional motivation for claim 9 beyond his reasons given in claim 1. Therefore, Dr. Fronczak provides no testimony on what would motivate a POSA to arrive at the narrower configuration of claim 9.

CX-0007C (Meyer RWS) at Q/A 158.

The administrative law judge previously determined that claim 4 was obvious in light of the PM-565. Further, Dr. Meyer's testimony does not rebut Dr. Fronczak's testimony. Accordingly, the administrative law judge finds that element [9.7] would have been obvious. *See* RX-0984C (Fronczak WS) at Q/A 183-84.

e) Element [9.8]

Caterpillar argues "For the reasons discussed above for claim 5, this limitation would have been obvious to a POSITA over PM-565 alone, or when combined with Overton. *See* RX-0984C at Q/A 185-186." Caterpillar Br. at 36. Likewise, Dr. Meyer's opinion relies on "the reasons as discussed earlier in my testimony." CX-0007C (Meyer RWS) at Q/A 160.

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The administrative law judge previously determined that claim 5 would have been obvious. Accordingly, the administrative law judge finds that Caterpillar has shown that element [9.8] would have been obvious based on the same analysis and evidence.

Thus, in summary, the administrative law judge finds that claim 9 would have been obvious in light of the PM-565.

6. Claim 12

Claim 12 requires that the “pivotal axis of the machine side pivotal connection is located forward of the pivotal axis of the blade side pivotal connection.” JX-0001 at 8:16-19.

Caterpillar argues:

... The additional limitations of claim 12 are expressly disclosed by PM-565; therefore claim 12 also is obvious for the same reasons. *See* RX-0984C at Q/A 188-190. The pivotal axis of the machine side pivotal connection of the swiveling actuator is located forward of the blade side pivotal connection of the swiveling actuator. RX-0002.0543; RX-0548; RPX-0027 at 13:00. ...

Caterpillar Br. at 37.

Wirtgen argues:

Dependent claim 12 of the ‘340 patent recites “wherein: a pivotal axis of the machine side pivotal connection is located forward of the pivotal axis of the blade side pivotal connection.” Caterpillar relies on the same obvious-to-try rationale here as it did for claims 1, 4, and 5. Thus, for at least the reasons discussed earlier for claims 1, 4, and 5, the MP1300 [*sic*, PM-565] alone or in combination with any other machine or reference also does not disclose or render obvious claim 12. CX-0007C (Meyer Rebuttal WS) Q165-166.

Wirtgen Br. at 71.

The administrative law judge has determined that Caterpillar has shown that the PM-565 expressly discloses the subject matter of claim 12. *See* RX-0984C (Fronczak WS) at Q/A 188-90. Dr. Meyer’s testimony does not rebut Dr. Fronczak’s opinion. *See* CX-0007C (Meyer

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RWS) at Q/A 165. Accordingly, the administrative law judge finds that claim 12 would have been obvious in light of the PM-565.

H. Obviousness – PM-565 in View of Overton

Caterpillar argues that claims 4, 9, and 12 are obvious “over PM-565 in view of Overton.” Caterpillar Br. at 21. Caterpillar references Overton when discussing claims 1, 4, 5, 9, and 12. *Id.* at 21-37.

1. Claim 1

For element [1.5], Caterpillar argues:

To the extent that PM-565 with the knowledge of a POSITA does not render obvious a swiveling actuator that is “configured to extend,” this limitation is rendered obvious when PM-565 is combined with Overton. *See* RX-0984C at Q/A 160; RX-0007 (Overton). . . .

Overton uses a hydraulic cylinder to pivot a rear door away from a rotating drum. RX-0007 at 2:48-54; Figs. 1-4. The first cylinder disclosed by Overton, 30, operates by extending from in front of the rear door to swivel the door upward. *Id.* at 1:39-40; 2:50-54. The cylinder is attached at point 33, representing the pivotal axis of the pivotal connection between the swiveling actuator and the rear door. RX-0984C at Q/A 160. This pivotal connection is located below the swiveling axis, 29. *Id.* The swiveling actuator of Overton, therefore, operates by extending to swivel the rear door upward about a swiveling axis, which is located above the pivotal axis of the rear door connection. *Id.*; RX-0007 at Fig. 1 (below).

Caterpillar Br. at 29. Caterpillar also argues that Overton is analogous art. *Id.* at 30-31.

Caterpillar concludes:

A POSITA would have been motivated to combine the extending swiveling actuator, mounted below the swiveling axis in Overton, with the scraper blade in PM-565, to arrive at the claimed invention. RX-0984C at Q/A 160. When considering options to design a scraper blade, a POSITA would readily recognize that the design choice presented in Overton deals with the same functionality required to pivot the scraper blade open. *Id.* Therefore, for these

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reasons, PM-565 combined with Overton renders this limitation obvious.

Id. at 31.

Wirtgen argues, in part:

For at least the reasons discussed earlier with respect to the PM565 machine by itself, this combination does not disclose or render obvious this feature. CX-0007C (Meyer Rebuttal WS) Q140. Furthermore, Dr. Fronczak's proposed modification would not protect the cylinder, in direct contravention of his purported motivation to combine. *See supra* VII(C)(1)(4).

Wirtgen Br. at 68. Wirtgen also argues that Overton is not analogous art and "is not prior art properly combinable" with the PM-565. *Id.*

Having considered the parties' arguments, the administrative law judge has determined that the PM-565 and Overton collectively teach a construction machine with a swiveling actuator that, *inter alia*, can extend, as element [1.5] requires. *See* RX-0984C (Fronczak WS) at Q/A 160. In particular, at a minimum, it is undisputed that Overton teaches an actuator that extends to open a door. *Id.*

The administrative law judge has also determined that Overton is analogous art, as discussed above in relation to the MP 1300 and Overton combination. *See* Part V(F)(1), *supra*.

The administrative law judge has determined, however, that neither Caterpillar nor Dr. Fronczak has provided a sufficient rationale to explain why a person of ordinary skill in the art would modify the PM-565 in view of Overton, based on the same reasons discussed above in relation to the MP 1300 and Overton combination. *See* Part V(F)(1), *supra*.

2. Claim 4

Caterpillar argues:

PM-565 combined with Overton also renders claim 4 obvious. Overton discloses a swiveling actuator pivotally connected at a

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pivotal axis lower in height than the swiveling axis. RX-0007 at Fig. 1. As discussed above, a POSITA would have been motivated to combine Overton with PM-565 to use an extending swiveling actuator to operate the scraper blade. RX-0984C at Q/A 164. Wirtgen's arguments that this analysis "omits any discussion of where or how the machine-side end of the alleged swiveling actuator would be connected" are misplaced. See CX-0007C (Meyer Rebuttal WS) at Q/A 101-102. An obviousness analysis does not require an instruction manual on how to physically incorporate or combine references; it only requires analyzing "whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole." *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (en banc). Here, Dr. Fronczak has presented clear and un rebutted testimony that a POSITA would have known how to make the modification to use Overton's extending cylinder in the PM-565. Tr. (Fronczak) at 521:2-522:17. Therefore, PM-565 combined with Overton also renders also claim 4 obvious. *Id.*

Caterpillar Br. at 32-33.

Wirtgen replies:

Claim 4 includes all the limitation of claim 1, and is therefore nonobvious at least because the swiveling actuator limitation of claim 1 is not disclosed in the prior art. Claim 4 goes on to recite the additional limitation that the swiveling actuator has a "pivotal axis lower in height than the swiveling axis." That limitation is also absent from the proposed prior art combination.

Because Caterpillar cannot dispute that the PM-565 did not include an actuator configured according to claim 4, it argues that a POSA would have found it obvious to modify the PM-565 to change the vertical relationship between the pivotal and swiveling axes. Cat. PH Br. at 32-33. And again, Caterpillar points to Overton, a completely different kind of machine with a swiveling actuator mounted in a different location serving a different purpose. Not only would a POSA have no reason to look to the actuator of Overton when modifying the PM-565 actuator, Hearing Tr. 272:2-9 (Meyer), but a POSA would have no motivation to modify the PM-565 to change both the line of action of the actuator and the vertical offset of its connection to the scraper blade relative to the swiveling axis. CX-0007C (Meyer Rebuttal WS) Q112.

Wirtgen Reply at 16-17.

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The administrative law judge has determined that the PM-565 and Overton collectively teach the subject matter of claim 4. *See* RX-0984C (Fronczak WS) at Q/A 164. The portion of the transcript that Wirtgen cites deals with analogous art, *see* Meyer Tr. 272, not what the PM-565 and Overton teach. So, this does not rebut Dr. Fronczak's testimony. Additionally, CX-0007C (Meyer RWS) at Q/A 112 relates to claim 5 and the MP 1300, and thus does not rebut Dr. Fronczak's testimony.

However, the administrative law judge previously determined that neither Caterpillar nor Dr. Fronczak has provided a sufficient rationale to explain why a person of ordinary skill in the art would modify the PM-565 in view of Overton (based on the same reasons discussed above in relation to the MP 1300 and Overton combination). *See* Part V(F)(1), *supra*. Thus, Caterpillar has not shown that claim 4 would have been obvious based on the PM-565 and Overton.

3. Claim 9

Caterpillar mentions Overton in passing for elements [9.7] and [9.8]. *See* Caterpillar Br. at 36. Dr. Fronczak's testimony about these elements does not contain any citations to Overton. *See* RX-0984C (Fronczak WS) at Q/A 183-86. Accordingly, the administrative law judge has determined that Caterpillar has not shown that claim 9 specifically would have been obvious over the PM-565 in view of Overton.

4. Claim 12

Caterpillar mentions Overton in passing for claim 12. *See* Caterpillar Br. at 36. Dr. Fronczak's testimony about claim 12 does not contain any citations to Overton. *See* RX-0984C (Fronczak WS) at Q/A 188-90. Accordingly, the administrative law judge has determined that Caterpillar has not shown that claim 12 specifically would have been obvious over the PM-565 in view of Overton.

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I. Obviousness – “combination of the PM-565 with MP 1300”

Caterpillar’s entire argument is:

The combination of the PM-565 with MP 1300 also renders the asserted claims obvious. *See* RX-0984C at Q/A 161. Both references disclose milling machines having many of the same basic components; a machine frame, a rotor, and a two-part scraper blade that can be raised to give access to the rotor. *Id.* A POSITA designing components of a milling machine would look to other machines of the same type; therefore, PM-565 and MP 1300 are analogous art. *Id.*

As described above, MP 1300 discloses all the limitations of claim 1. A POSITA would have found it obvious to try using the swiveling actuator of MP 1300 with the scraper blade of PM-565. RX-0984C at Q/A 161. Any change between the four mounting configurations of the swiveling actuator represents a choice from a finite number of identified, predictable solutions that would yield a reasonable expectation of success. *Id.* Thus, it would have been an obvious design choice to move the attachment of the swiveling actuator from behind to in front of the scraper blade, and respectively use an extending actuator, rather than a retracting actuator to provide the same torque or moment to the scraper blade to pivot the scraper blade up. *Id.* As described in detail above, changing the configuration of the scraper blade to have an extending swiveling actuator located forward of the milling drum and below the swiveling axis would lead to each of asserted claims 4, 5, 9, and 12 being satisfied. Therefore, the combination of PM-565 and MP 1300 render all of these claims obvious by clear and convincing evidence.

Caterpillar Br. at 51-52.

The administrative law judge has determined that Caterpillar has not shown, through clear and convincing evidence, that claims asserted claims 4, 5, 9, and 12 would have been obvious based on the evidence it cites. In particular, RX-0984C (Fronczak WS) at Q/A 161 only addresses claim 1. Further, the testimony presents a variant of the same flawed obvious-to-try argument that Caterpillar presented for the MP 1300. *Id.* (Dr. Fronczak opines that it was “obvious to try using the swiveling actuator of MP 1300 with the scraper blade of PM-565”).

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J. Obviousness – Secondary Considerations

Wirtgen argues that evidence of copying, commercial success, and the praise of others indicates that the '340 Patent would not have been obvious. *See* Wirtgen Br. at 71-78.

Caterpillar argues that Wirtgen's secondary considerations arguments "are unsupported by the evidence, and do not overcome the strong showing of obviousness[.]" Caterpillar Br. at 52.

1. Copying

Wirtgen argues that Caterpillar copied Wirtgen's "patented feature" scraper door. Wirtgen Br. at 71. Wirtgen's copying allegations are largely cumulative to the copying allegations it presented for the other asserted patents. *See id.* at 71-75.

Caterpillar argues that Wirtgen actually copied its two-part scraper blade and that Caterpillar is not to blame because "it is common—indeed expected—in the industry for companies to observe, inspect, purchase, and even tear down products made by competitors." Caterpillar Br. at 52-53.

Wirtgen replies, in part:

Caterpillar first tries to refute Wirtgen America's allegations of copying by alleging that it, and not Wirtgen, was the first to invent the two-part scraper blade. Cat. PH Br. at 52. Caterpillar's argument mischaracterizes the invention. The patentees submitted photographs of a Caterpillar two-part scraper during prosecution of the application leading to the '340 patent. The patentees then distinguished their invention from the prior-art Caterpillar two-part scraper blade on the basis of their actuator configuration. Caterpillar copied that improved configuration.

Wirtgen Reply at 23.

The administrative law judge has determined that Wirtgen has presented some evidence of copying. The evidence shows that Caterpillar [

]. Clark Tr.

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631-634. The documentary evidence also shows that Caterpillar [

J. *See* CX-0564C (CPLN Trade-Off Kick-Off) at 107; Engelmann Tr. 687-688; CX-0568C (PM600 Hydraulics Presentation) at 3, 5; CX-0307C (NPI Manual) at 47. Wirtgen, however, does not cite evidence that is directly related to the scraper door. *See* Wirtgen Br. at 71-75 (the evidence relates to generalized copying allegations). For example, Wirtgen's argument that "[

]—does not explain how or in what respect Caterpillar supposedly copied the scraper door.

2. Commercial Success

Wirtgen argues that its "DI milling machines are commercial embodiments of the '340 patent's claims" and that the "features at issue in the '340 patent not only resulted in improved milling machine performance, but also, these features drove sales of milling machines" Wirtgen Br. at 75 (citing, *inter alia*, CX-0009C (Mulhern RWS) at Q/A 13, 19, 37).

The evidence does not show that any of Wirtgen's products were a commercial success vis-à-vis the '340 Patent. To support its commercial success argument, Wirtgen points to sales of its DI products since 2014. CX-0009C (Mulhern RWS) at Q/A 18-19 (identifying [] machine sales totaling [] million in revenue). For the '340 Patent, Ms. Mulhern identifies [] machine sales, which totaled [] million in revenue. *Id.* at Q/A 19. Caterpillar does not dispute the significance of the sales volume and revenue. *See* Caterpillar Br. at 56-57.

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Wirtgen, however, has not demonstrated that the alleged success is attributable to any feature(s) claimed in the '340 Patent.⁸⁴ While Wirtgen cites CX-0007 (Meyer RWS) at Q/A 203 as evidence that the scraper door allows for “faster chang[ing] of bits on the drum,” this statement is unsupported, and it is not clear that this supposed benefit drove customer demand.⁸⁵ Likewise, Wirtgen refers to its marketing materials that supposedly tout the features of the '340 Patent, but it does not cite to the documents themselves. *See* Wirtgen Br. at 76 (citing CX-0002C (Schmidt WS) at Q/A 9-10, 14-15, 104; CX-0009C (Mulhern RWS) Q/A 48). Wirtgen's witnesses also fail to point to relevant marketing documents. *See, e.g.,* CX-0002C (Schmidt WS) at Q/A 9-10, 14-15, 104; CX-0009C (Mulhern RWS) Q/A 48. Similarly, Wirtgen's argument that the '340 Patent alleviates top-heaviness, *see* CX-0007C (Meyer RWS) at Q/A 206, is tenuous because Wirtgen's expert comingled all of “the features-at-issue in this investigation” in his response. Accordingly, Wirtgen has not shown that the products were commercially successful due to the scraper door claimed in the '340 Patent.

⁸⁴ Wirtgen has argued it is entitled to a presumption on nexus. *See* Wirtgen Br. at 197 (addressing the '641 Patent). However, the very authority it cites, *WBIP v. Kohler*, says that there is no presumption “where the patented invention is only a component of the product to which the asserted objective considerations are tied.” *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1329 (Fed. Cir. 2016). Because the scraper door is a component of the machine, and is not coextensive with the machine, Wirtgen is not entitled to a nexus presumption.

⁸⁵ Further, Mr. McEvoy, Wirtgen America's CEO, testified that customers buy Wirtgen products because its machines include a “number of” features and because of Wirtgen America's (claimed) superior product support. *See* CX-0003C (McEvoy WS) at Q/A 25 (testifying that customers buy Wirtgen products because “. . . Second, Wirtgen America's product support is the best in the industry.”); *see also* CX-0008C (Mulhern WS) at Q/A 102 (discussing 23,500 technical support calls received since 2014); CX-0002C (Schmidt WS) at Q/A 69 (explaining that Wirtgen's technical support is available 24 hours a day, seven days a week and that “As soon as Wirtgen America receives a communication from a customer, the technical staff put the wheels in motion to address the issue.”); RX-0989C (Reed RWS) at Q/A 150 (Wirtgen has been the leading supplier of milling equipment for decades.”), Q/A 155-56 (“Ms. Mulhern has not shown a temporal link between sales growth and the patented features.”).

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3. Industry Acclaim and Praise of Others

Wirtgen's entire argument is:

The '340 patent is a prominent example of the user-friendly technology for which Wirtgen America has received widespread recognition from its customers and others in the industry. CX-0007C (Meyer Rebuttal WS) Q207. For example, Heavy Equipment Guide interviewed several Wirtgen customers in an article titled, "Milling service provider turns to Wirtgen for premium equipment," published June 13, 2017. CX-0007C (Meyer Rebuttal WS) Q208. The article states, "[Wirtgen machines] are clearly much more user-friendly than other machines," says Cook with conviction." CX-0495C.0003 (Heavy Equipment Guide Article). CX-0007C (Meyer Rebuttal WS) Q208-209.

Wirtgen Br. at 77-78.

The testimony and evidence that Wirtgen cites is not related to the scraper door. The sentences immediately following the "user-friendly" accolade discusses error messages and machine noise. *See* CX-0495C at 3. The next four paragraphs discuss reduced odor, ergonomics, lighting, and a camera system. *Id.* Wirtgen has failed to show that others praised the scraper door claimed by the '340 Patent.

4. Weighing the Secondary Considerations

On the whole, the administrative law judge has determined that the secondary considerations do not provide a material rebuttal to Caterpillar's obviousness argument. In particular, the evidence of copying is modest, the sales data that Wirtgen cites lacks a nexus to the '340 Patent, and the industry-praise evidence that Wirtgen cites does not relate to the scraper door.

VII. U.S. Patent No. 9,656,530

A. Overview of the '530 Patent (JX-0003)

The '530 Patent, entitled "Automotive construction machine, as well as lifting column for a construction machine," issued on May 23, 2017. The application that would issue as the '340

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Patent, Application No. 14/683,273 (the “‘273 application”), was filed on April 10, 2015. The ‘273 application claims priority to several applications; the application with the earliest filing date is German Application No. DE 10 2005 043 531, which was filed on September 12, 2005. In general, the ‘530 Patent concerns the lifting columns, or legs, that are used to raise or lower a construction machine. *See generally* JX-0003 at Abstract. The columns are equipped with sensors that relay position information to a controller that uses the information to regulate the lifting position of the columns and the vertical depth (*e.g.*, the height) of the drum. *Id.* at 2:20-55, 4:47-51.

Wirtgen asserts claims 2, 5, 16, and 23. Wirtgen Br. at 80-103. Claims 1, 2, 5, 16, and 22, 23 are reproduced below:

1. A road construction machine, comprising:
 - a machine frame;
 - a working drum supported from the machine frame for working a ground surface or traffic surface;
 - a plurality of ground engaging supports for supporting the construction machine on the ground surface or traffic surface;
 - a plurality of lifting columns, each one of the lifting columns being connected between the machine frame and one of the ground engaging supports, each one of the lifting columns including two telescoping hollow column members and at least one piston cylinder unit located within the telescoping hollow column members for adjusting a height of the lifting column so that each one of the lifting columns is adjustable in height relative to the machine frame, each lifting column having a lifting position corresponding to a position of one of the two telescoping hollow column members relative to the other of the two telescoping hollow column members; and
 - a plurality of lifting position sensors, each lifting position sensor being coupled with elements of one of the lifting columns, which elements are capable of being displaced relative to one another in accordance with the lifting position of the lifting column in such a manner that a signal including information on a current

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lifting position of the lifting column is produced by the lifting position sensor, wherein each of the lifting position sensors is connected to the at least one piston cylinder unit located within its associated lifting column.

* * *

2. The road construction machine of claim 1, further comprising:

a controller configured to receive the signals from the lifting position sensors, and to regulate the lifting positions of the lifting columns in response at least in part to the signals from the lifting position sensors.

* * *

5. The road construction machine of claim 2, wherein:

the controller is configured to provide at least one limiting value for the height adjustment of each of the lifting columns.

* * *

16. The road construction machine of claim 2, wherein:

the controller is configured to raise the lifting columns synchronously to one another.

* * *

22. The road construction machine of claim 1, further comprising:

an indicator device operable to display the lifting positions of each of the lifting columns corresponding to the signals produced by the lifting position sensors.

* * *

23. The road construction machine of claim 22, wherein:

the plurality of lifting columns includes two front lifting columns and two rear lifting columns; and

the indicator device is operable to display the lifting positions of the two front lifting columns and two rear lifting columns.

JX-0003 at 7:51-9:55.

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B. Claim Construction

1. Level of Ordinary Skill in the Art

For all of the asserted patents, Wirtgen argues:

Wirtgen America submits that a person of ordinary skill in the art as of the filing dates of the Asserted Patents is one who has either: (1) a bachelor's degree (or equivalent) in mechanical engineering or a similar field, and two to five years of experience working on mobile construction machine design or in a similar field; or (2) seven to ten years of experience working on mobile construction machine design or in a similar field. Caterpillar similarly contends that a person of ordinary skill in the art would have either: (1) a bachelor's degree in mechanical engineering or an equivalent degree, and two to five years of experience working on mobile construction machine design, or (2) seven to ten years of experience working on mobile construction machine design. Accordingly, the parties have effectively no dispute over the level of ordinary skill in the art.

Wirtgen Br. at 25.

Caterpillar argues:

A person of ordinary skill in the art at the time of the alleged invention in the '530 patent would have had: 1) a bachelor's degree in mechanical engineering or an equivalent degree, and two to five years of experience working on mobile construction machine design, or machines of comparable complexity; or 2) seven to ten years of experience working on mobile construction machine design. RX-0985C at Q/A 60 (Alleyne Direct Witness Statement). Wirtgen's proposed level of skill in the art for the '530 patent is not materially different, and neither party has argued that the outcome of this case depends on which party's POSITA definition is adopted.

Caterpillar Br. at 75-76. Caterpillar proposes the same level of ordinary skill for the '340, '641, and '309 Patents. *Id.* at 20 (addressing the '340 Patent), 152 (addressing the '641 Patent), 229 (addressing the '309 Patent).

As discussed above with respect to the '309 Patent, the administrative law judge has determined that a person of ordinary skill in the art would have (1) a bachelor's degree (or equivalent) in mechanical engineering or a similar field, and two to five years of experience

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working on mobile construction machine design or in a similar field or (2) seven to ten years of experience working on mobile construction machine design. *See* CX-0006C (Meyer WS) at Q/A 31; RX-0985C (Alleyne WS) at Q/A 60; *see also* Part IV(B)(1), *supra*.

2. Agreed Construction

The parties agree that the phrase “each lifting position sensor being coupled with elements of one of the lifting columns, which elements are capable of being displaced relative to one another in accordance with the lifting position of the lifting column in such a manner that a signal including information on a current lifting position of the lifting column is produced by the lifting position sensor,” which appears in claim 1, should be afforded its plain and ordinary meaning. Caterpillar Br. at 77. The parties agree that the plain and ordinary meaning is “each lifting position sensor is coupled to two or more components within its respective lifting column, these components are capable of being displaced relative to one another such that their displacement reflects the lifting position of the lifting column, the lifting position sensor generates a signal that contains information about the lifting position of the column based on the displacement of the components.” *Id.*

3. Disputed Construction

The parties dispute whether the “controller” term, which appears in claims 2, 4, 5, 8-10, 13-19, 24, and 25 (dependent claims not including “controller” are omitted) should be construed as a means-plus-function term. *See* Wirtgen Initial Claim Construction Br. at 22; Caterpillar Initial Claim Construction Br. at 31-32. Wirtgen separately addresses the term “controller” and the phrase “a controller configured to receive the signals from the lifting position sensors, and to regulate the lifting positions of the lifting columns in response at least in part to the signals from the lifting position sensors” (which is the substance of claim 2). *See* Wirtgen Initial Claim

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Construction Br. at 22-28. Caterpillar presents its “controller” argument within the context of claim 2, which contains the “controller configured to” language. Caterpillar Br. at 76; JX-0003 at 8:14-20.

The parties propose the following constructions:

Wirtgen’s Proposed Construction	Caterpillar’s Proposed Construction
<p>Wirtgen does not clearly present a construction for the “controller” term in its briefing.</p> <p>For claim 2, Wirtgen argues the disputed phrase should receive its plain meaning, which is “a controller that is configured to receive signals from the lifting position sensors and to raise, lower, or maintain the lifting positions of the lifting columns at least partly in response to those signals”</p>	<p>This is a means-plus-function limitation. <i>See Williamson v. Citrix Online, LLC</i>, 792 F.3d 1339 (Fed. Cir. 2015).</p> <p><u>Function</u>: to receive the signals from the lifting position sensors, and to regulate the lifting positions of the lifting columns in response at least in part to the signals from the lifting position sensors.</p> <p><u>Corresponding Structure</u>: No algorithm, circuit, or other structure is disclosed for performing the claimed function; therefore, the claim is indefinite.</p>

See Wirtgen Initial Claim Construction Br. at 22-28; Caterpillar Br. at 153.

For the “controller” term, Wirtgen argues that a “controller is a structure” and that “the word ‘controller’ nonetheless denotes a well-known class of structures.” Wirtgen Initial Claim Construction Br. at 22-23. Wirtgen argues:

For example, single-board controllers and programmable-logic controllers (commonly referred to as PLC in the industry) are controllers routinely used in construction machines. Such controllers have a well-known physical form. Velinsky at ¶¶53-56. A person of ordinary skill in the art in mechanical engineering would know that a controller is a structure that includes an analog or digital input, an analog or digital output, a programming interface or input, a processor, and a memory, even though the ‘530 patent does not expressly recite those features. This is no different than when an ordinarily-skilled carpenter reads the term “screwdriver” and knows that structure to have a handle, a shaft, and a Phillips or flat head, even if those features were not expressly recited. Velinsky at ¶56. Additionally, a person of skill in the art would know that controllers

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might also include an analog-to-digital or digital-to-analog converter, standard firmware, and a power input or an integrated power supply. Velinsky at ¶56. As such, the term “controller” has a reasonably well-understood meaning in the mechanical engineering field. Velinsky at ¶53.

Id. at 23. Wirtgen then turns to the ‘530 Patent:

In this case, a person of ordinary skill in the art would understand the claimed controller’s structure in view of the patent’s depiction of the controller’s configuration and interaction with the other components of the machine. For example, the patent describes the controller’s functions as receiving signals from the sensors and regulating the movements of the components coupled to the sensors. ‘530 patent 6:38-55; Velinsky at ¶¶ 52, 54. In view of the patent’s figures, one of ordinary skill in the art would understand that the controller is an electronic component of the type commonly used in the industry. The figures depict the controller that performs these tasks as the object with reference number 23. Controller 23 receives signals from sensors 21 and uses the position measurement information in those signals to regulate the heights of the lifting columns 14. *See* ‘530 patent 1:20-23 (controller raises or lowers the lifting columns); 3:65-4:24 (describing embodiments of regulating the lifting positions in response to signals). Given that context, one of ordinary skill in the art would know that controller 23 is an electronic component of the type commonly used in the industry, such as a single-board controller or a PLC controller. Velinsky at ¶55.

Id. at 25.

In discussing claim 2, Wirtgen argues that the controller “is a standard electronic controller[.]” Wirtgen Initial Claim Construction Br. at 26. Wirtgen argues that “person of ordinary skill in the art having read the specification would know how to select a controller capable of performing the functions recited in claim 2 and how to configure that controller in the context of the recited milling machine[.]” *Id.* at 27. Wirtgen concludes that “the term is neither governed by § 112 ¶ 6 nor is it indefinite.” *Id.* at 28.

Caterpillar argues that the term controller and the disputed phrase (essentially the entirety of claim 2) invoke § 112(6). Caterpillar Initial Claim Construction Br. at 32-34. Caterpillar

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analogizes claim 2 to cases finding various “controller” terms functionally claimed. *Id.*

Caterpillar then argues that the term is indefinite because the ‘530 Patent does not, in its view, disclose sufficient structure and an algorithm to implement the claimed function. *Id.* at 34-38.

Having considered the parties’ arguments, the administrative law judge construes the term “controller” to mean “a standard electronic controller” such as a single-board controller or a PLC controller available at the time of the patent. Nothing in the claims or the specification suggest that the controller is a particularized piece of hardware—the claims do not require unique hardware performance requirements, unique physical structures, or complex algorithms to enable the machine. Further, Wirtgen’s expert testified that “a person of ordinary skill in the art would understand that the term controller denotes a well-known class of structures.” *See* CX-0005C (Lumkes RWS) at Q/A 266 (approving of the Velinsky Declaration) (The “controller” “refers to a well-known class of electrical components in the context of construction machine design, and that controllers have a standard physical form.”). Likewise, Caterpillar’s obviousness arguments contend that “controllers” were well-known in 2005. *See* Caterpillar Br. at 106 (“Indeed, by September 2005, there were already several “off-the-shelf” control systems that were well known and used for providing automatic height correction without the need for manual operator control, including systems from MOBA and Topcon.”); *see also* Caterpillar Reply at 30 (“Wirtgen does not dispute that in 2005, it was a well-known feature of most controllers that two or more of the machine’s legs could be raised simultaneously by the operator.”). Indeed, Caterpillar points to controllers in the RX-500, the PM-465, Davis, MOBA, and Topcon.⁸⁶ *Id.* Accordingly, the administrative law judge finds that a “controller” refers to a

⁸⁶ The Hosseini reference, RX-0024, which issued as U.S. Patent No. 5,189,940 in 1993, also discloses a controller. *See* RX-0024, Figs. 3-5. Hosseini was assigned to Caterpillar.

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standard controller, such as a PLC (programmable logic controller), and that the term “controller” is not functionally claimed.⁸⁷

C. Infringement

Wirtgen argues that Caterpillar’s PM622, PM820, PM822, and PM825 road milling machines directly infringe claims 2, 5, 16, and 23 of the ‘530 Patent. Wirtgen Br. at 80. Wirtgen does not argue indirect infringement or infringement under the doctrine of equivalents. *See generally id.* at 80-95.

1. Claim 1

For its infringement analysis, Wirtgen divides claim 1 into nine limitations, as follows:

- 1[p] 1. A road construction machine, comprising:
 - 1[a] a machine frame;
 - 1[b] a working drum supported from the machine frame for working a ground surface or traffic surface;
 - 1[c] a plurality of ground engaging supports for supporting the construction machine on the ground surface or traffic surface;
 - 1[d] a plurality of lifting columns, each one of the lifting columns being connected between the machine frame and one of the ground engaging supports,
 - 1[e] each one of the lifting columns including two telescoping hollow column members and at least one piston cylinder unit located within the telescoping hollow column members for adjusting a height of the lifting column so that each one of the lifting columns is adjustable in height relative to the machine frame,
 - 1[f] each lifting column having a lifting position corresponding to a position of one of the two telescoping hollow column members relative to the other of the two telescoping hollow column members; and

⁸⁷ The “controller” of the ‘530 Patent differs from the controller claimed in the ‘641 Patent given the different specifications and respective usage of the term “controller” in each patent.

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1[g] a plurality of lifting position sensors, each lifting position sensor being coupled with elements of one of the lifting columns, which elements are capable of being displaced relative to one another in accordance with the lifting position of the lifting column in such a manner that a signal including information on a current lifting position of the lifting column is produced by the lifting position sensor,

1[h] wherein each of the lifting position sensors is connected to the at least one piston cylinder unit located within its associated lifting column.

See CDX-0001C (Lumkes Demonstratives) at 13-25; JX-0003 at 7:51-8:13. Each limitation is addressed below.

a) 1[p] 1. A road construction machine

Wirtgen argues “the PM620 is a cold milling machine, which is Caterpillar refers to as a cold planer . . . A cold milling machine is a road construction machine as stated in the preamble.” Wirtgen Br. at 81.

Caterpillar does not clearly rebut this argument. See generally Caterpillar Br. at 145-47 (Caterpillar disputes limitation 1[g] only); Caterpillar Reply at 41-42 (same).

The evidence shows that the PM620 is a cold milling machine, which is a road construction machine. See CX-0004C (Lumkes WS) at Q/A 91-92; CX-0059C (PM620 Operations Manual) at 35. Accordingly, the administrative law judge has determined that the PM620 is a road construction machine as described in the preamble.

b) 1[a] a machine frame

Wirtgen argues that the “PM620 includes a machine frame as recited in element 1[a].” Wirtgen Br. at 81.

Caterpillar does not clearly rebut this argument. See generally Caterpillar Br. at 145-47 (Caterpillar disputes limitation 1[g] only); Caterpillar Reply at 41-42 (same).

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The evidence shows that the PM620 includes a machine frame. *See* CX-0004C (Lumkes WS) at Q/A 93-94; CX-0061C (PM620 Parts Manual) at 503. Accordingly, the administrative law judge has determined that the PM620 includes a machine frame, as limitation 1[a] requires.

c) *1[b] a working drum supported from the machine frame for working a ground surface or traffic surface*

Wirtgen argues that the PM620 includes a rotor, which is the name used to describe a working drum (which may also be called a milling drum). *See* Wirtgen Br. at 81-82.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 145-47 (Caterpillar disputes limitation 1[g] only); Caterpillar Reply at 41-42 (same).

The evidence shows that the PM620 includes a milling drum, which works ground surfaces, that is supported from the frame. *See* CX-0004C (Lumkes WS) at Q/A 95-97; CX-0061C (PM620 Parts Manual) at 744. Accordingly, the administrative law judge has determined that the PM620 includes the working drum described in limitation 1[b].

d) *1[c] a plurality of ground engaging supports for supporting the construction machine on the ground surface or traffic surface*

Wirtgen argues that the PM620 includes four tracks that are the ground-engaging supports. *See* Wirtgen Br. at 82.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 145-47 (Caterpillar disputes limitation 1[g] only); Caterpillar Reply at 41-42 (same).

The evidence shows that the PM620 includes four tracks that support the machine. *See* CX-0004C (Lumkes WS) at Q/A 98-99. Accordingly, the administrative law judge has determined that the PM620 includes the plurality of ground-engaging supports described in limitation 1[c].

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- e) *1[d] a plurality of lifting columns, each one of the lifting columns being connected between the machine frame and one of the ground engaging supports*

Wirtgen argues that the PM620 “includes four height-adjustable legs at each corner of the machine, which constitute the plurality of lifting columns recited in element 1[d].” Wirtgen Br. at 83-84.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 145-47 (Caterpillar disputes limitation 1[g] only); Caterpillar Reply at 41-42 (same).

The evidence shows that the PM620 includes four height-adjustable legs that include lifting columns and that the lifting columns are connected between the machine frame and a track. *See* CX-0004C (Lumkes WS) at Q/A 100-06. Accordingly, the administrative law judge has determined that the PM620 includes the plurality of lifting columns described in limitation 1[d].

- f) *1[e] each one of the lifting columns including two telescoping hollow column members and at least one piston cylinder unit located within the telescoping hollow column members for adjusting a height of the lifting column so that each one of the lifting columns is adjustable in height relative to the machine frame*

Wirtgen argues that the PM620’s legs satisfy limitation 1[e]:

... Each PM620 leg includes a lower undercarriage support (*i.e.*, a first telescoping hollow column member) and an upper tubular member connected to the machine frame (*i.e.*, a second telescoping hollow column member).

[

– Figure omitted –

]

CX-0061C.0531, C.544 (PM620 Parts Manual)[.] . . . The upper tubular members on the machine frame receive the lower tubular member of the PM620's undercarriage support. CX-0004C Q107 (Lumkes Opening WS); CDX-0001C.0020-21 (Lumkes Direct Demonstrative). These tubular members constitute the recited two telescoping hollow column members in element 1[e].

As shown in CX-0061C.0558 (PM620 Parts Manual), each PM620 leg also includes a hydraulic cylinder, which is a piston cylinder unit as recited in claim 1, that extends from the top of the leg's upper tubular member on the machine frame to the lower undercarriage supports. . . . The hydraulic cylinder is positioned within the upper and lower tubular members. CX-0004C Q111 (Lumkes Opening WS). The hydraulic cylinder within each leg extends or retracts such that the respective leg's hollow tubular members telescope relative to one another, which allows for individual adjustment in height of the lifting columns relative to the machine frame. CX-0004C Q112 (Lumkes Opening WS).

Wirtgen Br. at 84-85.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 145-47 (Caterpillar disputes limitation 1[g] only); Caterpillar Reply at 41-42 (same).

The evidence shows that each of the PM620's lifting columns includes two telescoping, hollow columns that house a piston cylinder. The piston cylinder in each lifting column can adjust the height of the column such that each of the PM620's legs is adjustable relative to the

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machine frame. See CX-0004C (Lumkes WS) at Q/A 107-12. Accordingly, the administrative law judge has determined that the PM620's lifting columns include the two telescoping columns and the piston cylinder in limitation 1[e].

- g) *1[f] each lifting column having a lifting position corresponding to a position of one of the two telescoping hollow column members relative to the other of the two telescoping hollow column members*

Wirtgen argues:

... the hydraulic cylinder within each PM620 leg extends or retracts such that the respective leg's hollow tubular members telescope relative to one another. CX-0004C Q113 (Lumkes Opening WS); CPX-0080C (PM620 Video Raising & Lowering). The relative position between the telescoping hollow tubular members defines a lifting position of the lifting column—the machine legs extend and retract by relative movement of the PM620 hollow tubular members. CX-0004C Q112-113 (Lumkes Opening WS); CPX-0081C (PM620 Video Raising & Lowering 2).

Wirtgen Br. at 85.

Caterpillar does not clearly rebut this argument. See generally Caterpillar Br. at 145-47 (Caterpillar disputes limitation 1[g] only); Caterpillar Reply at 41-42 (same).

The evidence shows that each of the PM620's lifting columns have a lifting position that corresponds to the relative positions of the two telescoping, hollow columns. See CX-0004C (Lumkes WS) at Q/A 113 ("The hydraulic cylinder within each PM620 leg extends or retracts such that the respective leg's hollow tubular members telescope relative to one another.").⁸⁸

⁸⁸ When arguing that claim 1 is obvious over the Roadtec RX-500, Caterpillar argued that the RX-500 discloses this limitation because, *inter alia*, "the piston cylinder unit in each leg tube column of the machine extends and retracts, which causes the lifting columns to move" and because the "movement of the piston cylinder unit relative to these tubular members allows the lifting columns to take on particular lifting positions." Caterpillar Br. at 87.

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Accordingly, the administrative law judge has determined that the PM620's lifting columns have the lifting position described in limitation 1[f].

- h) 1[g] a plurality of lifting position sensors, each lifting position sensor being coupled with elements of one of the lifting columns, which elements are capable of being displaced relative to one another in accordance with the lifting position of the lifting column in such a manner that a signal including information on a current lifting position of the lifting column is produced by the lifting position sensor***

Wirtgen argues:

Referencing the below annotated part drawing of a PM620 leg cylinder (CX-0061C.0569 (PM620 Parts Manual)), the lifting position sensor of the PM620 leg cylinder includes [

].

[

– Figure omitted –

]

CX-0004C Q115 (Lumkes Opening WS) (referencing CX-0061C.0569 (PM620 Parts Manual) (annotated)). The [

] fixed to the top of the hydraulic cylinder (shaded in green), and the [] is connected to the cylinder's movable rod (shaded in yellow). *Id.* The rod can be displaced relative to the top of the cylinder, which changes the lifting position of the respective lifting column. Thus, the PM620 [

]. *Id.* The sensor, [

]. CX-0004C Q101 (Lumkes Opening WS); *see also* CX-0591C.0241, .0192, .0164, .0011 (PM600 Technical Presentation).

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Specifically, each PM620 position [] CX-0004C Q117 (Lumkes Opening WS); CX-0591C.0241 (PM600 Technical Presentation); Hearing Tr. 824:2-10 (Alleyne). The [] form the sensor that measures the leg position. CX-0004C Q118 (Lumkes Opening WS). Caterpillar does not dispute how the PM620's leg sensors work, or whether their functionality is described in the '530 specification as examples of the claimed leg positions sensors. Rather, Caterpillar argues that [] That argument ignores the realities of the position sensing system, and well-understood nomenclature for [] sensors. CX-0004C Q1201 (Lumkes Opening WS) (explaining that one of ordinary skill in the art would understand that the combination of the [] constitute a "sensor," as recited in claim 1); Hearing Tr. 829:12-831:25 (Alleyne) (conceding that the leading supplier of []). There is therefore no reasonable dispute that the PM620 includes a lifting position sensor as claimed in element 1[g].

Wirtgen Br. at 86-87.

Caterpillar argues that it does not infringe because its []

]” (and not the lifting

column). Caterpillar Br. at 145. Caterpillar adds that “[

]” *Id.* at 146.

Wirtgen replies that the “the entire apparatus ([] collectively referred to as a sensor, regardless of the nomenclature used for the component parts.” Wirtgen Reply at 26.

Caterpillar replies that the [] are different parts, as shown by its part numbering system and the testimony of a Caterpillar engineer who characterized the [] See Caterpillar Reply at 41-42. Caterpillar refers to

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[]” without providing any explanation of the sensor or how it works. *Id.* at 42.

Having considered the parties’ arguments, the administrative law judge has determined that the PM620’s leg cylinder’s lifting position sensor—[

]—constitute the lifting position sensors recited in limitation 1[g]. *See* CX-0004C (Lumkes WS) at Q/A 115; CDX-0001C (annotating CX-0061C (PM620 Parts Manual) at 569) at 24. [] (annotated in red on CDX-0001C at 24) is coupled to [

]. *Id.* The [] PM620’s cylinder. *See* CX-0061C (PM620 Parts Manual) at 569; CX-0004C (Lumkes WS) at Q/A 115-20. The [

]. *Id.* Caterpillar’s non-infringement argument, which is driven by the names given to the components of the machine rather than how the components operate, adds unnecessary requirements to the limitation. Further, even if the [

]. Accordingly, the administrative law judge has determined that the PM620 includes the lifting position sensors described in limitation 1[g].

- i) ***1[h] wherein each of the lifting position sensors is connected to the at least one piston cylinder unit located within its associated lifting column.***

Wirtgen argues:

The hydraulic cylinders within the PM620 legs satisfy element 1[h]. CX-0004C Q121 (Lumkes Opening WS); CX-0061C.0558, .0559 (PM620 Parts Manual); *see also* CX-0591C.0192, .0164, .0011 (PM600 Technical Presentation). The PM620 includes lifting cylinders in each lifting column. CX-0004C Q121 (Lumkes Opening WS); CX-0061C.0558 (PM620 Parts Manual) (showing a

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cylinder in each leg). And again, each of these cylinders includes []. CX-0004C Q121 (Lumkes Opening WS); CX-0061C.0559 (PM620 Parts Manual); *see also* CX-0004C Q114-120 (Lumkes Opening WS); CX-0061C.0559 (PM620 Parts Manual); CX-0591C.0192, .0164, .0011 (PM600 Technical Presentation). Thus, each lifting position sensor is connected to a cylinder located within its associated lifting column, as recited in element 1[h]. CX-0004C Q121 (Lumkes Opening WS).

Wirtgen Br. at 87-88.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 145-47 (Caterpillar disputes limitation 1[g] only); Caterpillar Reply at 41-42 (same).

The evidence shows that the PM620's lifting position sensors []. *See* CX-0004C (Lumkes WS) at Q/A 121; CX-0061C (PM620 Parts Manual) at 558. Accordingly, the administrative law judge has determined that the PM620's lifting position sensors are connected in the manner that limitation 1[c] requires.

Thus, in summary, the administrative law judge has determined that the PM620 infringes claim 1.

2. Claim 2

Claim 2 follows:

2. The road construction machine of claim 1, further comprising:

a controller configured to receive the signals from the lifting position sensors, and to regulate the lifting positions of the lifting columns in response at least in part to the signals from the lifting position sensors.

JX-0003 at 8:14-20.

Wirtgen argues that the PM620 includes an electronic control module ("ECM") that constitutes a controller. Wirtgen Br. at 88. Wirtgen argues:

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As shown in CX-0591C.0240 (PM600 Technical Presentation), the [

] CX-0004C Q123 (Lumkes Opening WS). The [] illustrated in CX-0591C.0240 (PM600 Technical Presentation) are the same [] illustrated in CX-0061C.0569 (PM620 Parts Manual). As shown in CX-0591C.0240 (PM600 Technical Presentation), the [

] CX-0004C Q123 (Lumkes Opening WS). . . .

. . .

The PM620 [

] CX-0004C Q125 (Lumkes Opening WS). CX-0591C.0193 (PM600 Technical Presentation) (annotated). As such, the machine ECM is the recited controller of claim 2. CX-0004C Q122-125 (Lumkes Opening WS).

Id. at 88-90.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 145-49 (Caterpillar disputes limitation 1[g] and claim 5); Caterpillar Reply at 41-43 (same).

The evidence shows that the PM620 includes a controller—the ECM—[

] The ECM also [

] *See* CX-

0004C (Lumkes WS) at Q/A 122-25. Accordingly, the administrative law judge has determined that the PM620 infringes claim 2.

3. Claim 5

Claim 5 follows:

5. The road construction machine of claim 2, wherein:

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the controller is configured to provide at least one limiting value for the height adjustment of each of the lifting columns.

JX-0003 at 7:51-8:13.

Wirtgen argues, in part:

The PM620 ECM “is configured to provide at least one limiting value for the height adjustment of each of the lifting columns,” as recited in claim 5. CX-0004C Q126 (Lumkes Opening WS); CPX-0080C 0:30 to 0:48 (PM620 Video Raising & Lowering); CX-0059C.0048 (PM620 Operation and Maintenance Manual); CX-0591C.0193, .0210-0211 (PM600 Technical Presentation). Specifically, the PM620 ECM defines [

]. CX-0591C.0210-0211 (PM600 Technical Presentation); CX-0004C Q129 (Lumkes Opening WS); CDX-0001C.0032-33 (Lumkes Direct Demonstrative). When raised, the machine ECM [

]. CX-0059C.0048 (PM620 Operation and Maintenance Manual); *see also* CX-0591C.0193 (PM600 Technical Presentation) ([

]). This [

] is shown in the inspection video CPX-0080C at 0:30 to 0:48 (PM620 Video Raising & Lowering); CX-0004C Q130 (Lumkes Opening WS).

Wirtgen Br. at 90.

Caterpillar argues that “[] is not a ‘limiting value’ as described by this claim” because “[

].” Caterpillar Br. at

147.

Wirtgen replies, in part:

Caterpillar’s theory is that because an operator can [], it cannot be a limiting value. Cat. PH Br. at 147. Nothing in the specification requires the limiting value to be physically unsurpassable. Caterpillar describes the [

]. *Id.* The manuals clearly state that the machine “[

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]. Hearing Tr. 758:16-759:8 (Engelmann).

Wirtgen Br. at 27.

Caterpillar replies that the [

]. Wirtgen Reply at 42.

Having considered the parties' arguments, the administrative law judge has determined that the PM620's ECM includes a limiting value for the height adjustment, [

]. See CX-0004C (Lumkes WS) at Q/A 126, 129-30. Mr. Engelmann, a Caterpillar engineer, testified that [

]. See Engelmann Tr. 758-759. Accordingly, the administrative law judge has determined that the PM620 infringes claim 5.

4. Claim 16

Claim 16 follows:

16. The road construction machine of claim 2, wherein:

the controller is configured to raise the lifting columns synchronously to one another.

JX-0003 at 7:51-8:13.

Wirtgen argues that the PM620's ECM can raise all of the lifting columns at the same time. See Wirtgen Br. at 91-93.

Caterpillar does not clearly rebut this argument. See generally Caterpillar Br. at 145-49 (Caterpillar disputes limitation 1[g] and claim 5); Caterpillar Reply at 41-43 (same).

The evidence shows that the PM620 includes a controller—the ECM—that can raise all of the PM620's lifting columns synchronously to one another. See CX-0004C (Lumkes WS) at

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Q/A 122-25; CX-0591C at 193 (“[

]”). Accordingly, the administrative law judge has determined that the PM620 infringes claim 16.

5. Claim 22

Claim 22 follows:

22. The road construction machine of claim 1, further comprising:
an indicator device operable to display the lifting positions of each of the lifting columns corresponding to the signals produced by the lifting position sensors.

JX-0003 at 7:51-8:13.

Wirtgen argues that the “PM620 also includes an indicator device operable to display the lifting positions of each of the lifting columns corresponding to the signals produced by the lifting position sensors, as recited in claim 22[.]” Wirtgen Br. at 94.

Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 145-49 (Caterpillar disputes limitation 1[g] and claim 5); Caterpillar Reply at 41-43 (same).

The PM620 includes a display that is connected to the machine ECM. The display displays the position of the lifting columns, which corresponds to the signals produced by the lifting position sensors. *See* CX-0004C (Lumkes WS) at Q/A 137; CPX-0084C (PM620 Video Sensor Check PSC Values). Dr. Lumkes provided the following demonstrative showing the display:

[

– Figure omitted –

]

CDX-0001C (Lumkes Demonstratives) at 38. Accordingly, the administrative law judge has determined that the PM620 infringes claim 22.

6. Claim 23

Claim 23 follows:

23. The road construction machine of claim 22, wherein:

the plurality of lifting columns includes two front lifting columns and two rear lifting columns; and

the indicator device is operable to display the lifting positions of the two front lifting columns and two rear lifting columns.

JX-0003 at 7:51-9:55.

Wirtgen argues that the display can show, individually, the lifting positions of the all four legs. *See* Wirtgen Br. at 94-95.

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Caterpillar does not clearly rebut this argument. *See generally* Caterpillar Br. at 145-49 (Caterpillar disputes limitation 1[g] and claim 5); Caterpillar Reply at 41-43 (same).

The PM620 includes two front lifting columns, two rear lifting columns, and a display that can show the height (*i.e.*, the lifting position) of all four columns. *See* CX-0004C (Lumkes WS) at Q/A 135-43; CPX-0084C (PM620 Video Sensor Check PSC Values); CDX-0001C (Lumkes Demonstratives) at 38. Accordingly, the administrative law judge has determined that the PM620 infringes claim 23.

D. Domestic Industry (Technical Prong)

Wirtgen argues that its W210i, W150CFi, and W120Ri machines practice claims 2, 5, 16, and 23. *See* Wirtgen Br. at 95-103.

Caterpillar's entire argument is two paragraphs:

Claim 1 requires "a plurality of lifting position sensors, each lifting position sensor being coupled with elements of one of the lifting columns, which elements are capable of being displaced relative to one another in accordance with the lifting position of the lifting column . . ." Wirtgen has failed to show this limitation is satisfied by any of its DI products. Dr. Lumkes opines that the leg cylinders of the alleged DI products each "includes a position sensor made of a transducer and a position magnet." CX-0004C at Q/A 172 (emphasis added). Thus, just as he does in his infringement analysis, he includes the separate, detached position magnet as part of the "position sensor," when in fact it is the target of the sensor, not the sensor itself. CX-0004C.0047. Wirtgen's sensor design is illustrated through a drawing on CX-0178.003 (W210i Hydraulic Cylinder with Position Transducer). Neither Dr. Lumkes nor Wirtgen has provided any evidence that the magnet in this device—which separate from the sensing module—is properly considered part of the "lifting position sensor" as that term is used in claim 1 of the '530 patent. Again, this type of sensor is different from the wire-rope sensor that is described extensively and illustrated in Fig. 3 of the '530 patent. RX-0991C at Q/A 45-53.

Thus, the only position sensor in the leg columns of the alleged D.I. machines is the "sensing module" identified above. Wirtgen has failed to show that this component (the actual sensor) is coupled to

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plural elements of the lifting column, as required by claim 1. Instead, the “sensing module” is only attached to one element of the lifting column, *i.e.*, the top of the piston cylinder unit, and Wirtgen does not contend otherwise. RX-0991C at Q/A 45-53. Accordingly, Wirtgen has failed to carry its burden of showing that the alleged D.I. machines satisfy this limitation, which is required by all asserted claims in the ‘530 patent.

Caterpillar Br. at 149-50. Caterpillar’s reply is just one sentence:

For the same reasons explained above for the representative PM620 machine, Wirtgen has failed to show that its DI products satisfy the requirement in claim 1 (and therefore dependent claims 2, 5, 16, and 23) that “each lifting position sensor [is] coupled with elements of one of the lifting columns, which elements are capable of being displaced relative to one another.

Caterpillar Reply at 43. Thus, Caterpillar disputes limitation 1[g] only.

1. Claim 1

*a) Limitations 1[p] and 1[a]-1[f]*⁸⁹

Wirtgen argues that its W210i, W150CFi, and W120Ri machines include the specific structures described in limitations 1[p] and 1[a]-1[f]. Wirtgen Br. at 96-99.

Caterpillar does not clearly rebut this argument. *See* Caterpillar Br. at 149-50 (Caterpillar disputes limitation 1[g] only); Caterpillar Reply at 43 (same).

The evidence shows that the W210i, W150CFi, and W120Ri machines include the specific structures described in limitations 1[p] and 1[a]-1[f]. *See* CX-0004C (Lumkes WS) at Q/A 157-65. Accordingly, the administrative law judge has determined that the W210i, W150CFi, and W120Ri machines practice limitations 1[p] and 1[a]-1[f].

⁸⁹ Wirtgen’s domestic industry arguments combine limitations 1[g] and 1[h] from its infringement arguments into one limitation, which it labels 1[g]. *Compare* CDX-0001C at 24-25 (analyzing limitations 1[g] and 1[h] for infringement) *with id.* at 63-64 (analyzing limitation “1[g]” for domestic industry).

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b) Limitation 1[g]

For its domestic industry analysis, Wirtgen presents limitation 1[g] as follows:

1[g] a plurality of lifting position sensors, each lifting position sensor being coupled with elements of one of the lifting columns, which elements are capable of being displaced relative to one another in accordance with the lifting position of the lifting column in such a manner that a signal including information on a current lifting position of the lifting column is produced by the lifting position sensor, wherein each of the lifting position sensors is connected to the at least one piston cylinder unit located within its associated lifting column.

See CDX-0001C (Lumkes Demonstratives) at 63-64.

Wirtgen argues:

The hydraulic cylinders within the W210i, W150CFi, and W120Ri lifting columns satisfy element 1[g], the sole disputed element of claim 2. CX-0004C Q166 (Lumkes Opening WS); CX-0010C (Allen WS) Q27; CX-0178 (W210i Hydraulic Cylinder with Position Transducer). The W210i leg cylinder includes a position sensor made of a transducer and a position magnet. CX-004C Q172 (Lumkes Opening WS); CX-0178 (W210i Hydraulic Cylinder with Position Transducer). The position sensor generates a varying 4 to 20 mA signal. The magnitude of the current is dependent on the position of the position magnet relative to the transducer. That is, the magnitude of the current of the output signal contains information about the position of the cylinder and, thus, the lifting position of the lifting column in which the cylinder is positioned. CX-0004C Q172 (Lumkes Opening WS); CDX-0001C.0063 (Lumkes Direct Demonstrative); CX-0010C (Allen WS) Q27. And the transducer and magnet of the W210i leg position sensor is connected to relatively movable components of the hydraulic cylinder. CX-0004C Q173-175 (Lumkes Opening WS). There are no material differences between the W150CFi and W120Ri position sensors and the W210i position sensor. CX-0004C Q177 (Lumkes Opening WS); CX-0010C (Allen WS) Q28-29, 31-37.

Wirtgen Br. at 98-99.

As noted above, Caterpillar argues that the Wirtgen machines do not practice claim 1 because they use a “separate, detached position magnet as part of the ‘position sensor,’ when in

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fact it is the target of the sensor, not the sensor itself.” Caterpillar Br. at 149; Caterpillar Reply at 43.

The administrative law judge previously determined that a position sensor with a separate position magnet can satisfy limitation 1[g]. *See* Part VII(C)(1)(h), *supra*. The same logic governs here, and the administrative law judge, therefore, finds that the position sensors in the W210i, W150CFi, and W120Ri’s lifting columns practice limitation 1[g]. *See* CX-0004C (Lumkes WS) at Q/A 166-77. The sensors and position magnets in the legs are connected to the cylinders in the legs. *Id.* at Q/A 173-74. Accordingly, the administrative law judge has determined that the Wirtgen machines include the lifting position sensors described in limitation 1[g].

Thus, in summary, the administrative law judge has determined that the Wirtgen machines—the W210i, W150CFi, and W120Ri—practice claim 1.

2. Claims 2, 5, 16, 22, and 23

Wirtgen argues that its W210i, W150CFi, and W120Ri machines practice claims 2, 5, 16, and 23. *See* Wirtgen Br. at 95-103.

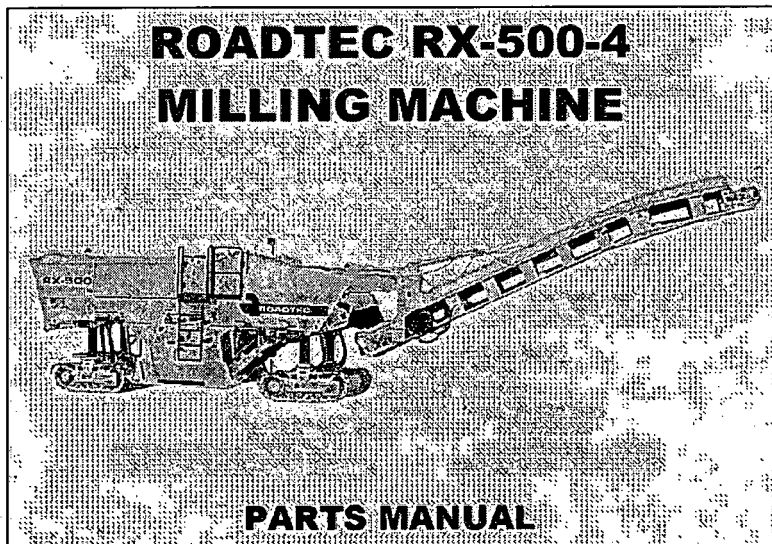
Caterpillar does not clearly rebut this argument. *See* Caterpillar Br. at 149-50 (Caterpillar disputes limitation 1[g] only); Caterpillar Reply at 43 (same).

The evidence shows that Wirtgen’s W210i, W150CFi, and W120Ri machines practice claims 2, 5, 16, and 23. *See* CX-0004C (Lumkes WS) at Q/A 154-98. Accordingly, the administrative law judge has determined that Wirtgen’s machines practice claims 2, 5, 16, and 23.

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E. Obviousness – “Roadtec RX-500 (alone . . .), in combination with Davis”

Caterpillar argues that claims 2 and 16 would have been “Obvious over Roadtec RX-500 (alone or in view of Glasson), in combination with Davis[.]” Caterpillar Br. at 77. The Roadtec RX-500 is a road milling machine, which is depicted below:



RX-0500 (RX-500 Parts Manual) at 1.⁹⁰ “Glasson” (RX-0022) is U.S. Patent No. 6,234,061, and “Davis” (RX-0023) is U.S. Patent Application No. 2002/0047301.

Wirtgen argues, in general, that Caterpillar’s “Roadtec RX-500 Theories” fail. *See* Wirtgen Br. at 109-22. Wirtgen does not dispute that the RX-500 machine, Glasson, or Davis are prior art under 35 U.S.C. § 102(b). *Id.*

1. Claim 1

For its obviousness analysis, Caterpillar divides claim 1 into ten elements, as follows:

[1.0] 1. A road construction machine, comprising:

[1.1] a machine frame;

⁹⁰ The exhibit number for the Roadtec RX-500 Parts Manual is RX-0500.

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- [1.2] a working drum supported from the machine frame for working a ground surface or traffic surface;
- [1.3] a plurality of ground engaging supports for supporting the construction machine on the ground surface or traffic surface;
- [1.4] a plurality of lifting columns, each one of the lifting columns being connected between the machine frame and one of the ground engaging supports,
- [1.5] each one of the lifting columns including two telescoping hollow column members
- [1.6] and at least one piston cylinder unit located within the telescoping hollow column members for adjusting a height of the lifting column so that each one of the lifting columns is adjustable in height relative to the machine frame,
- [1.7] each lifting column having a lifting position corresponding to a position of one of the two telescoping hollow column members relative to the other of the two telescoping hollow column members; and
- [1.8] a plurality of lifting position sensors, each lifting position sensor being coupled with elements of one of the lifting columns, which elements are capable of being displaced relative to one another in accordance with the lifting position of the lifting column in such a manner that a signal including information on a current lifting position of the lifting column is produced by the lifting position sensor,
- [1.9] wherein each of the lifting position sensors is connected to the at least one piston cylinder unit located within its associated lifting column.

See Caterpillar Br. at 81-102; JX-0003 at 7:51-8:13.⁹¹ Each element is addressed below.

a) [1.0] 1. A road construction machine

Caterpillar argues that the “Roadtec RX-500 is a road construction machine, specifically a road ‘milling machine’ (*i.e.*, a machine used to mill the road surface).” Caterpillar Br. at 81.

⁹¹ Elements [1.5] and [1.6] correspond to limitation 1[e] from infringement.

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Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 110 (Wirtgen disputes elements [1.8] and [1.9]); Wirtgen Reply at 31-32 (same).

The evidence shows that the RX-500 is a road construction machine that is used to mill roads. *See* RX-0985C (Alleyne WS) at Q/A 81-83. Accordingly, the administrative law judge has determined that the RX-500 is a road construction machine as described in the preamble.

b) [1.1] a machine frame

Caterpillar argues that the “Roadtec RX-500 includes a machine frame.” Caterpillar Br. at 82.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 110 (Wirtgen disputes elements [1.8] and [1.9]); Wirtgen Reply at 31-32 (same).

The evidence shows that the RX-500 is a construction machine that has a machine frame. *See* RX-0985C (Alleyne WS) at Q/A 84-86. Accordingly, the administrative law judge has determined that the RX-500 includes a machine frame, as element [1.1] requires.

c) [1.2] a working drum supported from the machine frame for working a ground surface or traffic surface

Caterpillar argues that the RX-500 includes a cutter drum, which is attached to the frame, that constitutes the working drum of element [1.2]. *See* Caterpillar Br. at 82-83.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 110 (Wirtgen disputes elements [1.8] and [1.9]); Wirtgen Reply at 31-32 (same).

The evidence shows that the RX-500 includes a cutter drum (*e.g.*, a working or milling drum), which works ground surfaces, that is supported from the frame. *See* RX-0985C (Alleyne WS) at Q/A 87-94. Accordingly, the administrative law judge has determined that the RX-500 includes the working drum described in element [1.2].

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d) [1.3] a plurality of ground engaging supports for supporting the construction machine on the ground surface or traffic surface

Caterpillar argues that the RX-500 includes four “leg tube” columns that connect to four tracks, thus disclosing element [1.3]. *See* Caterpillar Br. at 83-84.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 110 (Wirtgen disputes elements [1.8] and [1.9]); Wirtgen Reply at 31-32 (same).

The evidence shows that the RX-500 includes four leg tubes and four tracks that support the machine from the ground. *See* RX-0985C (Alleyne WS) at Q/A 96-102. Accordingly, the administrative law judge has determined that the RX-500 includes the plurality of ground-engaging supports described in element [1.3].⁹²

e) [1.4] a plurality of lifting columns, each one of the lifting columns being connected between the machine frame and one of the ground engaging supports

Caterpillar argues that the RX-500 includes four leg tubes that are connected to the machine frame and the tracks. *See* Caterpillar Br. at 84-85. The leg tubes include hydraulic cylinders that lift the machine. *Id.*

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 110 (Wirtgen disputes elements [1.8] and [1.9]); Wirtgen Reply at 31-32 (same).

The evidence shows that the RX-500 includes four legs that include lifting columns and that the lifting columns are connected between the machine frame and a track. *See* RX-0985C (Alleyne WS) at Q/A 103-09. Accordingly, the administrative law judge has determined that the RX-500 includes the plurality of lifting columns described in element [1.4].

⁹² This RX-500 also discloses this limitation with just three leg tubes and tracks.

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f) [1.5] each one of the lifting columns including two telescoping hollow column members

Caterpillar argues that the RX-500's lifting columns are the leg tubes, which include two telescoping, hollow columns and hydraulic cylinders. *See* Caterpillar Br. at 85-86.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 110 (Wirtgen disputes elements [1.8] and [1.9]); Wirtgen Reply at 31-32 (same).

The evidence shows that the RX-500 includes leg tubes that each has two hollow, telescoping components and a hydraulic cylinder that lifts the machine. *See* RX-0985C (Alleyne WS) at Q/A 103-19. Accordingly, the administrative law judge has determined that the RX-500 discloses the subject matter recited in element [1.5].

g) [1.6] at least one piston cylinder unit located within the telescoping hollow column members for adjusting a height of the lifting column so that each one of the lifting columns is adjustable in height relative to the machine frame

Caterpillar argues that each of the RX-500's leg tubes includes a hydraulic cylinder that can adjust the leg's height relative to the frame. *See* Caterpillar Br. at 86-87.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 110 (Wirtgen disputes elements [1.8] and [1.9]); Wirtgen Reply at 31-32 (same).

The evidence shows that each of the RX-500's leg tubes contain a hydraulic cylinder that adjusts the height of the tube such that each leg tub is adjustable in height relative to the machine frame. *See* RX-0985C (Alleyne WS) at Q/A 120-30. Accordingly, the administrative law judge has determined that the RX-500 includes lifting columns that have the two telescoping columns and the piston cylinder described in element [1.6].

h) [1.7] each lifting column having a lifting position corresponding to a position of one of the two telescoping hollow column

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members relative to the other of the two telescoping hollow column members

Caterpillar argues that the RX-500's leg tubes have a lifting position that corresponds to the relative positions of the two telescoping, hollow columns. *See* Caterpillar Br. at 87.

Wirtgen does not clearly rebut this argument. *See generally* Wirtgen Br. at 110 (Wirtgen disputes elements [1.8] and [1.9]); Wirtgen Reply at 31-32 (same).

The evidence shows that each of the RX-500's leg tubes (*e.g.*, the lifting columns) have a lifting position that corresponds to the relative positions of the two telescoping, hollow columns. *See* RX-0985C (Alleyne WS) at Q/A 131-36 ("The position of the lifting column corresponds to the position of one of the two telescoping hollow leg tube members relative to the other."). Accordingly, the administrative law judge has determined that the RX-500's lifting columns have the lifting position described in element [1.7].

- i) ***[1.8] a plurality of lifting position sensors, each lifting position sensor being coupled with elements of one of the lifting columns, which elements are capable of being displaced relative to one another in accordance with the lifting position of the lifting column in such a manner that a signal including information on a current lifting position of the lifting column is produced by the lifting position sensor***

Caterpillar argues that the RX-500 includes three yo-yo sensors that disclose this element:

The Roadtec Parts Manual discloses three "yo-yo elevation sensors" as machine parts. *See* RX-0019.0176 (RX-500 Parts Manual). A "yo-yo" sensor is another name for a wire-rope sensor—the same type of sensor that is used in Figure 3 of the '530 patent. JX-0003 ('530 Patent), 6:25-37; Trial (Lumkes) at 305:19-306:11 (agreeing that a yo-yo sensor reads how much the string is moving based on rotations of the spool); Tr. (Alleyne) at 884:24-885:1 (explaining that yo-yo sensor is another term for wire-rope sensor). Item 65 is the left front sensor (part number 205005-03), Item 66 is the right front sensor (part number 205006-03), and Item 67 is the rear sensor (part number 207007-03). RX-0019.0176; *see also* RX-0985C at

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Q/A 143. These yo-yo sensors are contained in the machine shown on RX-0019.0172-173. As Mr. Lewis confirmed, and as the RX-500 Parts manual shows, [

] RX-0019.0165, 0172-176; JX-0045C (Lewis Deposition Transcript) at 124:8-125:7. Dr. Lumkes admits that the Roadtec Parts Manual, at RX-0019.0176 alone, shows that the Roadtec RX-500 had three yo-yo sensors, and that these sensors are “a part or related to the front right and left leg assemblies and the rear left assembly.” CX-005C (Lumkes Rebuttal WS) at Q/A 67.

Caterpillar Br. at 88-89. Caterpillar argues that the RX-500’s legs include “linear position measurement” components that are “paired with each of the yo-yo sensors and determines the extent to which the yo-yo sensor moves.” *Id.* at 89. Caterpillar relies on an electrical schematic, which it contends “shows that the path of the signals obtained from the three yo-yo sensors in the RX-500 were used to display the positions of the four leg columns on a status indicator.” *Id.* at 90. Caterpillar argues that the position information was sent to a display and that the yo-yo sensors were attached to the leg tubes. *Id.* at 92-94.

Wirtgen argues that “the RX-500 does not disclose, as independent claim 1 requires, that each of the recited lifting position sensors is ‘*coupled with elements of one of the lifting columns*’ and specifically that ‘each of the lifting position sensors is connected to the at least one piston cylinder unit located within its associated lifting column.’” Wirtgen Br. at 110 (emphasis added). In particular, Wirtgen argues that RX-0019 (the RX-500 parts manual) does not show where the yo-yo sensors are connected. *Id.* at 111. Wirtgen also contends that Mr. Lewis’s testimony is uncorroborated. *Id.* at 112-13. (Mr. Lewis assembled the RX-500 legs).

Caterpillar argues that Wirtgen “conspicuously ignores the RX-500 electrical schematic (RX-0020), which—in conjunction with the Parts Manual (RX-0019)—proves that the RX-500

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had yo-yo elevation sensors mounted to the leg columns that tracked the extension and retraction of the leg columns.” *See* Caterpillar Reply at 20-21.

Wirtgen’s entire reply to Caterpillar’s argument that the RX-500 expressly discloses this element follows:

Caterpillar again begins its analysis with unasserted claim 1, from which claim 2 depends. Caterpillar asserts that claim 1 would have been obvious over the Roadtec RX-500 in view of the knowledge of a POSITA or Glasson’s disclosures of sensors, setting aside the limitations of claim 2 from its analysis. Although Caterpillar identifies the three yo-yo sensors of the Roadtec RX-500 as being the plurality of sensors recited in claim 1, the Roadtec RX-500 manuals reveal little about the yo-yo sensors other than their identity. RX-0019.0172-174 (RX-500 Parts Manual). Nothing shows where the yo-yo sensors are located, what they are coupled with, or what their attachment points are. Hearing Tr. 836:17-19, 837:14-16, 838:3-829:9 [*sic*, 839:9] (Alleyne). The manuals therefore do not disclose each sensor “coupled with elements of one of the lifting columns” or “each of the lifting position sensors is connected to the at least one piston cylinder unit located within its associated lifting column.” CX-0005C (Lumkes Rebuttal WS) Q72; RX-0985C.0048 (Alleyne Direct WS).

Wirtgen Reply at 31. Wirtgen again argues that Mr. Lewis’s testimony is uncorroborated. *Id.* at 32.

Having considered the parties’ arguments, the administrative law judge has determined that Caterpillar has shown, through clear and convincing evidence, that the RX-500 expressly discloses a road machine having “a plurality of lifting position sensors” as described in element [1.8]. *See* RX-0985C (Alleyne WS) at Q/A 138-168. As Dr. Alleyne explained, the lifting sensors are coupled with the columns, as shown through the electrical schematics. *See, e.g., id.* at Q/A 145 (“A POSITA would understand from these disclosures that a linear position measurement component would be paired with each of the yo-yo sensors, and that the linear position measurement component determines the extent to which the yo-yo sensor moves.”), Q/A

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150-61. The sensors produce a signal that includes information about the position of the lifting column, which is based on the movement of the column's components. *Id.* Further, Wirtgen has not taken account of the electronic schematic, RX-0020, so Caterpillar's arguments and Dr. Alleyne's testimony on this document are unrebutted. Accordingly, the administrative law judge has determined that the RX-500 includes the lifting sensors described in element [1.8].

j) ***[1.9] wherein each of the lifting position sensors is connected to the at least one piston cylinder unit located within its associated lifting column.***

Caterpillar argues that "[i]f not expressly disclosed, this feature was obvious in view of the Roadtec RX-500 alone, or in view of Glasson." Caterpillar Br. at 95. Caterpillar argues, in part:

Element [1.9] requires that each lifting position sensor be connected to the piston cylinder unit inside the lifting column. The yo-yo sensors in the Roadtec RX-500 were indirectly connected to the piston cylinder unit through the lifting column elements. Wirtgen's expert, Dr. Lumkes, admitted this at trial. Tr. (Lumkes) at 322:8-14. Thus, the Roadtec RX-500 expressly meets Element [1.9]. But to the extent this limitation is construed to require a direct connection to the piston cylinder, this arrangement was merely a routine design choice that was well within the knowledge of a POSITA. See RX-0985 (Alleyne Direct Witness Statement) at Q/A 180-199.

Caterpillar Br. at 96.

As with element [1.8], all Wirtgen cites is CX-0005C (Lumkes RWS) at Q/A 62, which pertains to claim 2. See Wirtgen Br. at 110. In reply, Wirtgen argues that the RX-500 manuals "do not disclose whether yo-yo sensors are mounted internally or externally." Wirtgen Reply at 31. Wirtgen also argues that the manuals do not show "where the yo-yo sensors are located, what they are coupled with, or what their attachment points are." *Id.* (citing Alleyne Tr. 836-839).

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Caterpillar replies that “Wirtgen concedes that one page alone in the RX-500 Parts Manual shows that ‘three yoyo elevation sensors are a part or related to the front right and left leg assemblies and the rear left assembly.’” Caterpillar Reply at 20 (quoting Wirtgen Br. at 111).

Having considered the parties’ arguments, the administrative law judge has determined that the RX-500’s lifting position sensors (*i.e.*, the yo-yo sensors) are indirectly connected to the piston cylinder unit located within its associated lifting column. *See* RX-0985C (Alleyne WS) at Q/A 180-82. Claim 1 does not require a direct physical connection.⁹³ Wirtgen’s arguments about the placement of the sensors within the lifting column fails because the “within” requirement of element [1.8] relates to the piston cylinder unit, not the sensor. Further, even if the yo-yo sensor were located outside of the leg tube, which the administrative law judge finds extremely unlikely given Mr. Lewis’s testimony and the harsh conditions in which road milling machines operate, the administrative law judge would find that placing the yo-yo sensor within the leg tube would have been an obvious modification to a person of ordinary skill in the art. *See, e.g.*, RX-0022 at 2:1-12 (“no sensor mountable to the outside of heavy equipment or relying upon contacting elements has gained widespread use in the industry.”). In any event, a person of ordinary skill—an engineer with a mechanical engineering degree and 2-5 years of experience designing machines—could at once envisage a leg column with a yo-yo sensor disposed on the column’s interior, rather than on the exterior. *See* RX-0985C (Alleyne WS) at Q/A 183-84; *Blue*

⁹³ Indeed, to the extent that “connected” would need a construction, the administrative law judge would construe the term to include an indirect connection, as the specification uses the word “connected” to describe indirect connections between the wheels and the machine frame. *See, e.g.*, JX-0003 at 1:15-19 (“The chassis is provided with wheels and/or crawler track units which are connected to the machine frame via lifting columns and are individually adjustable in height relative to the machine frame.”) and 1:31-35 (“A known construction machine of the applicant is the recycler WR 2000, the wheels of which are connected to the machine frame via lifting columns that are adjustable in height hydraulically.”).

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Calypso, LLC v. Groupon, Inc., 815 F.3d 1331, 1341 (Fed. Cir. 2016) (quoting *Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376, 1381 (Fed. Cir. 2015) for the proposition that “a reference can anticipate a claim even if it ‘d[oes] not expressly spell out’ all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would ‘at once envisage’ the claimed arrangement or combination.”). Accordingly, the administrative law judge has determined that the RX-500 includes the lifting sensors described in element [1.9].

Thus, in summary, the administrative law judge has determined that Caterpillar has shown that the RX-500 anticipates claim 1.⁹⁴

2. Claim 2

Caterpillar argues that Davis discloses the controller recited in claim 2:

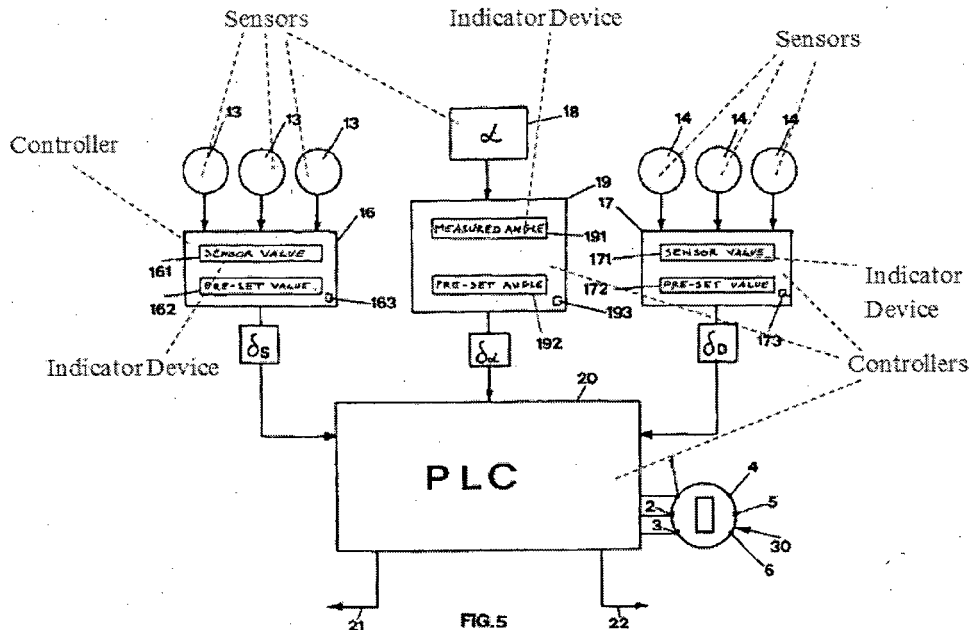
As explained above, Davis discloses a road milling machine with a controller (*see* Fig. 5, below) that controls parameters used to establish the scarification (milling) profile cut by the cutting drum 11. RX-0023 (Davis) at ¶ [0043]; Tr. (Lumkes) at 326:19-21 (testifying that the Davis machine functions as “a road milling machine”). The controller device in Davis controls the position of the machine (and drum) relative to the ground by raising and lowering the legs, which include hydraulic cylinders 7-10 (also referred to as “hydraulic jacks”) that extend and retract. RX-0023 (Davis) at ¶¶[0042-43]; Tr. (Lumkes) at 325:4-326:21 (testifying that Davis has “hydraulic jacks” that “are used to lift the machine up and down” and that the drum “moves in response to how the legs move”).

The controller in Davis receives information from various sensors, four of which are “positioned right near the legs.” Tr. (Lumkes) at

⁹⁴ In the alternative, the administrative law judge finds that Caterpillar has shown that claim 1 would have been obvious in light of the RX-500. All elements of claim 1 are present in the RX-500, and indeed assembled in one integral machine. The obviousness finding does not rely on inherency, and the secondary considerations, discussed below, are not strong. *See Cohesive Techs., Inc. v. Waters Corp.*, 543 F.3d 1351, 1364 (Fed. Cir. 2008) (“While it is commonly understood that prior art references that anticipate a claim will usually render that claim obvious, it is not necessarily true that a verdict of nonobviousness forecloses anticipation. The tests for anticipation and obviousness are different. . . . ‘it does not follow that every technically anticipated invention would also have been obvious.’”).

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327:2-19. The controller uses information from the sensors to ensure that the machine conforms to the desired scarification (milling) profile. *Id.*, ¶¶[0043, 0049]. Annotated Figure 5 of Davis, showing the controller, is provided below:



The Davis controller compares measurements from its sensors to preset parameters to achieve the desired milling profile. *Id.*, ¶[0013, 0043], FIG. 5. Specifically, sensors 13, 14, 18 send signals to data processing systems 16, 17, 19, which compare these values with the preset values, and generate difference signals. *Id.*, ¶[0049]; Tr. (Lumkes) at 327:20-329:14. The PLC then uses these difference signals to extend or retract the legs in a way that eliminates the delta, or difference, that the system was detecting by returning the measured value to the preset value. RX-0023 (Davis) at ¶[0049]; *see also* RX-0985C (Alleyne Direct Witness Statement) at 223-227; Tr. (Lumkes) at 329:16-20. Thus, Davis discloses a delta, deviation-elimination control system that allows a road milling machine to automatically and continually maintain the desired milling profile through leg positioning. Tr. (Lumkes) at 329:21-24 (testifying that the Davis control system is a “deviation elimination control system”). Notably, Figure 5 of Davis shows a display with the sensed values right next to the preset values, which permits the operator to verify that the automated system is eliminating the deltas. RX-0023 (Davis).

Caterpillar Br. at 103-04.

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Wirtgen argues that the RX-500 does not include a controller. *See* Wirtgen Br. at 109-13.

For Davis, Wirtgen argues:

Davis disclosed a road scarifier with three sensors on each side of the machine that indicate the relative distance between the sensors and the road surface, and a frame inclination sensor to show the inclination of the road scarifier with respect to the horizontal plane. RX-0023.0005-6 ¶¶0001, ¶¶0037 (Davis). The Davis side sensors could be ultrasound sensors or reflection sensors. RX-0023.0006 ¶¶0034 (Davis). None of these sensors were within the lifting column of the road scarifier, much less connected to a cylinder within the lifting column. CX-0005C (Lumkes Rebuttal WS) Q75. The Davis sensors did not provide information on the lifting position of each column. CX-0005C (Lumkes Rebuttal WS) Q75.

Furthermore, Davis does not disclose or render obvious the controller recited in claim 2, because Davis discloses a grade and slope control system. Its controller is not connected to any leg position sensors and does not regulate machine height based on any signals from the leg position sensors. CX-0005C (Lumkes Rebuttal WS) Q77-78.

Davis alone thus fails to disclose a controller configured to regulate the lifting positions of lifting columns in response at signals from lifting position sensors within the lifting column. None of sensors 13 and 14 in Davis are positioned within the lifting columns of the road scarifier. Rather, the sensors 13 and 14 are externally mounted to the machine. Thus, Davis alone fails to disclose “a controller configured to receive the signals from the lifting position sensors,” as recited in claim 2 and which are “coupled with elements of one of the lifting columns” and “connected to the at least one piston cylinder unit located within its associated lifting column, as recited in claim 1. CX-0005C (Lumkes Rebuttal WS) Q78.

Wirtgen Br. at 114-15. Wirtgen also argues that a person of ordinary skill in the art “would not combine these references because the Davis system and method would not work for its intended purpose using only the internally mounted leg position sensors of the RX-500 as modified by Glasson.” *Id.* at 115. Wirtgen argues:

Again, grade and slope control systems like Davis need to measure an external grade reference such as the ground or a string line. Measuring this external grade reference allows the controller to

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determine the position of the machine relative the position of the ground at the location of the sensor, which should be at or near the milling drum housing. CX-0005C (Lumkes Rebuttal WS) Q80. Caterpillar's proposed modification uses Davis's grade and slope controller with the RX-500's (as modified by Glasson) alleged leg position sensors at the front left lifting column, front right lifting column, and rear right lifting column. In this proposed modification, there is no sensor to measure an external grade reference such as the ground or a string line. A person of ordinary skill in the art would have understood that a sensor at or near the milling drum housing that measures an external grade reference is imperative to a grade and slope control system to ensure an accurate measurement near the drum. A person of ordinary skill in the art would have understood that the orientation between the machine and the ground could not be determined using only leg position sensors, as proposed by Caterpillar. *See* Hearing Tr. 860:12-15. Thus, a person of ordinary skill in the art would not use the RX-500's alleged leg position sensors as the sensors in Davis's grade and slope control; none of the alleged leg position sensors measure an external reference at or near the milling drum housing. CX-0005C (Lumkes Rebuttal WS) Q80.

Id. at 115-16. Wirtgen also argues that one would not modify the RX-500 because it already contained a grade-and-slope control system and that the proposed combination “would have required a substantial re-design of the Davis’s control algorithms.” *Id.* at 116. Wirtgen further argues that “Replacing Davis’s external side reference sensors that measure an external reference with internally-mounted hydraulic cylinder position sensors that measure an internal reference as allegedly present in the RX-500 would alter the principle of operation of Davis’s external reference system.” *Id.* at 117.

Caterpillar replies that “claim 2 recites nothing more than” a controller configured to receive signals and regulate the lifting positions of the columns based on the signals. Caterpillar Reply at 28-29. Caterpillar argues that “[t]he reason Wirtgen is attempting to read these additional limitations into claim 2 is that the evidence clearly shows that the type of controller actually required by claim 2—which can be as simple as a conventional closed-loop feedback

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circuit to raise/lower legs to an operator set point—was known to a POSITA in 2005.” *Id.* at 29.

Caterpillar argues:

In rebutting Caterpillar’s motivation to combine, Wirtgen fails to address the actual argument Caterpillar proposes for the Roadtec RX-500 + Davis combination, focusing instead on its red herring “grade and slope” arguments discussed above. In doing so, Wirtgen improperly constructs a strawman combination and argues from there. Thus, Wirtgen’s motivation to combine arguments are flawed. Caterpillar responded in detail to Wirtgen’s “grade and slope” arguments in its initial post-hearing brief and above and will not reproduce those arguments here.

Once Caterpillar’s actual RX-500 + Davis argument is understood—*i.e.*, it would have been obvious to replace the toggle switches in the Roadtec RX-500 with the controller-based, delta-reduction concept described in Davis—it becomes clear that claim 2 is obvious. This minor modification would have allowed for automatic height correction without the need for manual operator control. RX-0985C (Alleyne Direct WS) at Q/A 228. For these reasons, Caterpillar has shown by clear and convincing evidence that claim 2 is invalid over the Roadtec RX-500 (alone or in view of Glasson) in combination with Davis.

Id. at 29-30.

Having considered the parties’ arguments, the administrative law judge has determined that Caterpillar has not shown that claim 2 would have been obvious based on the RX-500 (including Glasson) and Davis. To begin, it is clear and convincing that Davis discloses a controller that receives signals from sensors that monitor the position of the machine. *See* RX-0023, ¶¶ 43, 49-50; RX-0985C (Alleyne WS) at Q/A 221-24. Davis’s controller also regulates the height of the legs based on the signals from the sensors. *Id.*; *see also id.* at Q/A 225-27.

Wirtgen’s arguments about Davis’s sensors (*see, e.g.,* Wirtgen Br. at 114-15) misconstrues Caterpillar’s argument about how one of skill in the art would modify the RX-500 in view of Davis, because Caterpillar’s proposed combination relies on the sensors from the RX-

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500.⁹⁵ Caterpillar, however, has not sufficiently shown that a person of ordinary skill in the art would have modified the RX-500 in view of Davis (or that a person of ordinary skill would have combined the RX-500 and Davis). *See* CX-0005C (Lumkes WS) at Q/A 82-84. In particular, modifying Davis's controller to operate with the RX-500's sensors would upend Davis's principle of operation, which relies on an external reference system. *Id.* at Q/A 84. Similarly, the proposed modification would entail a substantial redesign of the controller in order to ensure the combination yielded a functional milling machine. *Id.* at Q/A 83-84 ("The Davis's control algorithm would have to be substantially modified to operate using only three leg position sensors, and to use yoyo elevation sensors, instead of Davis's side ultrasonic sensors."); *see also In re Ratti*, 270 F.2d 810, 813 (C.C.P.A. 1959); *Plas-Pak Indus., Inc. v. Sulzer Mixpac AG*, 600 F. App'x 755, 759 (Fed. Cir. 2015) ("Such a change in a reference's 'principle of operation' is unlikely to motivate a person of ordinary skill to pursue a combination with that reference."). Accordingly, the administrative law judge finds that claim 2 would not have been obvious over the RX-500 (including Glasson) in view of Davis.

3. Claim 16

Caterpillar argues, in part:

Claim 16 of the '530 patent depends from claim 2. As explained, claim 2 is obvious over the Roadtec RX-500 (alone or in view of Glasson) in combination with Davis. Similarly, the additional limitation of claim 16 would have been obvious in view of these same references. *See* RX-0985C (Alleyne Direct Witness Statement) at Q/A 245-254. [

⁹⁵ *See, e.g.,* Caterpillar Reply at 30 ("Caterpillar is not relying on Davis for leg sensors. The base reference in Caterpillar's combination is RX-500, which already has leg sensors.").

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J.”); RX-0028.0014 (PM-465 STMG) (showing that Caterpillar’s PM-465 machine in the late 1990s and early 2000s had a single “raise/lower” switch that, upon pressing it, caused all four legs to raise synchronously).

Caterpillar Br. at 111. Caterpillar then argues that Dr. Lumkes “does not dispute that an operator of the Roadtec RX-500 could raise all four legs of the machine ‘up at the same time’ by holding the toggle switches up at the same time.” *Id.* at 111-12. Caterpillar also argues that “the concept of raising the legs of a road milling machine synchronously is disclosed in Davis.” *Id.* at 113 (citing RX-0023 (Davis), ¶¶ 33, 41-42, 45; RX-0985C (Alleyne WS) at Q/A 223-233, 245-254). As a backup argument, Caterpillar also asserts “opting to use the Davis controller to synchronously lift the front two legs of a cold planer would have been obvious at that time.” *Id.* at 113-14.

For the RX-500 (including Glasson), Wirtgen argues that “claim 16 is valid over the RX-500 alone for the same reasons” presented for claims 1 and 2. Wirtgen Br. at 119. Wirtgen adds that “[n]othing of record has shown that the RX-500 control was capable of raising the lifting columns synchronously.” *Id.* at 120.

For the combination of the RX-500, Glasson, and Davis, Wirtgen argues:

Caterpillar’s analysis is flawed. Caterpillar cites RX-0023.0007 ¶0045 (Davis) for describing a “parameter setting” cycle design for setting the preset parameters. RX-0985C.0065 (Alleyne Direct WS). Caterpillar’s analysis of the parameters is an oversimplification of a road milling machine’s hydraulic elevation system. There are many factors that affect whether a machine raises or lowers in a synchronous or asynchronous fashion. CX-0005C (Lumkes Rebuttal WS) Q109. First, milling machine’s hydraulic elevation systems must be precise. *Id.* This precision requires that the legs be independently controllable such that grade and slope requirements can be met. *Id.* Second, the inclination of the ground on which the machine rest can affect the rate at which each lifting column raises—the weight distribution of the machine is dependent on the slope. *Id.* Third, the weight distribution of the machine changes over time as water and fuel in the tanks is consumed. In

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other words, it is not as simply as just raising the lifting columns synchronously or asynchronously. Caterpillar's argument that claim 16 would be obvious to try is therefore incorrect.

Wirtgen Br. at 120.

In reply, Wirtgen argues that the RX-500 did not employ "controller-automated functionality" because it required a human operator. Wirtgen Reply at 36. For Davis, Wirtgen argues:

Caterpillar then argues that Davis discloses synchronous lifting, based on its disclosure of one control lifting both front legs during a parameter-setting cycle. Cat. PH Br. at 112. Caterpillar concludes that "a POSITA would only have two ways to carry out the parameter-setting cycle: by lifting all the lifting columns synchronously, or by raising them in an asynchronous manner." Cat. PH Br. at 112. Caterpillar then lists several reasons why a POSITA might choose the synchronous option. Again, that is not a proper obviousness analysis.

Neither synchronous nor asynchronous lifting is disclosed in Davis. CX-0005C (Lumkes Rebuttal WS) Q104. Caterpillar assumes that both are options, which (1) has no foundation in the disclosure, and (2) means that synchronous is neither inherent nor inevitable. Caterpillar then hypothesizes reasons why a POSITA would choose synchronous lifting, which, even if true, does not establish that Davis teaches synchronous lifting. See Cat. PH Br. at 112-13. It merely establishes that Davis presents a problem that one of skill in the art would likely solve a certain way. CX-0005C (Lumkes Rebuttal WS) Q168-172. That is not clear and convincing evidence of synchronous lifting, much less is it evidence of the use of synchronous lifting within an intelligent leg control design that is itself not even disclosed in the prior art.

Id. at 36-37.

Having considered the parties' arguments, the administrative law judge has determined that claim 16 would have been obvious in light of Davis (and the RX-500). To begin, the administrative law judge notes that Caterpillar has not shown that Davis explicitly discloses a controller that "is configured to raise the lifting columns synchronously to one another," as claim

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16 requires. For example, when asked if Davis raises the lifting columns synchronously, Dr.

Alleyne testified as follows:

Q252. At some point during the operation of the Davis system that you just described, do the lifting columns raise synchronously to one another?

A: Yes. One of ordinary skill would only have two ways to carry out the parameter setting cycle that I just described: by lifting all the lifting columns synchronously, or by raising them in an asynchronous manner. Thus, one of ordinary skill would have good reason to pursue either of these known options, but in particular the option that involves raising the lifting columns synchronously with one another, because that option would lead to improved machine stability as compared to the other.

RX-0985C (Alleyne WS) at Q/A 252. However, as Dr. Alleyne testified, requiring the controller to raise the legs synchronously is clearly an obvious choice to implement when “configuring” the controller. *Id.* at Q/A 253 (describing known machines that could raise two legs synchronously). Wirtgen’s arguments about the “many factors” that affect synchronous lifting (*e.g.*, precision, the inclination of the ground, and weight distribution in the machine) are not present in the claims or specification. Thus, if claims 1 and 2 are found anticipated and obvious, respectively, the administrative law judge would find that claim 16 would have been obvious in light of the RX-500 (including Glasson) and Davis.

F. Obviousness – “Roadtec RX-500 (. . . in view of Glasson), in combination with Davis”

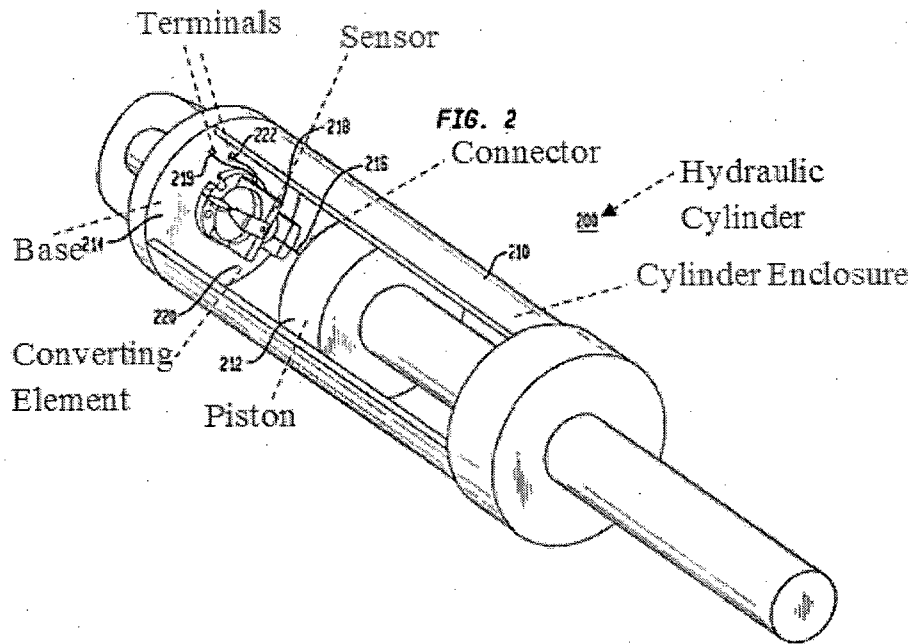
1. Claim 1

Caterpillar’s arguments concerning the RX-500 and Glasson pertain to element [1.9]. For element [1.9], Caterpillar argues:

Furthermore, as a separate, standalone basis for showing obviousness, it also would have been obvious to arrive at the design required by Element [1.9] by modifying the Roadtec RX-500 with the “smart cylinder” design disclosed in Glasson. *See* RX-0985C

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(Alleyne Direct Witness Statement) at Q/A 185-195. Glasson discloses mounting a sensor within a piston cylinder unit to provide a precision signal indicative of the position of the piston. RX-0022 (Glasson), Abstract. Glasson's "smart cylinder" is illustrated in greater detail in annotated Figure 2 shown below:



Glasson's "hydraulic cylinder 200" includes a piston cylinder unit (disclosed as "piston 212") and a cylinder enclosure 210. *Id.*, 3:65-4:1. This enclosure includes base 214, where the piston cylinder unit can move relative to the base. *Id.*, 4:1-5. The enclosure further includes a sensor (described as a "precision sensor 218") that provides a position-related signal across the terminals 219 and 222. *Id.*, 4:5-8. Through this configuration, the sensor can provide a signal indicative of the position of the piston cylinder unit via its coupling with elements of the unit, namely the enclosure 210, connector 216, base 214, and converting element 220. As the piston cylinder unit extends and retracts within the cylinder 200, these elements are displaced relative to one another, thus causing the sensor to provide a signal indicating the current lifting position of the cylinder. *See Id.*, 4:5-17 ("A precision sensor 218 provides a position related signal across terminals 219 and 222 . . . indicative of the position . . . [C]onconnector 216 . . . directly imparts the displacement of the piston 212 with respect to the base 214 to the converting element 220"). Because the sensor in Glasson is connected to the piston 212 via flexible connector 216, this sensor arrangement—when implemented in the Roadtec RX-500, would satisfy Element [1.9]'s requirement of being "attached to at least one

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piston cylinder unit located within [the] lifting column.” See RX-0985C (Alleyne Direct Witness Statement) at Q/A 185-195.

Caterpillar Br. at 100-01. Caterpillar argues that “a POSITA would use the Glasson sensor design in the leg tubes of the Roadtec RX-500” because Glasson’s “sensors are shielded from harsh environmental conditions.” *Id.* at 102 (citing RX-0022 at 2:1-45).

Wirtgen argues “Glasson discloses a hydraulic cylinder with an internal sensor. RX-0022 (Glasson). But Glasson does not teach or even suggest that such cylinders could or should be used in the lifting columns of road construction equipment.” Wirtgen Br. at 114. Wirtgen also argues that “While the in-cylinder sensors of Glasson may have been acceptable for the working arms of excavators and bucket loaders,” they would not be used in road construction machines because “the lifting columns in road milling machines are heavy and difficult to access internally [and] a faulty internal sensor would require significant downtime in order to replace.” *Id.* at 117.

Wirtgen’s reply concerning “Glasson” (and claim 1, ostensibly) follows:

Glasson, which discloses a position sensor mounted within a cylinder, fails to provide any further motivation to combine Davis with the RX-500’s leg position sensors. Glasson has nothing to do with road construction machines. RX-0022 (Glasson). At best, Glasson discloses that sensors may be used to measure the retraction and extension of a hydraulic cylinder. *Id.* Even if a POSITA were to find Glasson’s teachings pertinent to Davis or the RX-500, he would more likely modify Glasson’s sensor to sense an external elevation reference, rather than move Davis’s sensors inside the lifting columns. This is because, as described above, Davis’s controller would not work for its intended purpose using only internally mounted leg position sensors. CX-0005C (Lumkes Rebuttal WS) Q79-81; *see also* Hearing Tr. 815:3-7 (Alleyne) (stating that all grade and slope references measure an external point such as the ground surface).

Wirtgen Reply at 35.

Having considered the parties’ arguments, the administrative law judge has determined that the RX-500 and Glasson collectively disclose element [1.9]. As discussed above, the

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administrative law judge previously determined that the RX-500 disclosed element [1.9]. *See* Part VII(E)(1)(j), *supra*. To the extent that the RX-500 does not disclose mounting position sensors within a tube, Glasson teaches this. *See* RX-0985C (Alleyne WS) at Q/A 186-89. A person of ordinary skill in the art would understand the benefits of modifying the RX-500 in view of Glasson so that the sensors were inside the machine's leg, because doing so would shield the position sensors from harsh conditions. *Id.* at Q/A 190-91; RX-0022 at 2:1-45 ("It is a disadvantage of these sensors that they mount to the outside of the machinery, thereby exposing them to the environment."). Wirtgen's arguments about Glasson do not directly address the RX-500 and Glasson, and the arguments also unduly shortchange the ordinary artisan's skills. *See KSR*, 550 U.S. at 420-21 ("familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle. . . . A person of ordinary skill is also a person of ordinary creativity, not an automaton."). Accordingly, the administrative law judge has determined that the RX-500 and Glasson collectively disclose the lifting sensors described in element [1.9] and that a person of ordinary skill in the art would have been motivated to modify the RX-500 in light of Glasson's teachings.

G. Obviousness – "Roadtec RX-500 (alone or in view of Glasson), in combination with Davis and Hosseini"

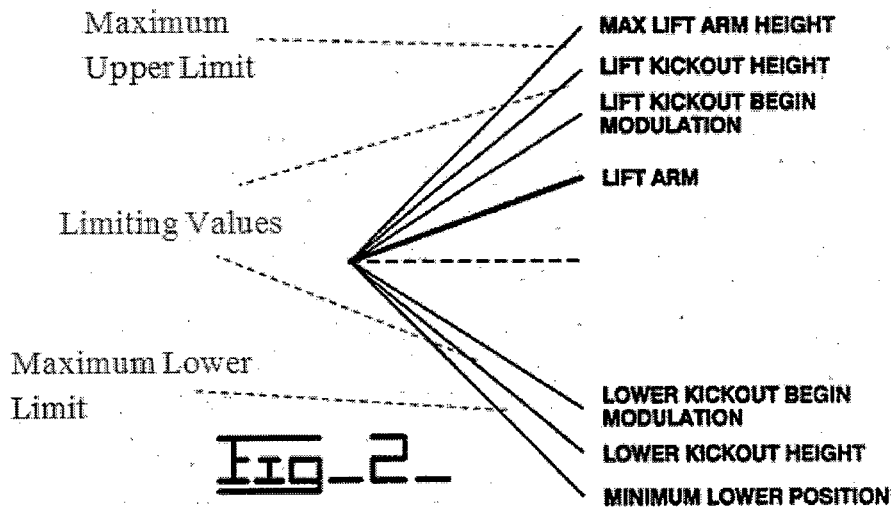
1. Claim 5

Caterpillar argues that claim 5 is "Obvious over Roadtec RX-500 alone (or in view of Glasson) in further view of Davis and Hosseini." Caterpillar Br. at 114. "Hosseini" (RX-0024) is U.S. Patent No. 5,189,940. Wirtgen argues that claim 5 is not obvious over this combination, but it does not dispute that Hosseini is prior art under 35 U.S.C. § 102(b). Wirtgen Br. at 117-19.

Caterpillar argues, in part:

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Referring first to the Roadtec RX-500 machine in combination with Davis analyzed under claim 2, the resultant machine has a controller that receives signals from leg sensors and regulates the height of the machine to a desired orientation in relation to the roadway surface. The "limiting value" feature is added by Hosseini, which describes a road construction machine (apparatus 10) for raising and lowering an "implement" component relative to the machine. RX-0024, 2:54-56, 3:35-46, FIG. 1; RX-0985C at Q/A 262. Hosseini discloses a controller 30 used to perform these functions. RX-0024 at 6:17. More specifically, the component that Hosseini describes can be raised and lowered to desired positions in response to the extension and retraction of hydraulic cylinders. *Id.*, 2:56-60. Annotated Figure 2 is reproduced below, illustrating the range of motion of the lift assembly. *Id.*, 4:4-37.



RX-0024, Fig. 2

Hosseini further describes certain limiting values (*i.e.*, programmable kickout heights) that designate the maximum upper and lower limits for which the cylinders may be extended and retracted, respectively. *Id.*, 6:16-41, 8:30-38. The purpose of these kickout values is to slowly stop the piston travel before it reaches a mechanical stop, to prevent mechanical shock and potential damage. *Id.* at 11:39-49. Hosseini describes setting these limiting values at least in part based on the angular position of the lift arms and bucket. *Id.*, 3:60-67. Because this angular position of these components is a function of the extension and retraction of the hydraulic cylinders themselves, the limits Hosseini describes directly correspond to the

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linear displacement of the cylinders. *Id.*, 3:60-67, FIG. 2; RX-0985C at Q/A 263.

Caterpillar Br. at 114-15.

Wirtgen argues that Caterpillar “fails to sufficiently explain why a person of ordinary skill in the art would have had a reasonable expectation of success in combining the RX-500 Machine with Davis and Hosseini.” Wirtgen Br. at 117. Wirtgen argues that “Wheel-type loaders [like those disclosed in Hosseini] differ significantly in their modes of operation and serviceability from road milling machines.” *Id.* at 118-19. Wirtgen concludes:

Hosseini does not disclose providing a limiting value for height adjustment of a lifting column. So, even assuming that Hosseini’s kick out heights constitute limiting values, Hosseini fails to disclose providing kick out heights for lifting columns as claimed. CX-0005C (Lumkes Rebuttal WS) Q99; *see* Hearing Tr. 360:5-14. Hosseini’s cylinders, themselves are not lifting columns, and Hosseini does not disclose using lifting columns. CX-0005C (Lumkes Rebuttal WS) Q99; *see* Hearing Tr. 360:5-14. Thus, Hossein fails to disclose the features of claim 5.

The multiple differences among the Hosseini, RX-500, and Davis machines, such as differences in their modes of operation, workloads, precision requirements, and serviceability would preclude a POSA from combining these references as claimed without the benefit of hindsight. CX-0005C (Lumkes Rebuttal WS) Q101.

Id. at 119.

Caterpillar replies that the purpose of the “kickout values in Hosseini is to slowly stop the piston travel before it reaches a mechanical stop, to prevent mechanical shock and potential damage. . . . This is precisely the purpose described in the ‘530 patent (years later) for the claimed ‘limiting value’ in claim 5.” Caterpillar Reply at 32-33 (citing RX-0024 at 11:39-49). Caterpillar argues that “Wirtgen GmbH Managing Director (and engineer) Gunter Hahn admitted” that “the concept of using controllers to stop machine components at virtual limits (or

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set points) within a range of physical movement was known in the early 2000s.” *Id.* at 33 (citing JX-0040C.0016 (Hahn Deposition Transcript) at 60:9-61:9).

Wirtgen replies that:

Hosseini discloses a construction machine with a controller for raising and lowering an implement like a bucket or pallet (not a lifting column). . . . The controller in Hosseini has nothing to do with regulating the position of the machine, or coordinating the raising and lowering of multiple hydraulic cylinders. . . . Rather, it discloses the advantage of slowing down before abruptly stopping when raising or lowering an implement. JX-0003 1:8-12 (‘530 Patent). The controller in Hosseini therefore automatically slows down the movement of the implement prior to completely stopping.

. . .

Hosseini’s “kickout limits and speed controls” are not limiting values for limiting height adjustment, nor are they related to a position regulation system for coordinating multiple lifting columns in a road construction machine. . . . Nothing in the RX-500, Glasson, or Davis brings the teachings of Hosseini any closer to doing so. Hosseini is not clear and convincing evidence that configuring a controller to provide limiting values would have been obvious.

Wirtgen Reply at 37-38.

Having considered the parties’ arguments, the administrative law judge has determined that Hosseini teaches a controller that provides a limiting value for a cylinder that translates linearly, which one of ordinary skill in the art would understand includes a height limitation. *See* RX-0985C (Alleyne WS) at Q/A 261-62 (discussing Hosseini’s kickout heights that “designate the maximum upper and lower limits for which the cylinders may be extended and retracted, respectively.”). One of ordinary skill in the art would be able to apply Hosseini’s teachings to the RX-500, as modified by Davis, given the similarities in designs. *Id.* at Q/A 263-64. Additionally, Hosseini itself says that its embodiments are “useful” in preventing an impact with a lift cylinder. RX-0024 at 11:39-49. Thus, if claim 2 were found to be obvious, the

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administrative law judge would also find claim 5 obvious in light of the RX-500, as modified by Davis, further in view of Hosseini.

H. Obviousness – “Obvious over Roadtec RX-500 (alone or in view of Glasson)” (without Davis)

Caterpillar argues that claim 23 is “Obvious over Roadtec RX-500 (alone or in view of Glasson)[.]” *See* Caterpillar Br. at 77.

1. Claim 22

Caterpillar argues that the “RX-500 expressly satisfies the additional limitation” in claim 22, which depends from claim 1. Caterpillar Br. at 118. Caterpillar argues:

As described above (especially in connection with Element [1.8]), the Roadtec RX-500 has [

)]. *Id.* at Q/A 212; RX-0019.0184 (RX-500 Parts Manual); JX-0045C (Lewis Deposition Transcript) at 135:7-136:5, 70:19-71:12, 36:16-38:18, 38:22:44:5, 42:19-43:7, 43:8-47:10, 46:18-51:11, 52:24-54:19, 51:12-20, 51:21-52:2, 125:4-19; Tr. (Alleyne) at 884:8-897:14. The evidence cited in the previous sentence also shows that the [

]. Accordingly, the requirements of claim 22 are satisfied.

Id. at 118-19.

Wirtgen’s pre-hearing and post-hearing briefs are silent on claim 22. *See generally* Wirtgen Br. at 121-22 (Wirtgen disputes claim 23); Wirtgen Pre-Hr’g Br. at 192-93 (contesting claim 23 but not claim 22).

Caterpillar’s entire reply follows:

Wirtgen does not dispute that Roadtec RX-500 expressly satisfies the additional limitation of unasserted dependent claim 22. *See*

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Wirtgen PostHBr. at 121-22 (disputing claim 23, but not claim 22). Specifically, the Roadtec RX-500 has an indicator device that provides three digital displays: one associated with the position of the front left leg, one associated with the position of the front right leg, and one associated with the position of the back legs. *See* RX-0985C (Alleyne Direct Witness Statement) at Q/A 203-206.

Caterpillar Reply at 34.

In reply, Wirtgen disputes claim 22. *See* Wirtgen Reply at 39 (“Claim 22 thus has three limitations that are missing from the prior art (including the two limitations missing from claim 1, from which claim 22 depends).”). Wirtgen’s counsel did not elicit any testimony from Wirtgen’s expert, Dr. Lumkes, about claim 22. *See* CX-0005C (Lumkes RWS) at Q/A 116-29 (there are no substantive questions or answers about claim 22).

Having considered the parties’ arguments, the administrative law judge has determined that Wirtgen has waived any argument concerning claim 22. *See* GR 11.b. (“Prior art not briefed is waived.”). Additionally, the administrative law judge would find that the RX-500 discloses claim 22, because the RX-500 includes a display that displays the lifting position of three of the legs. *See* RX-0985C (Alleyne WS) at Q/A 203-06. Contrary to Wirtgen’s arguments, claims 1 and 22 do not require sensors to be disposed in four legs. *See* JX-0003 at 7:50-8:13 (claim 1 requires “a plurality of lifting columns”). Accordingly, the administrative law judge finds that Wirtgen has waived any argument concerning claim 22 and that the RX-500 expressly discloses claim 22.

2. Claim 23

For claim 23, which depends from claim 22, Caterpillar argues, in part:

The Roadtec RX-500 expressly satisfies the additional limitation of dependent claim 23. *See* RX-0985C (Alleyne Direct Witness Statement) at Q/A 212. As described above, the Roadtec RX-500 has [

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]). See RX-0985C at Q/A 212; RX-0019.0184 (RX-500 Parts Manual); JX-0045C (Lewis Deposition Transcript) at 135:7-136:5, 70:19-71:12, 36:16-38:18, 38:22:44:5, 42:19-43:7, 43:8-47:10, 46:18-51:11, 52:24-54:19, 51:12-20, 51:21-52:2, 125:4-19; Tr. (Alleyne) at 884:8-897:14. The evidence in the previous sentence also shows that the [].

Thus, the Roadtec RX-500 has [].

]. RX-0985C at Q/A 212. And the machine also has [].

]. *Id.* Thus, the Roadtec RX-500 discloses the limitation in claim 23.G

Caterpillar Br. at 120.

Wirtgen argues:

The RX-500 does not include a digital display that indicates the position for the right rear leg. Rather, the RX-500 includes three digital displays that indicate (1) the position of the front left leg, (2) the position of the front right leg, and (3) the position of the left rear leg. The RX-500 includes three yoyo elevation sensors for the left front, right front, and left rear. RX-0019.0176 (RX-500 Parts Manual). The RX-500 does not include a yoyo elevation sensor for the right rear. And as shown on RX-0020.0004-0005 (RX-500 Schematics), there are only three loop-powered panel meters for indicating elevation. CX-0005C (Lumkes Rebuttal WS) Q118.

Furthermore, the rear lifting elevation cylinders are coupled such that, when these cylinders are not being extended or retracted, the cylinders are in a floating configuration: when one cylinder moves up the other cylinder moves down. RX-0019.0164 (RX-500 Parts Manual); see Hearing Tr. 350:22-351:1. Due to this coupling, the legs are not always at the same position. Accordingly, displaying only the position of the left rear leg on a display does not show the position of the right rear leg. Caterpillar's argument incorrectly assumes that the RX-500 is configured such that when the rear legs are raised or lowered the cylinders move at the same rate. CX-0005C (Lumkes Rebuttal WS) Q120. If the weight distribution of the RX-500 is uneven, then more weight is on the left rear leg than

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on the right rear leg and the left rear leg will raise as a rate slower than the right rear leg. *Id.* Since the legs are raising at different rates, the legs are not at the same extended position. *Id.* Even assuming the machine is on flat land, one cannot determine that both rear legs are at the same height without making numerous assumptions about the machine design. Hearing Tr. 351:10-353:11. And Caterpillar has presented no evidence that those assumptions are satisfied by the RX-500 machine. So again, displaying only the position of the left rear leg on a display does not show the position of the right rear leg.

Wirtgen Br. at 121-22.

Caterpillar replies that “the Roadtec RX-500 has an indicator device that provides three digital displays: one associated with the position of the front left leg, one associated with the position of the front right leg, and one associated with the position of the back legs (the display for the back legs applies to both legs because they are hydraulically coupled together).”

Caterpillar Reply at 34. Caterpillar argues that the display of the rear legs’ height is sufficient because the left and right legs are “tied together.” *Id.* at 34-35. Caterpillar argues that it need only show “that the rear legs of the RX-500 will sometimes (indeed often) be at the same position” to meet its burden. *Id.* at 35.

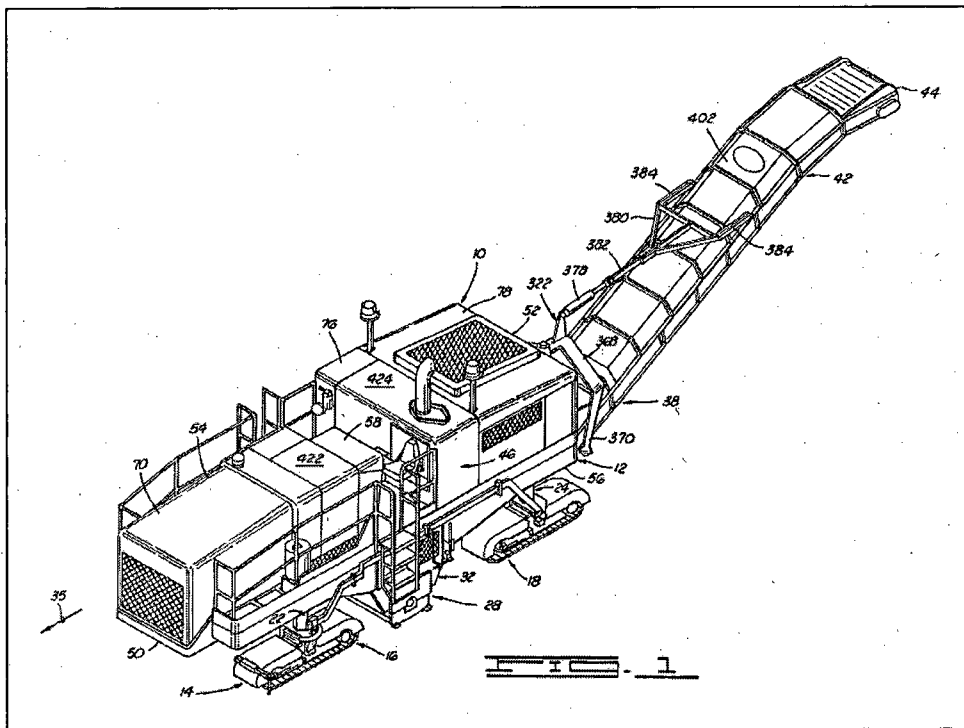
Wirtgen replies that the RX-500 shows just three positions, “not the four positions required by the claims.” Wirtgen Reply at 39. In response to Caterpillar’s argument that the joint display for the rear legs will sometimes be right, Wirtgen argues that “is not a fair reading of the requirement for the display to be operable to show the positions of all four lifting columns. A broken clock is not ‘operable’ twice a day.” *Id.* at 40.

Having considered the parties’ arguments, the administrative law judge has determined that Caterpillar has not shown that the RX-500 expressly discloses an indicator device that displays the lifting position of all four legs. Indeed, the RX-500 displays just three measurements. *See* RDX-0001 (Alleyne Demonstratives) at 25 (annotating RX-0019, RX-500

(SN-101) Parts Manual at ROADTEC000211). Further, Caterpillar does not argue that adding a fourth display would have been obvious. Accordingly, the RX-500 does not disclose the subject matter of claim 23, nor is there a basis for finding the claim obvious.

I. Obviousness – “Swisher in Combination With Glasson”

Caterpillar argues that claims 1 and 2 are obvious over Swisher in Combination with Glasson. *See generally* Caterpillar Br. at 124-31. Swisher (RX-0021) is U.S. Patent 4,325,580. Figure 1 of Swisher shows a road milling machine:



RX-0021, Fig. 1.

Wirtgen argues that Swisher and Glasson “fail to disclose or render obvious every element” of claims 1 and 2. *See generally* Wirtgen Br. at 123-27. Wirtgen does not dispute that Swisher is prior art under 35 U.S.C. § 102(b).

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a) [1.0] 1. A road construction machine

Caterpillar argues that “Swisher discloses a road construction machine, described by Swisher as a ‘planer apparatus.’” Caterpillar Br. at 124.

Wirtgen does not clearly rebut this argument. *See* Wirtgen Br. at 123 (Wirtgen disputes elements [1.8] and [1.9]); Wirtgen Reply at 40 (same).

The evidence shows that Swisher is a road construction machine that is used to mill roads. *See* RX-0985C (Alleyne WS) at Q/A 279-80. Accordingly, the administrative law judge has determined that Swisher is a road construction machine as described in the preamble.

b) [1.1] a machine frame

Caterpillar argues that the “Swisher’s road construction machine (shown in Figure 1 as ‘apparatus 10’) includes a machine frame, described as ‘main frame 12.’” Caterpillar Br. at 124.

Wirtgen does not clearly rebut this argument. *See* Wirtgen Br. at 123 (Wirtgen disputes elements [1.8] and [1.9]); Wirtgen Reply at 40 (same).

The evidence shows that Swisher is a construction machine that has a machine frame. *See* RX-0985C (Alleyne WS) at Q/A 281-82. Accordingly, the administrative law judge has determined that Swisher includes a machine frame, as element [1.1] requires.

c) [1.2] a working drum supported from the machine frame for working a ground surface or traffic surface

Caterpillar argues that Swisher includes a “cylindrical cutter drum,” which is attached to the frame, that constitutes the working drum of element [1.2]. *See* Caterpillar Br. at 124-25.

Wirtgen does not clearly rebut this argument. *See* Wirtgen Br. at 123 (Wirtgen disputes elements [1.8] and [1.9]); Wirtgen Reply at 40 (same).

The evidence shows that Swisher includes a cutter drum (*e.g.*, a working or milling drum), which works ground surfaces, that is supported from the frame. *See* RX-0985C (Alleyne

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WS) at Q/A 283-84. Accordingly, the administrative law judge has determined that Swisher includes the working drum described in element [1.2].

d) [1.3] a plurality of ground engaging supports for supporting the construction machine on the ground surface or traffic surface

Caterpillar argues that Swisher includes four “track assemblies” (and corresponding leg assemblies) that support the machine, thus disclosing element [1.3]. *See* Caterpillar Br. at 83-84; RX-0985C (Alleyne WS) at Q/A 285-86.

Wirtgen does not clearly rebut this argument. *See* Wirtgen Br. at 123 (Wirtgen disputes elements [1.8] and [1.9]); Wirtgen Reply at 40 (same).

The evidence shows that Swisher includes four leg assemblies and four track assemblies that support the machine from the ground. *See* RX-0985C (Alleyne WS) at Q/A 285-86.

Accordingly, the administrative law judge has determined that Swisher includes the plurality of ground-engaging supports described in element [1.3].

e) [1.4] a plurality of lifting columns, each one of the lifting columns being connected between the machine frame and one of the ground engaging supports

Caterpillar argues that Swisher includes four “extendable leg assembl[ies]” that are connected to the machine frame and the tracks. *See* Caterpillar Br. at 125. The legs include hydraulic cylinders that lift the machine. RX-0021 at 40-61.

Wirtgen does not clearly rebut this argument. *See* Wirtgen Br. at 123 (Wirtgen disputes elements [1.8] and [1.9]); Wirtgen Reply at 40 (same).

The evidence shows that Swisher includes four legs that include lifting columns and that the lifting columns are connected between the machine frame and a track. *See* RX-0985C (Alleyne WS) at Q/A 287-88; RX-0021 at 8:40-61. Accordingly, the administrative law judge has determined that Swisher includes the plurality of lifting columns described in element [1.4].

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f) [1.5] each one of the lifting columns including two telescoping hollow column members

Caterpillar argues that Swisher's legs (e.g., the lifting columns) include two telescoping, hollow columns. See Caterpillar Br. at 125-26.

Wirtgen does not clearly rebut this argument. See Wirtgen Br. at 123 (Wirtgen disputes elements [1.8] and [1.9]); Wirtgen Reply at 40 (same).

The evidence shows that Swisher includes lifting columns that each has two hollow, telescoping components and a hydraulic cylinder that lifts the machine. See RX-0985C (Alleyne WS) at Q/A 289-90; RX-0021 at 8:40-61. Accordingly, the administrative law judge has determined that Swisher discloses the subject matter recited in element [1.5].

g) [1.6] at least one piston cylinder unit located within the telescoping hollow column members for adjusting a height of the lifting column so that each one of the lifting columns is adjustable in height relative to the machine frame

Caterpillar argues that each of Swisher's legs includes a hydraulic cylinder that can adjust the leg's height relative to the frame. See Caterpillar Br. at 126.

Wirtgen does not clearly rebut this argument. See Wirtgen Br. at 123 (Wirtgen disputes elements [1.8] and [1.9]); Wirtgen Reply at 40 (same).

The evidence shows that each of Swisher's legs contain a hydraulic cylinder that adjusts the height of the leg such that each leg is adjustable in height relative to the machine frame. See RX-0985C (Alleyne WS) at Q/A 291-92. Accordingly, the administrative law judge has determined that Swisher includes lifting columns that have the two telescoping columns and the piston cylinder described in element [1.6].

h) [1.7] each lifting column having a lifting position corresponding to a position of one of the two telescoping hollow column

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members relative to the other of the two telescoping hollow column members

Caterpillar argues that “the extension and retraction of piston cylinder unit relative to the telescoping tubular members allows the lifting columns to take on particular lifting positions.”

See Caterpillar Br. at 126-27.

Wirtgen does not clearly rebut this argument. See Wirtgen Br. at 123 (Wirtgen disputes elements [1.8] and [1.9]); Wirtgen Reply at 40 (same).

The evidence shows that each of Swisher’s legs has a lifting position that corresponds to the relative positions of the two telescoping, hollow columns. See RX-0985C (Alleyne WS) at Q/A 293-94 (“the extension and retraction of piston cylinder unit relative to these tubular members allows the lifting columns to take on particular lifting positions.”). Accordingly, the administrative law judge has determined that Swisher’s lifting columns have the lifting position described in element [1.7].

- i) ***[1.8] a plurality of lifting position sensors, each lifting position sensor being coupled with elements of one of the lifting columns, which elements are capable of being displaced relative to one another in accordance with the lifting position of the lifting column in such a manner that a signal including information on a current lifting position of the lifting column is produced by the lifting position sensor***

Caterpillar argues that the “combination of Swisher and Glasson” discloses element [1.8].

See Caterpillar Br. at 127. Caterpillar argues, in part:

By incorporating Glasson’s in-cylinder sensor into Swisher’s road construction machine, the combined structure would include an in-cylinder sensor that would produce a signal including information on a current lifting position of Swisher’s modified lifting column. [RX-0022 (Glasson); RX-0985C (Alleyne Direct Witness Statement) at Q/A 295-297]. Swisher discloses a controller (labeled an “elevation control assembly 26”) that provides automatic elevation control frame 12. RX-0021 (Swisher), 18:50-54. The controller includes various lifting position sensors (e.g., “left

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elevation sensor 310”). *Id.*, 18:54-60. The piston cylinder unit is located within the second hollow tubular member, which is itself located within the first hollow tubular member. *Id.*, 8:40-45. The controller controls the hydraulic pistons located within each of the lifting columns, causing them to either extend (to raise the frame) or retract (to lower the frame) as required. *Id.*, 18:60-65.

Id. Caterpillar then refers to its prior arguments about Glasson and concludes that the Swisher-Glasson combination “results in a machine having sensors in the lifting columns, each producing a signal including information on a current lifting position of the lifting column.” *Id.* at 128.

Caterpillar argues that a person of ordinary skill in the art would combine Swisher and Glasson “because the both belong to the same field of endeavor” and concern elevation sensors and hydraulic cylinders. Caterpillar Br. at 128. Caterpillar also argues that Glasson teaches using internal cylinders to protect against harsh environmental conditions. *Id.* Caterpillar concludes that the Swisher-Glasson combination “merely involves combining prior-art elements according to known methods to yield predictable results” and that “a POSITA would have had a reasonable expectation of success for combining Swisher and Glasson.” *Id.* at 129.

Wirtgen argues that this limitation is not obvious because the separate disclosures of Swisher and Glasson do not teach a plurality of sensors. *See* Wirtgen Br. at 123. Wirtgen then argues that Glasson “is not, itself, a lifting column” and thus cannot teach, or contribute to, the disclosure of element [1.8]. *Id.* at 124.

Wirtgen then argues that Swisher and Glasson would not be combined because the “problem Glasson tried to remedy is not applicable to Swisher and would not solve any of the Swisher’s shortcomings.” *Id.* Wirtgen argues that a person of skill would not move Swisher’s external sensors to inside the leg because “Swisher’s external elevation sensors did not have problems due to a ‘harsh environment.’” *Id.* at 125. Wirtgen also contends that modifying Swisher to use internal sensors rather than external sensors “requires a substantial redesign of

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Swisher's grade and slope control system." *Id.* at 125-27 ("the system of Swisher must be drastically modified to determine elevation relative to an external reference using positions of individual hydraulic cylinders, rather than the external side-based sensors described in Swisher that measure an external reference.").

In a section of its Reply titled "Invalidity Based on Swisher," Caterpillar argues:

Wirtgen does not dispute that Glasson describes drawbacks to the use of external sensors and provides an obvious solution (in-cylinder sensors) to overcome these problems. *Id.* at 125. Wirtgen only challenges whether the "harsh environment" was actually a problem in the Swisher design. *Id.* According to Wirtgen, "Swisher's external elevation sensors did not have problems due to a 'harsh environment.'" *Id.* (citing no evidence). But the evidence presented at the hearing shows that a POSITA *would* recognize that moving Swisher's sensors inside the lifting columns would protect them from the outside environment, which includes debris caused by milling operations. RX-0985C (Alleyne Direct WS) at Q/A 273-74. Wirtgen's post hoc argument to the contrary cannot overcome this record evidence.

Furthermore, a POSITA would have known how to successfully combine the in-cylinder sensors of Glasson with the Swisher machine given the extensive teachings in the prior art before 2005. *Id.* at Q/A 275. This combination merely involves the combination of prior-art elements according to known methods to yield predictable results. *Id.* Both features—Glasson's in-cylinder sensors and Swisher's lifting column—were well known in the art at the time of the invention. *Id.* Further, one of ordinary skill would recognize that the in-cylinder sensors of Glasson, when mounted in the hydraulic actuator within Swisher's telescoping lifting columns, would have produced signals indicative of the relative movement of the cylinder and piston of Swisher's hydraulic actuator in the same manner as it did on Glasson's actuator. *Id.*

Caterpillar Reply at 36-37.

Having considered the parties' arguments, the administrative law judge has determined that Swisher and Glasson collectively teach a road-milling machine with a plurality of lifting position sensors as detailed in element [1.8]. *See* RX-0985C (Alleyne WS) at Q/A 296-97. In

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particular, Swisher discloses a machine with four legs having four hydraulic cylinders and Glasson teaches using a sensor to measure the displacement of a hydraulic cylinder. *Id.* at Q/A 296.

However, one of ordinary skill in the art would not have been motivated to modify Swisher in light of Glasson. *See* CX-0005C (Lumkes WS) at Q/A 142. In particular, modifying Swisher's legs and sensors to utilize in-leg sensors would require a substantial redesign of Swisher's controller in order to ensure the combination yielded a functional milling machine. *Id.* Dr. Lumkes testified as follows:

142. Q. Are there any additional reasons?

A. Yes. Modifying Swisher with the alleged teachings of Glasson requires more than simply moving a sensor inside a hydraulic cylinder. Rather, modifying Swisher to operate according to cylinder position sensors rather than external reference sensors requires a substantial redesign of Swisher's grade and slope control system. Swisher's side elevation sensors measure an external reference elevation by using a string line sensor or averaging bar. After this proposed modification, the system of Swisher must be modified to determine elevation according to internal references, namely, positions of individual hydraulic cylinders, rather than the external side-based control described in Swisher.

CX-0005C (Lumkes WS) at Q/A 142. Caterpillar does not answer Wirtgen's argument. *See* Caterpillar Reply at 36-37. Accordingly, the administrative law judge has determined that although Swisher and Glasson disclose the components of element [1.8], Caterpillar has not shown, through clear and convincing evidence, that element [1.8] would have been obvious based on Swisher and Glasson.

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- j) ***[1.9] wherein each of the lifting position sensors is connected to the at least one piston cylinder unit located within its associated lifting column.***

Caterpillar argues that Glasson discloses this element. Caterpillar Br. at 129 (“Each hydraulic cylinder 200 (lifting column) in Glasson includes sensor 218 (lifting position sensor) connected to piston 212 (piston cylinder unit).”).

Wirtgen argues that Glasson does not disclose a lifting column:

Additionally, Glasson doesn’t mention lifting columns for road construction machines. Glasson therefore cannot disclose sensors coupled to lifting columns or to cylinders within the lifting columns, as required by these limitations of claim 1. Caterpillar states that Glasson’s piston is a lifting column, but provides no basis. RX-0985C.0076-77 (Alleyne Direct WS). This piston could have many uses, but it is not, itself, a lifting column as required by the claims. CX-0005C (Lumkes Rebuttal WS) Q138. Even assuming that Glasson discloses these two claim 1 elements, there are substantial reasons not to combine Glasson with Swisher.

Wirtgen Br. at 124.

The evidence shows that Glasson discloses element [1.9]. *See* RX-0985C (Alleyne WS) at Q/A 302-03.⁹⁶ The evidence also shows that Swisher and Glasson collectively disclose this element. *Id.* (“when considering the subject matter of this claim and these references as a whole, the combination of Swisher in view of Glasson discloses this limitation, because by incorporating Glasson’s in-cylinder sensor into Swisher’s road construction machine, the resulting combination would include sensors connected to a piston cylinder unit located within its associated lifting column of Swisher’s modified lifting column.”). Accordingly, the

⁹⁶ While Glasson is not strictly a lifting column in a road milling machine, Glasson fairly discloses this element. *See KSR*, 550 U.S. at 420 (“familiar items may have obvious uses beyond their primary purposes[.]”).

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administrative law judge has determined that Glasson alone and the combination of Glasson and Swisher both disclose element [1.9].

In summary, the administrative law judge has determined that claim 1 would not have been obvious because Caterpillar has not shown that the combination of Swisher and Glasson satisfies element [1.8].

2. Claim 2

Caterpillar argues that the “additional limitations of claim 2 are likewise disclosed by the Swisher-Glasson combination, rendering claim 2 obvious.” Caterpillar Br. at 130. Caterpillar argues:

Swisher discloses a road construction machine with four lifting columns that extend or retract as needed to raise and lower the frame, respectively. RX-0021 (Swisher), 18:50-19:8. A controller (described as the elevation control assembly 26) regulates the height of each lifting column to maintain the frame in a selected spatial orientation relative to the road surface. *Id.*, 3:60-4:11, 18:60-65. That is, as the lifting columns extend and retract, the vertical height of the frame is adjusted accordingly.

The controller also works with multiple lifting sensors located on both sides of the frame (*e.g.*, the “left side elevation sensor 310” in FIG. 3). *Id.*, 18:54-56. This sensor responds to an elevation reference adjacent the left side 56 of the main frame 12. *Id.*, 18:57-60. The controller automatically controls the forward and rear ends of the frame 12 by regulating the lifting positions of the lifting columns at least in part due to the signals from the sensors. *Id.*, 18:50-19:8. Thus, the readings the sensors provide cause the controller to adjust the lift columns. *Id.*; *see also* RX-0120 (4,193,636) (discussing Jakob’s cross-slope and elevation control system). Swisher relies on this disclosure in Jakob describing these elements, illustrating that they were state of the art elements at the time of Swisher’s disclosure). For these reasons, a POSITA would recognize that the Swisher-Glasson combination teaches a controller in accordance with this claim. RX-0985C at Q/A 305-309. Accordingly, Caterpillar has shown by clear and convincing evidence that claim 2 is obvious under 35 U.S.C. § 103.

Id. at 130-31.

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Wirtgen does not clearly rebut Caterpillar's argument that Swisher discloses a controller.

See Wirtgen Br. at 123-27.

Caterpillar replies, in part:

Wirtgen does not dispute that the combination of Swisher and Glasson satisfies all the limitations of claim 2. *See* Wirtgen PostHBr. at 123-27. Instead, Wirtgen only challenges whether there was a sufficient motivation to use the position sensing cylinders of Glasson in the Swisher machine. *Id.*

Caterpillar Reply at 36.

Wirtgen's Reply contests the controller limitation of claim 2:

The combination of Swisher and Glasson also fails to disclose the further limitation of claim 2 that a controller receive signals from the lifting position sensors and regulate the lifting positions of the lifting columns in response to those signals. First, Swisher does not disclose lifting position sensors. CX-0005C (Lumkes Rebuttal WS) at Q148-149. It discloses two sensors, one mounted on either side of the machine. RX-0021.0017 (Swisher) 19:15-19, Fig. 3; CX-0005C (Lumkes Rebuttal WS) Q141. These sensors are not specifically associated with the lifting positions of each of the lifting columns. *Id.* Swisher's sensors measure the elevation of the machine frame relative to the ground, and the elevation control assembly responds to that information. *Id.*

Wirtgen Reply at 42.

Having considered the parties' arguments, the administrative law judge has determined that Swisher discloses a controller that receives signals from its position sensors and that the controller regulates the leg height in response to the signals. *See* RX-0985C (Alleyne WS) at Q/A 308 ("The controller, referred to by Swisher as the elevation control assembly 26, regulates the height of each lifting column to maintain the frame in a selected spatial orientation relative to the road surface."). The testimony that Wirtgen cites relates to the motivation to combine Glasson and Swisher (*e.g.*, Q/A 141) and claim 1 in relation to "the combination of Swisher and

Kleine[.]” *See* CX-0005C (Lumkes RWS) at Q/A 141, 148-49. This does not rebut Dr. Alleyne’s testimony about Swisher’s disclosure of a controller in relation to claim 2.

The administrative law judge further finds that although Swisher discloses a controller, Caterpillar has not sufficiently shown that a person of ordinary skill in the art would modify Swisher’s grade and slope control system in light of Glasson’s sensor-equipped cylinders. *See* CX-0005C (Lumkes RWS) at Q/A 142 (testifying the proposed Swisher-Glasson machine would “require[] a substantial redesign of Swisher’s grade and slope control system.”).

J. Obviousness – “Swisher in Combination With Glasson and Hosseini”

Caterpillar argues that claim 5 is obvious over Swisher in combination with Glasson and Hosseini. *See generally* Caterpillar Br. at 131-33.

1. Claim 5

Caterpillar argues Hosseini discloses the limiting values that are specific to claim 5. *See* Caterpillar Br. at 131-32. Caterpillar also argues that a person of skill in the art would be able to combine Swisher with Hosseini. *Id.* at 132-33.

Wirtgen argues that Hosseini does not disclose the use of limiting values because it “a wheel-type loader that uses hydraulic cylinders to raise and lower an implement, for example, buckets, forks, and other material handling apparatus.” Wirtgen Br. at 128. In its Reply, Wirtgen argues:

Caterpillar’s argument for why Hosseini discloses this element is identical to the argument it made for relying on this reference in the context of the RX-500. Cat. PH Br. at 113-114, 131. The arguments likewise fail for the same reasons: the kickout limits and speed controls of Hosseini are not limiting values for the height adjustment for each of the lifting columns. CX-0005C (Lumkes Rebuttal WS) at Q165-166. These features are not related to lifting columns at all. CX-0005C (Lumkes Rebuttal WS) Q163. They serve an entirely different purpose (cushioning abrupt stops) on a different kind of machine (lifting buckets and pallets). *Id.*

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Caterpillar's obviousness combination thus requires (1) relocating the sensors on Swisher, (2) replacing the sensors with the sensors of Glasson, (3) doubling the number of sensors, (3) changing the information that the sensors convey, (4) completely redesigning the control system of Swisher to work with the new sensors, (5) extracting the concept of set values from Hosseini, (6) modifying those set values to become limiting values for height adjustment, and finally (7) incorporating that limiting value functionality into the control system of Swisher, which did not previously include any such functionality. Caterpillar has not provided clear and convincing evidence that one of skill in the art would go to such great lengths to arrive at the intelligent leg control of the '530 patent, a system directed to solving a problem none of the cited prior art references even hint at recognizing..

Wirtgen Reply at 43-44.

Having considered the parties' arguments, the administrative law judge has determined that Hosseini teaches a controller that provides a limiting value for a cylinder that translates linearly, which one of ordinary skill in the art would understand includes a height limitation. *See* RX-0985C (Alleyne WS) at Q/A 333 ("Hosseini describes controlling a hydraulic implement through certain methods that allow operators to set predetermined limits, such as kickout heights and kickout-modulation-begin heights, to prevent the engagement of a mechanical stop and reduce the overshoot of the lifting column."). One of ordinary skill in the art would be able to apply Hosseini's teachings to Swisher, as modified by Glasson, given the similarities in designs and the desire to prevent damage to the machine. *Id.* at Q/A 337 ("By implementing Hosseini's control system into the combined Swisher-Glasson machine, the resulting combination would include a road construction machine that would improve the machine's ability to gradually slow and stop hydraulic cylinders to prevent damage to the machine. The combination of Hosseini's teachings with the Swisher-Glasson combination merely involves the combination of prior-art elements according to known methods to yield predictable results."). Additionally, Hosseini itself says that its embodiments are "useful" in preventing an impact with a lift cylinder. RX-

0024 at 11:39-49. Thus, if claims 1 and 2 were found to be obvious, the administrative law judge would also find claim 5 obvious in light of Swisher, as modified by Glasson, further in view of Hosseini.

K. Obviousness – “Swisher in Combination With Glasson and Davis”

Caterpillar argues that claims 16, 22, and 23 are obvious over Swisher in combination with Glasson and Davis. *See generally* Caterpillar Br. at 133-37.

1. Claim 16

Caterpillar argues that the additional limitation of claim 16 (*i.e.*, “the controller is configured to raise the lifting columns synchronously to one another”) would have been obvious in view of Swisher, Glasson, and Davis. *See* Caterpillar Br. at 133. Caterpillar argues, in part:

Although the Swisher-Glasson combination does not expressly disclose the controller as being configured to raise the lifting columns synchronously to one another, Davis does. RX-0985C at Q/A 319. Specifically, Davis’s controller operates the front lifting columns with a single control. RX-0023 (Davis), ¶ [0033]. This can occur, for example during the “parameter setting” cycle. At the beginning of this cycle, all lifting columns are raised to their maximum position and subsequently lowered until the cylinder contacts the ground. *Id.*, ¶ [0033, 0041-42, 0045]. This feature is explained in detail above. Based on Davis’s disclosure, a POSITA would only have two ways to carry out the parameter setting cycle: by lifting all the lifting columns synchronously, or by raising them in an asynchronous manner. RX-0023, ¶[0033]; RX-0985C at Q/A 319. One of ordinary skill would have good reason to raise the lifting columns synchronously with another to improve the machine’s stability. RX-0985C at Q/A 319.

Id. at 134.

Wirtgen argues that Davis discloses a “parameter setting” cycle that does not teach raising all of the legs synchronously. Wirtgen Br. at 130-31. Wirtgen also argues that Caterpillar “oversimplifies” the claim by ignoring precision requirements, ground inclination, and weight distribution considerations. *Id.* at 130.

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Having considered the parties' arguments, the administrative law judge has determined that claim 16 would have been obvious in light of Davis (and Swisher). *See* RX-0985C (Alleyne WS) at Q/A 310-11 ("Davis describes the integrated management of cutting parameters for a road construction machine that stores and displays current and preset spatial configurations of the machine."), Q/A 313. Further, as Dr. Alleyne testified, requiring the controller to raise the legs synchronously is clearly an obvious choice to implement when "configuring" the controller. *Id.* at Q/A 250-54. Wirtgen's arguments about the "many factors" that affect synchronous lifting (e.g., precision, the inclination of the ground, and weight distribution in the machine) are not present in the claims or specification. Thus, if claims 1 and 2 are found anticipated and obvious, respectively, the administrative law judge would find that claim 16 would have been obvious in light of Swisher, Glasson, and Davis.

2. Claim 22

Caterpillar argues:

As described, Glasson describes a lifting position sensor and transducer that senses the motion and position of the translation member. The Swisher-Glasson combination, however, does not disclose an indicator device operable to display the lifting positions of each of the lifting columns corresponding to the signals produced by the lifting position sensors. Davis does, however. Specifically, Davis describes an indicator device (described as a "display"), which is used to display lifting positions of lifting columns. RX-0023 (Davis), FIG. 5. The teachings of Davis, including annotated Figure 5, are fully discussed above, and need not be repeated here. In short, Davis discloses lifting position sensors that measure inclination angles and scarification depth and inclination angles relative to the roadbed and transmit these measured values to their respective data processing systems. The signals derived from the lifting position sensors are displayed to the operator on an indicator device (collectively described as displays 161, 171, 191). *Id.*, ¶¶ [0035-37]. A POSITA would recognize that the Swisher-Glasson combination in further view of Davis teaches an indicator device in accordance with this claim. In view of this evidence, a

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POSITA would conclude that this claim is obvious. RX-0985C at Q/A 326-328.

Id. at 135-36.

Wirtgen's pre-hearing and post-hearing briefs are silent on claim 22. *See generally* Wirtgen Br. at 131-33 (Wirtgen disputes claim 23); Wirtgen Pre-Hr'g Br. at 204-05 (contesting claim 23 but not claim 22). In reply, Wirtgen appears to dispute claim 22:

Caterpillar cites Davis for the indicator device operable to display the lifting positions of the lifting columns as recited in claim 22, from which claim 23 depends. Cat. PH Br. at 135. Caterpillar's theory is that one of skill in the art would modify the machine of Swisher to include the display of Davis, which Caterpillar contends displays lifting position data in the context of the Davis reference. Cat. PH Br. 135. But the teachings of Davis do not change the fact that Swisher has no lifting column position data to display. CX-0005C (Lumkes Rebuttal WS) Q177-179. Swisher has two sensors, one on each side of the machine, that measure the position of the frame relative to the ground. RX-0021.0017 (Swisher) 19:15-19, Fig. 3. These sensors do not generate signals related to the lifting positions of the lifting columns. CX-0005C (Lumkes Rebuttal WS) Q177-179.

See Wirtgen Reply at 45. Wirtgen's counsel did not elicit any testimony from Wirtgen's expert, Dr. Lumkes, about claim 22. *See* CX-0005C (Lumkes RWS) at Q/A 176-82 (there are no substantive questions or answers about claim 22).

Having considered the parties' arguments, the administrative law judge has determined that Wirtgen has waived any argument concerning claim 22. *See* GR 11.b. ("Prior art not briefed is waived."). Additionally, the administrative law judge would find that the Swisher-Glasson-Davis discloses the subject matter of claim 22 and that the claim is obvious. *See* RX-0985C (Alleyne WS) at Q/A 326-28. Dr. Alleyne's testimony is un rebutted. *See* CX-0005C (Lumkes RWS) at Q/A 176-82 (there are no substantive questions or answers about claim 22).

3. Claim 23

Caterpillar's entire argument is:

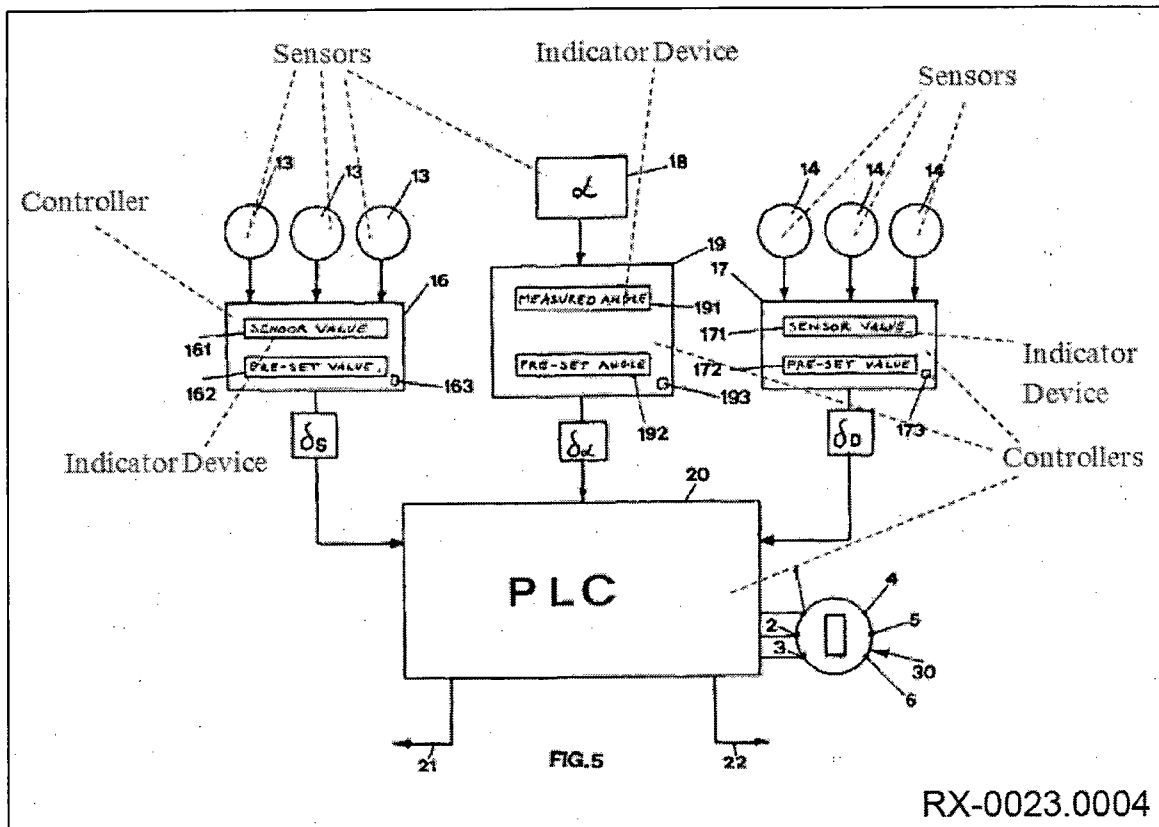
The Swisher describes a road construction machine that includes ground engaging supports connected to the underside of the machine's frame through four lifting columns. Specifically, Swisher's machine includes a first front column (22), a first rear column (24), a second front column (144), and a second rear column (146). RX-0021 (Swisher), 3:60-4:5, 9:28-31. Glasson discloses a lifting column that includes a piston cylinder unit and cylinder enclosure. Despite this, the Swisher-Glasson combination does not disclose an indicator device operable to display the lifting positions of the two front lifting columns and two rear lifting columns a lifting column including a piston cylinder unit and cylinder enclosure. As described in greater detail above, Davis describes an indicator device and multiple sensors (13, 14, 18). RX-0023 (Davis), ¶¶[0035-37]. Each of these sensors collects measurements and transmits readings to a controller (specifically, each of their respective data processing systems 16, 17, 19) for use on an indicator device display (collectively, displays 161, 171, 191). The Swisher-Glasson combination already results in a sensor integrated in each lifting column, and the addition of Davis would further result in a machine that displays the position of the two front and two rear lifting columns on an indicator device. RX-0985C (Alleyne Direct Witness Statement) at Q/A 329-331. Thus, a POSITA would recognize that Swisher, Glasson, and Davis in combination teach a machine with two front and two rear lifting columns and an indicator device for displaying the lifting positions of each of these lifting columns in accordance with this claim, and thus render claim 23 obvious.

Caterpillar Br. at 136-37.

Wirtgen argues that Swisher-Glasson-Davis "fail to disclose or render obvious the indicator device is operable to display the lifting positions of the two front lifting columns and two rear lifting columns," as recited in claim 23." Wirtgen Br. at 132. Wirtgen also argues that "Caterpillar does not articulate any reason or motivation" to combine the references. *Id.* at 132-33.

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Having considered the parties' arguments, the administrative law judge has determined that Caterpillar has not shown that Swisher-Glasson-Davis expressly discloses an indicator device that displays the lifting position of all four legs. Indeed, Davis displays two sensor values and one "measured angle." Dr. Alleyne's demonstrative shows this:



RDX-0001 (Alleyne Demonstratives) at 30. Further, Caterpillar does not argue that adding a third and fourth display would have been obvious. Accordingly, Swisher-Glasson-Davis does not disclose the subject matter of claim 23, nor is there a basis for finding the claim obvious.

L. Obviousness – Secondary Considerations

1. Copying

Wirtgen argues that Caterpillar's PM600 and PM800 machines "are direct copies of Wirtgen America's intelligent leg control disclosed and claimed in the '530 patent." Wirtgen Br. at 133.

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Caterpillar argues, in part, that []]. Caterpillar Br. at 138. Caterpillar also argues that its system [], which is not part of the '530 Patent. *Id.* Caterpillar also argues that Wirtgen has not established a nexus between features identified in []) and the '530 Patent. *Id.* at 139. Caterpillar also argues that raising all four legs synchronously (per claim 16) was a feature in Caterpillar's PM-465, and thus was not copied from Wirtgen's machines. *Id.*

Having considered the parties' arguments, the administrative law judge has determined that Wirtgen has presented some evidence of copying. The evidence shows that Caterpillar []

[]. The documentary evidence also shows that []

[]. See CX-0564C (CPLN Trade-Off Kick-Off) at 107; Engelmann Tr. 687-688; CX-0568C (PM600 Hydraulics Presentation) at 3, 5; CX-0307C (NPI Manual) at 47. Wirtgen, however, does not address the software in the Caterpillar machines, which Mr. Engelmann testified was developed by Caterpillar. See Engelmann Tr. 744.

2. Commercial Success

Wirtgen's entire argument is:

The '530 patent relates to intelligent leg control, which is a technical feature of the DI milling machines having height-sensing lifting columns. CX-0005C (Lumkes Rebuttal WS) Q250. This feature allows precise control of the machine's slope, pitch, and cut depth during operation. This feature also allows an operator to precisely return to the previous cut depth after avoiding an obstacle, such as a manhole cover. CX-0005C (Lumkes Rebuttal WS) Q251. This feature allows for significant efficiency gains and therefore

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improved productivity. It also allows for more precision in milling operations because the positional information provided to the operator allows for swift, precise control of each leg. These attributes are important to purchasers of road milling equipment. CX-0005C (Lumkes Rebuttal WS) Q252.

Marketing materials for Wirtgen's W 210i cold milling machine (series 1520) identify several leveling features among the "outstanding features" of the machine, including a "large choice of sensors and highly precise control of the milling depth," "[s]urface irregularities are leveled out by the machine's four hydraulically interlinked lifting columns," that it "takes quite a lot to throw the W 210/W 210i off balance," and that "the four-fold full-floating axle that forms part of the PTS [Parallel-to-Surface] system quickly and reliably compensates for any irregularities transverse to the direction of travel," all of which relate to the '530 Patent. CX-0005C (Lumkes Rebuttal WS) Q254-256; CX-0009C (Mulhern Rebuttal WS) Q57-59; CX-0176.0025 (W210-W210i Brochure); CX-0569C.0002, .0005 (W100-130CFi Brochure).

Wirtgen Br. at 137-38.

Caterpillar argues:

Wirtgen's assertion that the '530 patent' has led to commercial success for its machines is also unsupported by evidence. Neither Wirtgen, Dr. Lumkes, nor Ms. Mulhern provides specific evidence showing a nexus between the alleged commercial success of its products and the *specific features* recited in claims 2, 5, 16, and 23 of the '530 patent. Without this showing, Wirtgen's alleged commercial success has no legal bearing on the question of whether claims 2, 5, 16, and 23 of the '530 patent are obvious. For example, Wirtgen provides direct testimony from Dr. Lumkes suggesting that the '530 patent has a feature that "allows precise control of the machine's slope, pitch, and cut depth during operation" and "more precision in milling operation." CX-0005C at Q/A 254-256; CX-0009C at Q/A 49. After learning that [

], Wirtgen dropped claim 15 from the lawsuit, which required a controller to "regulate the working depth of the working drum."

Further, Ms. Mulhern's analysis misses the mark because she attributes commercial success to the wrong sensors. In particular, the evidence she relies on touts "intuitive, precise leveling resulting from new hydraulic cylinders at the side plates." Tr. (Mulhern) at

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105:12-186:4 [*sic*, 185:12-186:4]. But the hydraulic cylinders claimed in the '530 patent are in the lifting columns, not the side plates. For these reasons, the alleged commercial success evidence Wirtgen cites does not relate to any of the asserted claims remaining in this Investigation, let alone the portion of an asserted claim that Wirtgen allegedly invented. Accordingly, Wirtgen has failed to establish "commercial success" as a relevant secondary consideration for these claims.

Caterpillar Br. at 140.

Wirtgen's entire reply comingles commercial success and industry acclaim:

Caterpillar argues a lack of nexus again for commercial success and industry praise. Again, ample evidence in the record supports a nexus between the asserted claims of the '530 patent and the popularity of Wirtgen America's machines in the marketplace. CX-0556 (World Highways—Wirtgen milling machines and soil stabilisers land in Sardina) (praising the display recited in claim 23: "It enables us to concentrate and have everything under control at all times, despite the complexity of the mechanical, hydraulic and electronic systems. This is where the LEVEL PRO leveling system and hydraulic sensors for measuring the milling depth offer genuine added value."); CX-0566C.0025 Row 18 (Controls & Electrical Ideas Review) ("[]"); CX-0566C.0013 Row 276 (Controls & Electrical Ideas Review) ("[]"); Hearing Tr. 692:2-14 (Engelmann ([])); CX-0030C (PM600 GW2) ([]).

Wirtgen Reply at 48.

Having considered the parties' arguments, the administrative law judge has determined that Wirtgen has made a modest showing that its products were a commercial success due to the features described in the '530 Patent.⁹⁷ In particular, Wirtgen has shown that features related to the claims generally appear in its advertising and that customers in the industry value the

⁹⁷ For the '530 Patent, the parties do not specifically address the sales volumes or revenue associated with the Wirtgen machines. Thus, the commercial success with respect to the volume and revenue of the products is not contested.

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increased milling efficiency that the claims help realize. *See* CX-0005C (Lumkes WS) at Q/A 252; CX-0009C (Mulhern RWS) Q/A 57-59; CX-0176 (W210-W210i Brochure) at 25; CX-0569C (W100-130CFi Brochure) at 2, 5; *see also Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1055 (Fed. Cir. 2016) (“It is likewise reasonable to conclude that advertising that highlights or focuses on a feature of the invention could influence customer purchasing decisions.”). Wirtgen’s showing, however, is not particularly strong because there is scant evidence that consumers purchased the machines because of this feature.⁹⁸ For example, Dr. Lumkes’ opinion about the importance of this feature is unsupported (Dr. Lumkes is not relying on his personal knowledge of the milling machine industry, and the testimony is unrelated to his technical expertise), and Dr. Mulhern’s opinion relies on Dr. Lumkes’ opinion. *See* CX-0005C (Lumkes WS) at Q/A 256; CX-0009C (Mulhern RWS) Q/A 57-59. Further, the []⁹⁹ do not offer strong support for Wirtgen’s argument, because the survey focuses on the concept of “[],” which is not readily attributable to claims 1, 2, 5, 16, 22, or 23.¹⁰⁰ Additionally,

⁹⁸ For example, Mr. McEvoy, Wirtgen America’s CEO, testified that customers buy Wirtgen products because its machines include a “number of” features and because of Wirtgen America’s (claimed) superior product support. *See* CX-0003C (McEvoy WS) at Q/A 25 (testifying that customers buy Wirtgen products because “. . . Second, Wirtgen America’s product support is the best in the industry.”); *see also* CX-0008C (Mulhern WS) at Q/A 102 (discussing 23,500 technical support calls received since 2014); CX-0002C (Schmidt WS) at Q/A 69 (explaining that Wirtgen’s technical support is available 24 hours a day, seven days a week and that “As soon as Wirtgen America receives a communication from a customer, the technical staff put the wheels in motion to address the issue.”); RX-0989C (Reed RWS) at Q/A 150 (Wirtgen has been the leading supplier of milling equipment for decades.”), Q/A 155-56 (“Ms. Mulhern has not shown a temporal link between sales growth and the patented features.”).

⁹⁹ Wirtgen’s commercial success argument cites to CX-0005C (Lumkes RWS) at Q/A 250-51. This in turn, cites to “CX-0567C.0023 Row 304 (W210 Ranked Features List).”

¹⁰⁰ Wirtgen has argued it is entitled to a presumption on nexus. *See* Wirtgen Br. at 197 (addressing the ‘641 Patent). However, the very authority it cites, *WBIP v. Kohler*, says that there is no presumption “where the patented invention is only a component of the product to

the administrative law judge notes that the connection between Wirtgen's advertising and the features recited in claims 1, 2, 5, 16, 22, and 23 appears more tenuous than Apple's advertising of the patented slide-to-unlock feature of an iPhone. *See Apple*, 839 F.3d. at 1056 (When discussing the commercial success of the iPhone's slide-to-unlock feature, the Federal Circuit noted that "[i]t is the fact finders' job to assess the probative value of the evidence presented."). Accordingly, the administrative law judge has determined that the evidence Wirtgen has presented is slightly probative of commercial success.

3. Industry Acclaim and Praise of Others

Wirtgen argues:

The intelligent leg control of the '530 patent is another example of the user-friendly technology for which Wirtgen America has received widespread recognition from its customers and others in the industry, further evidencing the nonobviousness of the patented features. For instance, *Heavy Equipment Guide* interviewed several Wirtgen customers in an article titled, "Milling service provider turns to Wirtgen for premium equipment," published June 13, 2017. The article states that "[t]hey are clearly much more user-friendly than other machines." CX-0495C.0003 (*Heavy Equipment Guide Article*).

Claim 23 of the '530 patent specifically relates to a display that communicates the machine position through the heights of the lifting columns. *World Highways* published an article about a large milling project and interviewed Attilio Demuro, a cold milling operator. CX-0556 (*World Highways – Wirtgen milling machines and soil stabilisers land in Sardina*). The article states that Mr. Demuro "praised the machine's easy-to-understand display. 'It enables us to concentrate and have everything under control at all times, despite the complexity of the mechanical, hydraulic and electronic systems. This is where the LEVEL PRO leveling system and hydraulic sensors for measuring the milling depth offer genuine

which the asserted objective considerations are tied." *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1329 (Fed. Cir. 2016). Because the "intelligent leg" is a component of the machine, and is not coextensive with the machine, Wirtgen is not entitled to a nexus presumption.

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added value.” CX-0556.0002-3 (World Highways - Wirtgen milling machines and soil stabilisers land in Sardina).

[
]. CX-0571C
(Partial VOC List); CX-0566C (Controls & Electrical Ideas Review). [

].” CX-
0593C.0012 (PM600 GW Launch Review). [

].”
CX-0593C.0012 (PM600 GW Launch Review).

Wirtgen Br. at 138-39.

Caterpillar argues:

Wirtgen’s assertion that the ‘530 patent has led to industry praise for its machines is also unsupported by evidence. Neither Wirtgen, Dr. Lumkes, nor Ms. Mulhern provides specific evidence showing a nexus between the alleged industry praise of its products and the specific features recited in claims 2, 5, 16, and 23 of the ‘530 patent. Without this showing, Wirtgen’s alleged industry praise has no legal bearing on the question of whether claims 2, 5, 16, and 23 of the ‘530 patent are obvious. For example, Wirtgen provides direct testimony from Dr. Lumkes suggesting that a customer praised Wirtgen’s invention because the “LEVEL PRO leveling system and hydraulic sensors for measuring milling depth offer genuine added value.” CX-0005C (Lumkes Rebuttal WS) at Q/A 261. This evidence fails because, again, after learning that [

], Wirtgen dropped claim 15 from the lawsuit, which required a controller to “regulate the working depth of the working drum.” The alleged praise evidence that Wirtgen cites does not relate to any of the asserted claims left, let alone to the portion of an asserted claim that Wirtgen allegedly invented. Accordingly, Wirtgen has failed to establish “industry praise” as a relevant secondary consideration for these claims.

Caterpillar Br. at 57-58.

Having considered the parties’ arguments, the administrative law judge has determined that Wirtgen has not shown that others in the industry praised the features recited in claims 2, 5,

16, 22, and 23. The testimony and evidence that Wirtgen cites is not related to the “intelligent leg control” that Wirtgen ties to the ‘530 Patent. In the *Heavy Equipment Guide* article, CX-0495C, the sentences immediately following the “user-friendly” accolade discusses error messages and machine noise. *See* CX-0495C at 3. The next four paragraphs discuss reduced odor, ergonomics, lighting, and a camera system. *Id.* In the *World Highways* article, a machine operator praised Wirtgen’s “easy-to-understand” display, which is not captured by the asserted claims (Indeed, a display that is very difficult to understand could also infringe or practice the asserted claims). *See* CX-0556 at 2-3. Accordingly, Wirtgen has failed to show that others praised the particular legs and controller (*e.g.*, the “intelligent legs”) claimed by the ‘530 Patent.

4. Weighing the Secondary Considerations

On the whole, the administrative law judge has determined that the secondary considerations do not provide a material rebuttal to an obviousness argument, as the evidence of copying and commercial success is modest and the “praise of others” evidence does not support Wirtgen’s arguments. In any event, a rebuttal is not necessary because Caterpillar has not shown that the asserted claims are *prima facie* obvious. *See Transocean, supra.*

M. Indefiniteness

Caterpillar argues that “the ALJ should find that claims 2, 5, and 16 are indefinite because the ‘530 specification fails to disclose corresponding structure for performing the claimed function of claim 2[.]” Caterpillar Br. at 141. Caterpillar’s indefiniteness argument rests on finding that the “controller” term of claim 2 is subject to 112, ¶ 6. *See* Caterpillar Br. at 141-45; *see also* Caterpillar Reply at 40 (same).

The administrative law judge previously determined that the “controller” term refers to a standard controller, such as a PLC (programmable logic controller), and that the term controller”

is not functionally claimed.¹⁰¹ Indeed, Caterpillar presented extensively argument that the “controller” was a well-known structure. *See* Caterpillar Br. at 106 (“Indeed, by September 2005, there were already several “off-the-shelf” control systems that were well known and used for providing automatic height correction without the need for manual operator control, including systems from MOBA and Topcon.”); *see also* Caterpillar Reply at 30 (“Wirtgen does not dispute that in 2005, it was a well-known feature of most controllers that two or more of the machine’s legs could be raised simultaneously by the operator.”). Accordingly, the administrative law judge finds that Caterpillar has not shown that claims 2, 5, or 16 are indefinite for failing to disclose an algorithm for performing the functions that Caterpillar identified.

VIII. Domestic Industry – Economic Prong

Wirtgen, in general, argues that “Wirtgen America has satisfied the domestic-industry requirement under 19 U.S.C. § 1337(a)(3)(A) and (B).” Wirtgen Br. at 261. Wirtgen introduces its domestic activities as follows:

Wirtgen America has made significant domestic investments to service and support products that practice the Asserted Patents. These investments relate to the following domestic activities: (i) post-importation customization, (ii) service and repair, (iii) technical support, (iv) warranty support, and (v) technical training. CX-0008C (Mulhern Opening WS) Q72-Q124; CDX-0004C (Mulhern Direct Demonstrative) at CDX-0004C.4; Hearing Tr. 432:9-25.

Id. at 263.

Caterpillar, in general, argues that:

- Wirtgen America’s domestic activities are insignificant, especially in comparison to Wirtgen GmbH’s activities – *see* Caterpillar Br. at 280-83, 286-93;

¹⁰¹ The “controller” of the ‘530 Patent differs from the controller claimed in the ‘641 Patent given the different specifications, the respective usage of the term “controller” in each patent, and Caterpillar’s extensive arguments that the “controller” in the ‘530 Patent was well-known.

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- Wirtgen America has a weak relationship to the asserted patents, which were acquired only a few months before the complaint was filed – *see* Caterpillar Br. at 283-84;
- A host of Wirtgen America's investments are attributable to Wirtgen GmbH – *see* Caterpillar Br. at 284-86;
- Wirtgen America's reliance "on qualitative factors" such as customization, complex customer support issues, warranty expenses, and training are overstated in importance – *see* Caterpillar Br. at 293-95.

Caterpillar concludes that Wirtgen America's investments and expenses are quantitatively and qualitatively insignificant, per *Lelo Inc. v. Int'l Trade Comm'n*, 786 F.3d 879 (Fed. Cir. 2015).

See Caterpillar Br. at 293, 295.

The record shows that with respect to the asserted patents, Wirtgen's domestic investment and employment are small relative to Wirtgen's larger overseas activities, which include manufacturing of the machines covered by the asserted patents. The administrative law judge has taken that fact into consideration. Yet, Wirtgen's domestic investments and employment are significant with respect to articles protected by the asserted patents, both quantitatively in terms of the dollars spent, physical plant and workers employed, and qualitatively because they permit and enhance Wirtgen's sales, distribution and maintenance of domestic industry products and the related employment of workers in the United States. Thus, as discussed below, the administrative law judge finds that Wirtgen satisfies the economic prong of the domestic industry requirement of section 337.

A. Investment in Plant and Equipment

Wirtgen argues:

Wirtgen America has also invested in plant and equipment associated with the post-importation modifications, field service and repair, technical support, warranty, and technical training activities involving the DI Products. The plant and equipment investments include investments in Wirtgen America's corporate headquarters,

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workshop equipment, field-service equipment, the CTT, and CTT Equipment. CX-0008C (Mulhern Opening WS) Q128.

Wirtgen Br. at 272. Wirtgen relies on the following physical spaces:

- The workshop, which is “used for post-importation manufacturing [and] occupies 16,740 square feet of the total headquarters” – *see* Wirtgen Br. at 273;
- The supply center, which is “used to store parts for post-importation manufacturing as well as post-sale service and support activities, is 86,190 square feet” – *see* Wirtgen Br. at 273;
- 7,0000 square feet for “technical-support staff” – *see* Wirtgen Br. at 273;
- 400 square feet for “Wirtgen America’s warranty support-staff” – *see* Wirtgen Br. at 273-74;
- Wirtgen’s “Center for Technical Training” (“CTT”), which includes “a five-acre demonstration and proving ground where customers and dealers learn to operate the milling machines efficiently and safely, as well as a four-bay workshop where service classes receive hands-on experience in maintenance and basic repair of the milling machines” – *see* Wirtgen Br. at 265

Wirtgen then references the following allocated investments and expenses:

- \$[] for “[i]nvestments in the assets of the corporate headquarters;”
- \$[] for “operating expenses allocable to the DI Products” related to its corporate headquarters;
- \$[] for “investment in workshop equipment that can be attributed to the DI Products;”
- \$[] for “field-service equipment allocable to the DI Products;”
- \$[] for “investments in the assets of the CTT;”
- \$[] for “investments in the CTT associated with technical training results in CTT-related expenses allocable to the DI Products;”
- \$[] for “CTT equipment [attributable] to the DI Products” (e.g., furniture, IT equipment, and training tools); and
- [] million for “three DI milling machines (a W 210i, a W 250i, and a W 130i) used for training at the CTT and representing an investment by Wirtgen America of approximately \$[] for their acquisition and maintenance.”

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Wirtgen Br. at 272-79. Wirtgen concludes:

In total, for all DI Products, Wirtgen America's allocated investments from 2014 through June 2017 are \$2.3 million, in addition to assets whose allocated book value as of June 30, 2017 is \$2.0 million. CX-0008C (Mulhern Opening WS) Q258. These investments and the allocation methodology used to arrive at these investments are undisputed. *See* RX-0989C (Reed Rebuttal WS) Q42; Hearing Tr. 430:15-431:1 (Reed). And these investments are both qualitatively and quantitatively significant. CX-0008C (Mulhern Opening WS) Q333-Q378. Thus, these investments satisfy the domestic-industry requirement of 19 U.S.C. § 1337(a)(3)(A).

Id. at 279.

Caterpillar argues:

Wirtgen's superficial analysis avoids quantifying what value is added in the United States because any way that value is analyzed, it is insufficient. Even at a high level, Wirtgen contends that its total investments over a 3.5 year period in plant and equipment for the domestic industry milling machines are approximately \$2.3 million, in addition to assets with a book value of \$2.0 million. CX-0008C at Q/A 32. Wirtgen's claimed total of \$4.3 million over a 3.5 year period is insignificant compared to Wirtgen America's sales of the DI milling machines of the same period (\$[] million from 2014 through the first half of 2017, according to CX-0008C at Q/A 61). It is also insignificant compared to the cost of goods—what Wirtgen America paid to Wirtgen GmbH to purchase the alleged DI products over the same period (over \$[] million based on an estimated []% cost of goods)—and truly insignificant compared to the investments made by Wirtgen GmbH in research, development, manufacturing, and customer support and service expertise, reflected in the high costs of goods Wirtgen America pays to Wirtgen GmbH.

Wirtgen also contends it satisfies subsection (B) for investments in labor and capital based on an alleged 3.5 year total of \$8.24 million in labor and capital investments. A large portion (\$[] million) of this expense is associated with the disputed warranty labor addressed above. CX-0008C at Q/A 259. Further, Wirtgen's claimed totals are insignificant compared to the [] dollars Wirtgen has paid to purchase the DI milling machines (Wirtgen's cost of goods), the [] dollars in revenue from the sale of those machines by Wirtgen

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America, and the vast investments in Germany to manufacture the DI milling machines and parts, provide technical support, train U.S. workers in Germany, and even provide marketing for the U.S. market.

Even taking Wirtgen's recalculated domestic industry investments into the equation, they are an insignificant fraction of the cost of the goods paid to Wirtgen GmbH. *See Lelo*, 786 F.3d at 882, 885. When a quantitative analysis establishes an insignificant level of investment, there is no economic prong of domestic industry. *Sleep-Disordered Breathing*, Inv. 337-TA-890, at 29. In this Investigation, the numbers simply do not support a finding of domestic industry.

Caterpillar Br. at 292.

The administrative law judge has determined that the facility and equipment expenses that Wirtgen relies on are significant under § 337(a)(3)(A). To begin, the physical outlay of Wirtgen America's headquarters and the CTT is large. *See CX-0008C (Mulhern WS)* at Q/A 126, 130, 141-48, 116-18, 213. The investment in Wirtgen America's headquarters (\$[]) and the CTT (\$[]) is significant. *Id.* at Q/A 178, 240; *see also CX-0004C (Mulhern Demonstratives)* at 7 (summarizing investments). Further, the operating expenses attributable to the DI products and Wirtgen America's headquarters (\$[]) and the CTT (\$[]) is significant. *Id.*¹⁰² Ms. Mulhern's sales allocation ensures that the investments, as Wirtgen relies on them, are related to the asserted patents. *See, e.g., CX-0008C (Mulhern WS)* at Q/A 176-77, 205, 210, 231, 240, 249-50 (discussing allocation methodologies). *See Certain Air Mattress Systems, Components Thereof and Methods of using the Same*, Inv. No. 337-TA-971, Comm'n

¹⁰² Wirtgen America's expenses of "including three DI milling machines (a W 210i, a W 250i, and a W 130i) used for training at the CTT and representing an investment by Wirtgen America of approximately \$[] for their acquisition and maintenance" (*see Wirtgen Br. at 278*) may be significant, although the administrative law judge has not relied on this investment/expense in reaching the conclusion because Wirtgen's attempt to include this number by "apportion[ing] by 33%" is premised on an unsupported assumption that the W130i is 33% of the cost of the other machines.

Op. at 45 (May 17, 2017) (finding investments in plant and equipment were significant where the “record shows that all of the investments relied on by Complainants are made with respect to the articles protected by the patent[.]”). The investments and expenses are also significant insofar as the facilities are used to train customers in using the machines and insofar as they support Wirtgen’s service activities, which are essential to reducing downtime, which customers value. See CX-0008C (Mulhern WS) at Q/A 337-42, 344, 351.¹⁰³ Thus, Wirtgen America’s investments in plant and equipment are significant both quantitatively and qualitatively. See also *Backlight Modules, supra*.

B. Labor or Capital

Wirtgen argues, in part:

Wirtgen America has also made significant investments in labor and capital. For all DI Products, Wirtgen America’s allocated labor and capital investments from 2014 through June 30, 2017 are \$8.2 million. CX-0008C (Mulhern Opening WS) Q259. These labor and capital investments include investments in post-importation modifications (workshop and supply center labor), field service activities (labor and travel expenses), technical support labor, warranty activities (support labor and reimbursements to dealers), training labor, and a cold milling specialist. CX-0008C (Mulhern Opening WS) Q260.

Wirtgen Br. at 279. Wirtgen then references the following expenses, which were incurred from January 1, 2014 through June 30, 2017:

- \$[] in “workshop labor” – see Wirtgen Br. at 280;
- \$[] in “supply center labor” – see Wirtgen Br. at 280;

¹⁰³ Although Caterpillar has identified instances in which Wirtgen GmbH has assisted with technical support, the rate of assistance is miniscule. Further, Wirtgen America’s facilities are essential to its support operations, as attempting to conduct Wirtgen America’s support activities from another country is likely commercially unfeasible if not impossible. Indeed, Caterpillar’s Reply acknowledges that providing service across “physical distance” could be a challenge. See Caterpillar Reply at 94.

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- \$[] in “field service labor” – *see* Wirtgen Br. at 281;
- \$[] in “field service travel expenses” – *see* Wirtgen Br. at 281;
- \$[] in “technical support labor” – *see* Wirtgen Br. at 282;
- \$[] in “warranty support staff” and travel reimbursements – *see* Wirtgen Br. at 282;
- \$[] in “reimbursements to dealers for warranty claims on Wirtgen-brand machines” – *see* Wirtgen Br. at 282;¹⁰⁴
- \$[] for “estimated labor expenses associated with technical training for the DI products” – *see* Wirtgen Br. at 282;
- \$[] for “the compensation and benefits paid by Wirtgen America to six training staff employees that work in the CTT” – *see* Wirtgen Br. at 283; and
- \$[] for a “cold milling product support manager” – *see* Wirtgen Br. at 284.

See also CDX-0004C (Mulhern Demonstratives) at 8. From January 1, 2014 to June 30, 2017, Wirtgen argues that the workshop had 16-19 employees, the supply center had 24-39 employees, and that 26-31 employees were devoted to technical support. Wirtgen Br. at 279-81 (citing CX-0008C (Mulhern WS) at Q/A 262, 269, 291). Wirtgen concludes:

... For all DI products that practice one or more of the Asserted Patents, Wirtgen America’s allocated investments from 2014 through June 30, 2017 are \$8.2 million. CX-0008C (Mulhern Opening WS) Q332; CX-0366C (WAI Investments by Patent); CX-0462C (WAI Allocation for Milling Machine Workshop Orders for ‘530, ‘340, ‘309Products). These investments and the allocation methodology used to arrive at these investments are undisputed. *See* RX-0989C (Reed Rebuttal WS) Q42; Hearing Tr. 430:15-431:1 (Reed). And these investments are both qualitatively and quantitatively significant. CX-0008C (Mulhern Opening WS) Q333-Q378. Thus, these investments satisfy the domestic-industry requirement of 19 U.S.C. § 1337(a)(3)(B).

¹⁰⁴ The nature of these expenses has not been sufficiently explained to determine that they should be included in the analysis. It also appears that Wirtgen’s expert did not rely on this figure in her analysis. *See* CX-0008C (Mulhern WS) at Q/A 333.

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Wirtgen Br. at 284-85.

Caterpillar, in general, argues that:

- “Wirtgen America’s investments are insignificant when they are properly assessed with respect to the nature of the activities and how they are significant to the articles protected by the intellectual property right.” – *see* Caterpillar Br. at 281 (quotation of *Certain Printing and Imaging Devices and Components Thereof*, Inv. No. 337-TA-690, Comm’n Op. (Feb. 17, 2011) omitted);
- “Wirtgen America avoids any true quantitative analysis” of its domestic activities in relation to “the product value that is initially created in Germany” – *see* Caterpillar Br. at 281-82, 286;
- The value that Wirtgen America adds to the machines is small – *see* Caterpillar Br. at 282, 286-87, 289-91;
- “Wirtgen America merely engages in the typical sales and service activities of a subsidiary” – *see* Caterpillar Br. at 282;
- Wirtgen America did not establish a connection between its activities and the asserted patents – *see* Caterpillar Br. at 282, 288-89;

Caterpillar also argues that Wirtgen’s qualitative arguments rely on unreliable information, that Wirtgen GmbH is responsible for supporting Wirtgen America’s efforts, and that the majority of Wirtgen America’s sales are “salable” immediately upon importation. *See* Caterpillar Br. at 293-95.

Wirtgen replies that Caterpillar’s arguments regarding Wirtgen GmbH “are irrelevant” and faults Caterpillar for citing “no case law that would make any of [Caterpillar’s] rhetoric relevant.” Wirtgen Reply at 88. For warranty labor investments, Wirtgen argues that it “is relying on reimbursements for the labor performed for warranty repairs, not payments for components for assembly into a final product.” *Id.* at 89. Wirtgen then responds to Caterpillar’s critiques. *Id.* at 90-95. In particular, Wirtgen America contends that its “support activities are critically important” given customer demands for reliability. *Id.* at 90. Wirtgen argues:

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... ALJs have found product support investments to satisfy the domestic industry requirement in industries where such activity was far less important and by complainants whose activities were far less extensive—and the Commission adopted those findings. *See Certain Devices for Improving Uniformity Used in a Backlight Module*, Inv. No. 337-TA-805, Initial Determination at 56-61 (Oct. 22, 2012) (affirmed in relevant part) (finding the economic prong satisfied by investments in a technical support call center and service centers for LCD televisions); *Certain Video Displays*, Inv. No. 337-TA-687, Order No. 20 at 11 (May 20, 2010) (unreviewed) (finding the economic prong satisfied by investments in a call center, repair orders, warranty claims, and return authorizations for LCD and plasma televisions); *Certain Liquid Crystal Display Devices*, Inv. No. 337-TA-631, Order No. 18 at 7-9 (Sep. 23, 2008) (finding the domestic industry requirement met by Samsung's investments in support, service, repair, and replacement of cellular phones) (unreviewed). Likewise, the type of product support investments upon which Wirtgen America relies have been found to establish a domestic industry. *See Certain Automated Teller Machines*, Inv. No. 337-TA-989, Initial Determination at 318-324 (March 13, 2017) (unreviewed in relevant part) (finding domestic industry satisfied by post-importation customization, technical support, repair, and field service activities).

Id. at 91-92.

With regard to Wirtgen America's activities in comparison to Wirtgen GmbH's, Wirtgen's entire reply is:

Caterpillar suggests that Wirtgen America's investments in specific DI Products should be compared to the combined size of all Wirtgen Group companies worldwide whose business encompasses milling machines, asphalt pavers, slipform pavers, compactors, mining equipment, and rock crushers. Cat. PH Br. at 282-83. Such a comparison provides no context for the actual products at issue, and one ALJ declined to compare to a global corporate family because "[t]he Commission has recognized that even significant investments made by very large entities may appear relatively small." *Certain Semiconductor Devices*, Inv. No. 337-TA-1010, Initial Determination at 232 (June 30, 2017) (unreviewed in relevant part). The relevant comparison is to Wirtgen America itself, and between 44 and 56 percent of Wirtgen America's [] employees work in product support. CX-0008C (Mulhern Opening WS) Q368.

Id. at 92.

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Wirtgen then replies that its “investments are quantitatively significant.” Wirtgen Reply at 92. Wirtgen relies on “fulfilling 253 workshop orders, making 510 onsite visits by field service technicians, handling 3,507 technical support calls, and training 960 attendees at the training center” and fast customization. *Id.* Wirtgen also argues that 94% of its “field service and technical support employees are based in the U.S.” and that “[l]ess than 1%” of its technical support calls are escalated to Germany. *Id.* at 93. Wirtgen also argues that its “overall activity has also been trending upwards for the workshop, technical support calls, training attendance, and Wirtgen-brand warranty labor reimbursements.” *Id.* at 93-94. Wirtgen’s final argument is that Caterpillar has misapplied *Lelo*. *Id.* at 94-95.

Caterpillar replies that Wirtgen has not provided a quantitative analysis of the value added by Wirtgen America’s domestic activities, that Wirtgen’s evidence is unreliable and “was premised on assumptions without factual support,” and that Wirtgen’s investments and activities are insignificant “in the context of the market for large, expensive road milling machines[.]” Caterpillar Reply at 96-97.

The administrative law judge has determined that Wirtgen America’s labor and capital expenses, from January 1, 2014 through June 30, 2017, are significant.¹⁰⁵ In particular, the administrative law judge relies on expenses for workshop labor (\$[]), supply center labor (\$[]), field service labor and travel (\$[]), technical support labor (\$[]), training labor (\$[]), and the cold milling specialist (\$[]). *See* CX-0008C (Mulhern WS) at Q/A 266, 273, 281, 287, 295, 321, 330; CDX-0004C (Mulhern Demonstratives) at 8. The administrative law judge also relies on \$[] in warranty

¹⁰⁵ The complaint was filed on July 19, 2017. *See, e.g.*, Complaint (EDIS Doc. ID No. 617569). Accordingly, the administrative law judge finds that the time period used by Ms. Mulhern is appropriate.

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support labor, which reflects the portion of that expense that is attributable to Wirtgen America labor. *See* CX-0008C (Mulhern WS) at Q/A 302; Mulhern Tr. 173. Accordingly, the expenses total \$4.8 million (\$4,783,714) when a reasonable number is used for warranty support labor. These expenses are related to the asserted patents because they support products that are protected by the patents. Wirtgen America's employees' activities are also qualitatively significant because they provide value to the customer, reduce downtime, and form a majority of Wirtgen America's headcount ([]% of employees). *See* CX-0008C (Mulhern WS) at Q/A 345, 349, 367-68, 375. Additionally, from January 1, 2014 to June 30, 2017, Wirtgen America employed between [] and [] people in its workshop, supply center, and technical support office. *See* CX-0008C (Mulhern WS) at Q/A 262, 269, 291 (identifying [] workshop employees, [] supply center employees, and [] technical support employees); *see also* CX-0481 (which is a report from the Nashville Area Chamber of Commerce describing Wirtgen America's "dynamic role" and positive economic impact on the Nashville area).

While Caterpillar has argued that the relative value that Wirtgen America adds is small, particularly when viewed through a manufacturing perspective, the evidence shows that Wirtgen America's activities are significant because they are performed over several years and because they drive purchasing decisions. *Id.* at Q/A 376-77; *see also id.* at Q/A 349-50 (citing CX-0496C and CX-0513C); CX-0003C (McEvoy WS) at Q/A 25-26.

Thus, Wirtgen's investment in its employees (and associated travel expenses)—for the workshop, supply center, field service, technical support, warranty support, training, and cold milling specialist employees—is quantitatively and qualitatively significant. *See Lelo Inc. v. Int'l Trade Comm'n*, 786 F.3d 879, 883 (Fed. Cir. 2015) ("The plain text of § 337 requires a quantitative analysis in determining whether a [complainant] has demonstrated a 'significant

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investment in plant and equipment’ or ‘significant employment of labor or capital.’”); *see also* *Certain Devices for Improving Uniformity Used in a Backlight Module and Components Thereof and Products Containing Same*, Inv. No. 337-TA-805, Initial Determination at 56-61 (Oct. 22, 2012) (“*Backlight Modules*”) (finding the economic prong satisfied by investments related to “service, repair, and replacement of the Domestic Industry Products” and an associated call center), *aff’d in relevant part by* Comm’n Op. at 27 (May 6, 2013); *Certain Video Displays, Components Thereof, and Products Containing the Same*, Inv. No. 337-TA-687, Order No. 20 at 11 (May 20, 2010) (unreviewed) (finding the economic prong satisfied by expenses and activities associated with “Warranty, Call Center, Return, Technician, and Repair Activities”); *Certain Automated Teller Machines, ATM Modules, Components Thereof, and Products Containing the Same*, Inv. No. 337-TA-989, Initial Determination at 318-324 (Mar. 13, 2017) (finding finishing and customization, technical support, repair, software support, and field service activities constituted significant investments), *adopted in relevant part by* Comm’n Op. at 1 (July 14, 2017).

IX. Conclusions of Fact and Law

- 1) The Commission has personal jurisdiction in this investigation.
- 2) The Commission has subject matter jurisdiction in this investigation.
- 3) The Commission has *in rem* jurisdiction in this investigation.
- 4) Caterpillar Paving is an importer of Caterpillar’s PM312, PM620, PM622, PM820, PM822, and PM825 machines.
- 5) Caterpillar Prodotti is an importer of Caterpillar’s PM310, PM312, PM313, PM620, PM622, PM820, PM822, and PM825 machines.
- 6) Caterpillar Inc. is an importer of Caterpillar’s PM620, PM622, PM820, PM822, and PM825 machines.
- 7) It has not been shown that Caterpillar Americas CV is an importer of Caterpillar’s PM620 machine.

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- 8) Caterpillar's PM620 model milling machine is representative of the PM620 model, PM622 model, and PM820, PM822, and PM825 model milling machines.
- 9) Caterpillar's PM312 model milling machine is representative of the PM310, PM312, and PM313 models.
- 10) Caterpillar's 2018 Product Updates are not final designs, per Commission precedent.
- 11) With regard to the '309 and '340 Patents, the W150CFi model is representative of the W150i and W150CFi models; and the W210i model is representative of the W200i, W220, W220i, and W250i models.
- 12) With regard to the '641 Patent, the W100Ri/W120Ri models are representative of the W50Ri, W60Ri, W100Fi, W120Fi, W100CFi, W120CFi, and W130CFi models; the W150CFi model is representative of the W150i and W150CFi models; and the W210i model is representative of the W200i, W220, W220i, and W250i models.
- 13) With regard to the '530 Patent, the W120Ri model is representative of the W50Ri, W60Ri, W100Fi, W120Fi, W100CFi, W120CFi, W130CFi, W100Ri, and W120Ri models; the W150CFi model is representative of the W150i and W150CFi models; and the W210i model is representative of the W200i, W210i, W220, W220i, and W250i models.
- 14) Wirtgen has not shown that the PM620 machine infringes claim 10 of the '309 Patent.
- 15) Caterpillar's PM620 machine infringes claims 29 and 36 of the '309 Patent.
- 16) Wirtgen has not shown that its W150CFi and W210i machines practice claim 10 of the '309 Patent.
- 17) Wirtgen's W150CFi and W210i machines practice claim 29 of the '309 Patent.
- 18) Caterpillar has not shown, through clear and convincing evidence, that the asserted claims of the '309 Patent are invalid under 35 U.S.C. §§ 102 or 103.
- 19) Caterpillar has shown that claims 1 and 7 of the '641 Patent are indefinite because the "monitoring device" paragraph is claimed functionally, and thus subject to 35 U.S.C. § 112(6). The specification does not disclose adequate corresponding structure to perform all of the claimed functions, nor does the specification sufficiently disclose algorithms for all of the claimed functions.
- 20) If the "monitoring device" paragraph is functionally claimed, then Wirtgen has not shown that Caterpillar's PM620 or PM312 machines infringe claims 1 and 7 of the '641 Patent.

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- 21) If the “monitoring device” paragraph is not subject to 35 U.S.C. § 112(6), then Caterpillar’s PM620 and PM312 machines infringe claims 1 and 7 of the ‘641 Patent.
- 22) Wirtgen has shown that it is more likely than not that Caterpillar’s customers have used a PM600 series machine in a manner that directly infringes claims 11 and 17 of the ‘641 Patent.
- 23) Wirtgen has not shown that Caterpillar’s customers have used a PM300 series product in the United States. Thus, Wirtgen has not shown that Caterpillar’s customers directly infringe claims 11 and 17 of the ‘641 Patent.
- 24) Wirtgen has not shown that Caterpillar induces its customers to infringe the asserted claims of the ‘641 Patent.
- 25) If the “monitoring device” paragraph is functionally claimed, then Wirtgen has not shown that its machines practice claims 1 and 7 of the ‘641 Patent.
- 26) If the “monitoring device” paragraph is not subject to 35 U.S.C. § 112(6), then Wirtgen has shown that its machines practice claims 1 and 7 of the ‘641 Patent.
- 27) If the Wirtgen machines practice claim 1, then it is more likely than not that Wirtgen’s customers practice claims 11, 15, and 17 of the ‘641 Patent.
- 28) Caterpillar has shown, through clear and convincing evidence, that the PM-565 machine is prior art to the ‘641 Patent per 35 U.S.C. § 102(b).
- 29) The PM-565 manuals (*i.e.*, RX-0001 (PM-565 OMM) and RX-0002 (PM-565 Parts)) are not prior art to the ‘641 Patent under 35 U.S.C. § 102.
- 30) Caterpillar has shown, through clear and convincing evidence, that the PM-465 machine is prior art to the ‘641 Patent per 35 U.S.C. § 102(b).
- 31) The PM-465 manuals (*i.e.*, RX-0027 (PM-465 OMM) and RX-0028 (PM-465 Technical Presentation)) are not prior art to the ‘641 Patent under 35 U.S.C. § 102.
- 32) Caterpillar has not shown, through clear and convincing evidence, that the asserted claims of the ‘641 Patent are invalid under 35 U.S.C. §§ 102 or 103.
- 33) Caterpillar’s PM620 machine infringes claims 4, 5, 9, and 12 of the ‘340 Patent.
- 34) Wirtgen’s W150CFi and W210i machines practice claims 4, 5, 9, and 12 of the ‘340 Patent.
- 35) The MP 1300 is not prior art to the ‘340 Patent under 35 U.S.C. § 102.

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- 36) Caterpillar has shown, through clear and convincing evidence, that the PM-565 and three related manuals (*i.e.*, the PM-565 Operation & Maintenance Manual (RX-0001), the PM-565 Parts Manual (RX-0002), and the PM-565 Service Training Meeting Guide (RX-0003)) are prior art to the '340 Patent under 35 U.S.C. § 102(b).
- 37) Caterpillar has shown, through clear and convincing evidence, that claims 4, 5, 9, and 12 of the '340 Patent would have been obvious in light of the PM-565.
- 38) Caterpillar has not shown, through clear and convincing evidence, that the asserted claims of the '340 Patent would have been obvious in light of (1) the MP 1300 and/or Overton or (2) the PM-565 and Overton.
- 39) Caterpillar's PM620 machine infringes claims 2, 5, 16, and 23 of the '530 Patent.
- 40) Wirtgen's W150CFi and W210i machines practice claims 2, 5, 16, and 23 of the '530 Patent.
- 41) Caterpillar has not shown, through clear and convincing evidence, that claims 2, 5, 16, and 23 of the '530 Patent would have been obvious in light of the Roadtec RX-500, Davis, Glasson, and/or Hosseini.
- 42) Caterpillar has not shown, through clear and convincing evidence, that claims 2, 5, 16, and 23 of the '530 Patent would have been obvious in light of Swisher, Glasson, Hosseini, and/or Davis.
- 43) Caterpillar has not shown that claims 2, 5, and 16 of the '530 Patent are indefinite.
- 44) The domestic industry economic prong requirement has been satisfied under § 337(a)(3)(A), as there is a significant investment in plant and equipment with respect to the Wirtgen machines protected by the asserted patents that practice the asserted claims.
- 45) The domestic industry economic prong requirement has been satisfied under § 337(a)(3)(B), as there is a significant employment of labor or capital with respect to the Wirtgen machines protected by the asserted patents that practice the asserted claims.

X. Order Concerning Proposed Redactions for Public Version

To expedite service of the public version, the parties are hereby ordered to file with the Commission Secretary no later than October 15, 2018, a jointly marked copy of this initial determination that includes bold, red brackets to show any portion considered by the parties (or their suppliers of information) to be confidential. The parties shall simultaneously file a joint list

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indicating each page on which such a bracket is to be found and which party contends the corresponding information is confidential. At least one copy of such a filing shall be served upon the office of the undersigned, and the brackets shall be formatted in bold, red text. If a party (including any supplier of information) considers nothing in the initial determination to be confidential, and thus makes no request that any portion be redacted from the public version, then a statement to that effect shall be filed.

XI. Initial Determination on Violation

Accordingly, it is the initial determination of the undersigned that a violation of section 337 (19 U.S.C. § 1337) has occurred in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain road milling machines and components thereof.

Further, this initial determination, together with the record of the hearing in this investigation consisting of (1) the transcript of the hearing, with appropriate corrections as may hereafter be ordered, and (2) the exhibits received into evidence in this investigation, is hereby certified to the Commission.

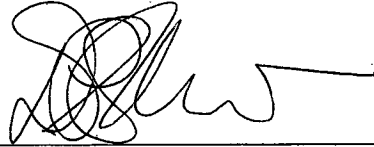
In accordance with 19 C.F.R. § 210.39(c), all material found to be confidential by the undersigned under 19 C.F.R. § 210.5 is to be given *in camera* treatment.

The Secretary shall serve a public version of this initial determination upon all parties of record and the confidential version upon counsel who are signatories to the Protective Order, as amended, issued in this investigation.

Pursuant to 19 C.F.R. § 210.42(h), this initial determination shall become the determination of the Commission unless a party files a petition for review pursuant to

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§ 210.43(a) or the Commission, pursuant to § 210.44, orders on its own motion a review of the initial determination or certain issues herein.

A handwritten signature in black ink, appearing to read 'D. Shaw', is written over a horizontal line.

David P. Shaw
Administrative Law Judge

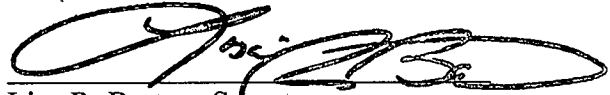
Issued: October 1, 2018

CERTAIN ROAD MILLING MACHINES AND COMPONENTS THEREOF

INV. NO. 337-TA-1067

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **INITIAL DETERMINATION** has been served on the following parties as indicated, on **OCT 31 2018**.



Lisa R. Barton, Secretary
U.S. International Trade Commission
500 E Street SW, Room 112A
Washington, DC 20436

FOR COMPLAINANT WIRTGEN AMERICA, INC.:

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() Via Hand Delivery
(☒) Express Delivery
() Via First Class Mail
() Other: _____

**RESPONDENTS CATERPILLAR PAVING PRODUCTS, INC., CATERPILLAR
PRODOTTI STRADALI S.r.L., CATERPILLAR AMERICAS CV, and
CATERPILLAR, INC.:**

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