

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SHARKNINJA OPERATING LLC,  
SHARKNINJA MANAGEMENT LLC, and  
SHARKNINJA SALES COMPANY

Petitioners,

v.

IROBOT CORPORATION,

Patent Owner

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Case IPR2020-00863  
Patent 8,418,303

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**PATENT OWNER'S  
NOTICE OF APPEAL**

Pursuant to 28 U.S.C. §§ 141(c) and 319, and 37 C.F.R § 90.2(a), notice is hereby given that Patent Owner iRobot Corporation (“iRobot”) hereby appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision entered on October 21, 2021 (Paper 33), and from all underlying orders, decisions, rulings and opinions that are adverse to iRobot. This appeal is timely under 35 U.S.C. § 142, 37 C.F.R. § 90.3, and Rule 15(a)(1) of the Federal Rules of Appellate Procedure.

In accordance with 37 C.F.R § 90.2(a)(3)(ii), the expected issues on appeal include, but are not necessarily limited to:

- (1) The Board’s decision that claims 1, 2, 4-12, 14 and 15 of U.S. Patent No. 8,418,303 were shown to be unpatentable as anticipated and/or obvious in view of the cited prior art;
- (2) the Board’s construction of the limitation “an elongated core having . . . end mounting features extending beyond respective axial ends of the outer surface of the core and defining a central longitudinal axis of rotation . . . [and] the core is rotated about the central longitudinal axis of rotation” in all claims under review and its application of that construction to the prior art, including at least the Board’s holding that the end mounting features need not rotate;

- (3) The Board’s interpretation of the limitation “the core is rotatable relative to the bearing” in claim 6 and its application of that interpretation to the prior art, including at least the Board’s implicit holding that the core can rotate “relative to the bearing” even if the bearing is part of the core, the Board’s failure to address iRobot’s argument to the contrary, and the Board’s failure to make findings regarding how alleged prior art core is “rotatable relative to the bearing” if the bearings are part of the core, as alleged by Petitioners;
- (4) the Board’s reliance on conclusory and insufficient expert testimony;
- (5) the Board’s interpretation of the prior art;
- (6) the Board’s legal errors in undertaking the aforementioned anticipation and obviousness analyses;
- (7) the Board’s findings that conflict with the evidence of record or are that are otherwise not supported by substantial evidence;
- (8) the Board’s failure to consider evidence of record fully and properly; and
- (9) all other issues decided adversely to iRobot in any orders, decisions, rulings, and opinions underlying or supporting the Final Written Decision.

Per 35 U.S.C. § 142 and 37 C.F.R. § 90.2(a)(1), this notice is being filed with the Director of the U.S. Patent and Trademark Office, and a copy is also being

filed electronically with the Patent Trial and Appeal Board. Per Federal Circuit Rule 15(a)(1) and 37 C.F.R. 90.2(a)(2), Petitioner is also submitting a copy of this Notice of Appeal, along with the required docketing fee set forth in Federal Circuit Rule 42, to the Clerk of the United States Court of Appeals for the Federal Circuit.

Respectfully submitted,

Date: 12-22-21

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**CERTIFICATE OF SERVICE**

In accordance with 37 CFR § 90.2(a)(1) and § 104.2, I hereby certify that on December 22, 2021, in addition to being filed electronically through the Board's E2E System, the original version of the foregoing, Patent Owner's Notice of Appeal was filed by hand on the Director of the United States Patent and Trademark Office, at the following address:

Director of the United States Patent and Trademark Office  
c/o Office of the General Counsel  
Madison Building East, 10B20  
600 Dulany Street  
Alexandria, VA 22314-5793

**CERTIFICATE OF SERVICE**

I hereby certify that on December 22, 2021, a true and correct copy of the foregoing, Patent Owner's Notice of Appeal, along with a copy of the Final Written Decision, was filed electronically with the Clerk's Office of the United States Court of Appeals for the Federal Circuit, at the following address:

United States Court of Appeals for the Federal Circuit  
717 Madison Place, N.W., Suite 401  
Washington, DC 20005

**CERTIFICATE OF SERVICE**

Pursuant to 37 CFR § 42.6(e)(1), the undersigned certifies that on December 22, 2021, a complete and entire copy of this Patent Owner's Notice of Appeal was provided via email, to the Petitioner by serving the email correspondence addresses of record as follows:

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SHARKNINJA OPERATING LLC,  
SHARKNINJA MANAGEMENT LLC, AND  
SHARKNINJA SALES COMPANY,  
Petitioner,

v.

IROBOT CORPORATION,  
Patent Owner.

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IPR2020-00863  
Patent 8,418,303 B2

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Before BARRY L. GROSSMAN, TERRENCE W. McMILLIN, and  
AMANDA F. WIEKER, *Administrative Patent Judges*.

McMILLIN, *Administrative Patent Judge*.

JUDGMENT  
Final Written Decision  
Determining All Challenged Claims Unpatentable  
*35 U.S.C. § 318(a)*

## I. INTRODUCTION

### A. *Background and Summary*

SharkNinja Operating LLC, SharkNinja Management LLC, and SharkNinja Sales Company (collectively “Petitioner”) filed a Petition requesting an *inter partes* review of claims 1, 2, 4–12, 14, and 15 of U.S. Patent No. 8,418,303 B2 (Ex. 1001, “the ’303 patent”). Paper 1 (“Pet.”). iRobot Corporation (“Patent Owner”) filed a Response. Paper 19 (“PO Resp.”). Petitioner filed a Reply. Paper 22 (“Reply”). Patent Owner filed a Sur-reply. Paper 24 (“Sur-reply”). Oral argument was heard on August 4, 2021, and a transcript was entered into the record. Paper 32 (“Tr.”).

We have jurisdiction to conduct this *inter partes* review under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed herein, we determine that Petitioner has shown, by a preponderance of the evidence, that claims 1, 2, 4–12, 14, and 15 of the ’303 patent are unpatentable.

### B. *Related Matters*

The parties identify the following matters related to the ’303 patent:

*SharkNinja Operating LLC v. iRobot Corp.*, Case No. 1:19-cv-01935 (D. Del.) (filed Oct. 11, 2019);

*iRobot Corp. v. SharkNinja Operating LLC*, Case No. 1:19-cv-12135 (D. Mass.) (filed Oct. 15, 2019); and

*SharkNinja Operating LLC v. iRobot Corp.*, Case No. 1:19-cv-12236 (D. Mass.) (filed Oct. 30, 2019).

Pet. 88; Paper 4, 2.

C. The '303 Patent

The '303 patent is titled “Cleaning Robot Roller Processing.” Ex. 1001, code (54). The disclosed invention “relates to coverage robots, cleaning rollers, and roller cleaning systems.” *Id.* at 1:17–18. The disclosed device includes a cleaning assembly having at least one driven roller/flapper brush with an elongated core, mounting features extending beyond axial ends of the core, and a compliant flap extending radially outward from the core. *Id.* at 1:35–45. The flap is configured to prevent filaments from spooling tightly about the core, and axial end guards adjacent the ends of the core prevent spooled filaments from traversing axially from an outer surface of the core onto the mounting features. *Id.* at 1:46–52. In particular, roller 100 is depicted in Figure 3, reproduced below.

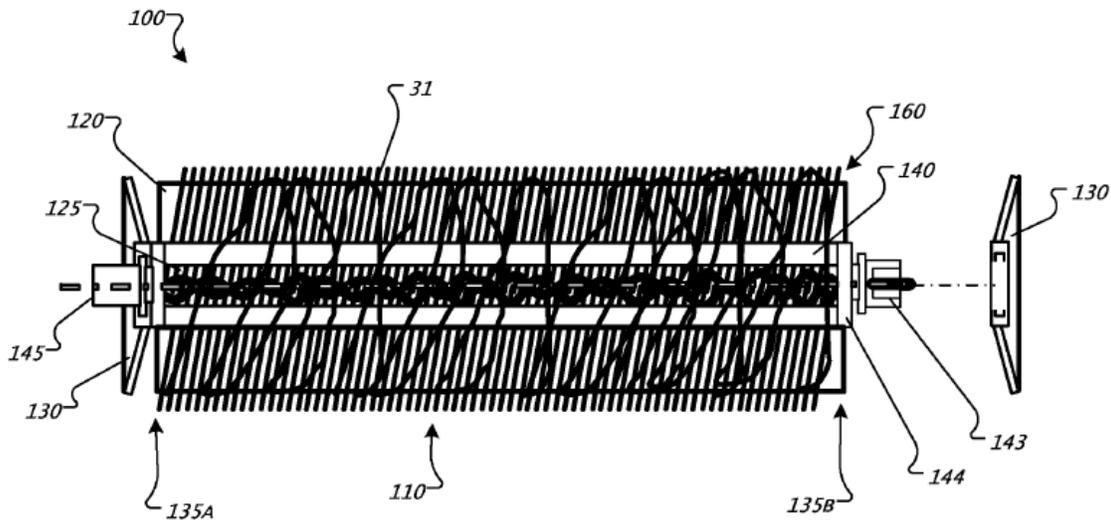


FIG. 3

Figure 3 is a side view of a cleaning roller for a coverage robot or cleaning device. *Id.* at 1:62–63. “[R]oller 100 includes an end cap 144, which is a

substantially circular plate at either or both ends of the roller 100 supporting integral ribs 125 and/or a brush core 140.” *Id.* at 5:6–9. Roller 100 also includes “[r]emovable conical end guards 130 made of a soft elastomer [that] limit the longitudinal travel of filaments 33,<sup>[1]</sup> keep filaments 33 and collected hair 33 within the brush ends 135A-B, and/or prevent hair 33 from spilling over onto bearings 143.” *Id.* at 5:16–20. “Elastomeric (*e.g.* soft) flaps 120 are supported by the core 140 of the roller 100 and extend longitudinally. These elastomeric or inner pliable flaps 120 are arranged between the bristles 110.” *Id.* at 5:22–25. Roller 100 is part of cleaning head assembly 40 that is installed in chassis 31 of a robotic floor cleaner. *See id.* at 4:50–54, Fig. 1B.

#### *D. Challenged Claims*

Petitioner challenges claims 1, 2, 4–12, 14, and 15 of the ’303 patent. The ’303 patent includes two independent claims: 1 and 10 (both directed to a floor cleaner). Claim 1 recites:

1. A floor cleaner comprising:
  - a chassis; and
  - a cleaning assembly carried by the chassis and comprising:
    - a cleaning assembly housing; and
    - at least one driven brush rotatably coupled to the cleaning assembly housing and comprising:
      - an elongated core having an outer surface and end mounting features extending beyond respective axial ends of the outer surface of the core and defining a central longitudinal axis of rotation;
      - a compliant portion extending radially outward from the core to sweep a floor surface as the core is rotated about the central

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<sup>1</sup> Apparently, mislabeled as 31 in Figure 3. Reference number 31 is also used in Figure 1B to designate the chassis. *See, e.g.*, Ex. 1001, 1:45–46.

longitudinal axis of rotation; and  
an axial end guard mountable about one of the end mounting features, the axial end guard configured to prevent spooled filaments from traversing axially beyond the extremity of the mounting feature about which the axial end guard is mounted, wherein the end guard is removable from a longitudinal end of the core.

Ex. 1001, 17:27–45.

*E. Prior Art and Asserted Grounds*

<b>Claim(s) Challenged</b>	<b>35 U.S.C. §<sup>2</sup></b>	<b>Reference(s)</b>
1, 4–7, 9–11, 14, 15	102(b)	Lang <sup>3</sup>
1, 4–7, 9–11, 14, 15	103(a)	Lang, Fahlen <sup>4</sup>
8	103(a)	Lang, Krier <sup>5</sup>
8	103(a)	Lang, Fahlen, Krier
1, 2, 4–12, 14, 15	103(a)	Brundula, <sup>6</sup> Lang
1, 2, 4–12, 14, 15	103(a)	Brundula, Fahlen, Lang

Pet. 2–3. Petitioner relies on the Declaration of Mr. Joseph A. Fester (Ex. 1003). Patent Owner relies on the Declaration of Donald A. Coates, Ph.D. (Ex. 2016).<sup>7</sup>

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<sup>2</sup> Because the application leading to the '303 patent was filed before March 16, 2013, patentability is governed by the versions of 35 U.S.C. §§ 102 and 103 preceding the Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, 125 Stat. 284 (2011).

<sup>3</sup> U.S. Patent 1,680,741, issued Aug. 14, 1928 (Ex. 1005).

<sup>4</sup> U.S. Patent 4,238,870, issued Dec. 16, 1980 (Ex. 1008).

<sup>5</sup> U.S. Patent 3,588,945, issued June 29, 1971 (Ex. 1012).

<sup>6</sup> U.S. Patent 5,452,490, issued Sept. 26, 1995 (Ex. 1013).

<sup>7</sup> Patent Owner’s Updated Exhibit List (Paper 30) filed on July 30, 2021,

## II. ANALYSIS

### *A. Summary of the Arguments and Dispute*

The dispute between the parties is primarily related to the phrase “an elongated core having . . . end mounting features” as recited in the context of independent claims 1 and 10. *See* Ex. 1001, 17:33–36 (claim 1), 18:23–26 (claim 10). Petitioner relies on teachings from the prior art showing bearings as “end mounting features.” Patent Owner contends that these prior art teachings do not meet the claim language because the entirety of the “elongated core” including the “end mounting features” must rotate and portions of the bearings disclosed in the cited prior art do not rotate. At oral argument both parties acknowledged that their dispute is primarily one of claim construction. Tr. 7:24–25 (Petitioner’s counsel: “Claim construction is dispositive in this case.”), 30:1–3 (Patent Owner’s counsel agreeing that Petitioner’s counsel “had that exactly right.”). Thus, claim construction is dispositive as to challenged claims 1, 4, 5, 7, 9–12, 14, and 15.

Patent Owner also raises issues relating to the limitations found in dependent claims 2 and 6, and motivation to combine the relevant teachings of Brundula and Lang. *See, e.g.*, PO Resp. 6–7.

### *B. Claim Construction*

Claim construction in this proceeding is governed by 37 C.F.R.

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does not list the Coates Declaration (Exhibit 2016) as an exhibit. We consider this to be an inadvertent error and have considered the Coates Declaration (Ex. 2016) in preparing this Decision. The Coates Declaration (Ex. 2016) was listed as an exhibit in Patent Owner’s Response (PO Resp. 4) and Sur-Reply (Sur-reply iv) and was referred to and relied upon in both of those papers. We can find no record of the Coates Declaration (Ex. 2016) being withdrawn and it was not stricken.

§ 42.100 (b), which provides:

In an *inter partes* review proceeding, a claim of a patent, or a claim proposed in a motion to amend under §42.121, shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.

Under the standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–19 (Fed. Cir. 2005) (en banc), claim terms are given their ordinary and customary meaning, as would have been understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history of record. *See Thorner v. Sony Comput. Ent. Am. LLC*, 669 F.3d 1362, 1365–66 (Fed. Cir. 2012). There is a “heavy presumption,” however, that a claim term carries its ordinary and customary meaning. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (citation omitted).

We are also guided by the principle that we only construe claim terms if, and to the extent that, it is necessary for the purpose of the proceeding. *See, e.g., Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“[C]laim terms need only be construed ‘to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

The parties agree that the claim terms should be interpreted according to their plain meaning consistent with the Specification. PO Resp. 11 (“The[ ] claim limitations should . . . be given their ordinary and customary, *i.e.*, plain, meaning.”); Reply 11 (“The parties agree that the plain meaning

of the claim language controls.”); Sur-reply 1 (“Correctly framed, resolution of the claim construction dispute turns on plain meaning of the claim language in light of the specification.”). In light of this, we construe the disputed claim terms by identifying the plain meaning consistent with the Specification.

Patent Owner’s primary argument is a claim construction issue relating to the following language recited in independent claims 1 and 10 (*see* PO Resp. 10–17 (headed “Claim Construction”)):

an elongated core having an outer surface and end mounting features extending beyond respective axial ends of the outer surface of the core and defining a central longitudinal axis of rotation . . . [and]

the core is rotated about the central longitudinal axis of rotation

Ex. 1001, 17:33–36, 38–39 (claim 1), 18:23–26, 29–30 (claim 10). Patent Owner labels these limitations “the ‘core’ limitations” and argues:

Based on plain meaning, these two limitations—the “core” limitations—collectively include three distinct requirements of the “core:” (i) that it “ha[s]” both “an outer surface” and “end mounting features,” (ii) that it “defin[es] a central longitudinal axis of rotation,” and (iii) that it is “rotated about the central longitudinal axis of rotation.”

PO Resp. 10 (alterations in original). According to Patent Owner, “because the ‘outer surface’ and ‘end mounting features’ are each parts of the ‘core’ (*i.e.*, ‘core **having** an outer surface and end mounting features’), the two

claim limitations require that both the ‘outer surface’ and the ‘end mounting features,’ as parts of the ‘core,’ also rotate with it.” *Id.* at 11.<sup>8</sup>

We agree with Patent Owner that the plain meaning of the claim language requires that the “core” rotate but we discern nothing in the plain meaning of the claim language that requires that all constituent parts of the “end mounting features” must rotate. Stated differently, we determine that the “core” limitations can be met even if some of the parts of the “end mounting features” do not rotate.

Patent Owner contends that use of the word “having” in the phrase “an elongated core having . . . end mounting features” dictates that independent claims 1 and 10 should be construed such that the “end mounting features” must rotate with the core in order to meet the further limitation that “the core is rotated about the central axis of rotation.” *See* PO Resp. 11 (“[B]ecause the ‘outer surface’ and ‘end mounting features’ are each parts of the ‘core’ (*i.e.*, ‘core **having** an outer surface and end mounting features’), the two claim limitations require that both the ‘outer surface’ and the ‘end mounting features,’ as parts of the ‘core’ also rotate with it.”), 15, 20 (“Under plain meaning, these two limitations require that the ‘end mounting features,’ as parts of the ‘core’ that is ‘rotated,’ also rotate.”), 24 (“Petitioner’s mappings to Lang and Brundula for the ‘end mounting features’ are each deficient because they include one or more components that would not be understood to rotate as part of what Petitioner identifies as representing the ‘core.’”).

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<sup>8</sup> Patent Owner does not argue that the cited art fails to disclose “an elongated core having an outer surface” as recited in the claims. *See generally* PO Resp.

In response to this argument, Petitioner argues that “the plain meaning of ‘having’ does not require physical integration or co-rotation.” Reply 11.

In support of this argument, Petitioner contends:

[A] larger object can “have” a component even if the component is not integral to and does not rotate with the larger objects. For example, a car “having” wheels that rotate to move the car does not mean that the car and wheels must rotate together. Likewise, a carousel “having” a base that is attached to the ground will rotate during operation, but the base will not rotate with it. This is because “have” is a broad word that means “possess,” “be made up of” or “comprise,” Ex-1032 [Concise Oxford English Dictionary]; or “to hold, include, or contain as a part or whole,” Ex-1033 [Merriam-Webster’s Collegiate Dictionary]. It does not require physical integration, nor does it require every component of the larger object to rotate with the rest of the larger object.

*Id.* at 11–12. We agree with Petitioner that neither the word “having” considered alone nor with the phrases “an elongated core having . . . end mounting features” and “the core is rotated about the central axis of rotation” as recited in the context of claims 1 and 10 require that the “end mounting features” rotate.

Patent Owner also relies on the Specification of the ’303 patent to support its claim construction argument. Specifically, Patent Owner cites to Figure 5 and its related description in the Specification (Ex. 1001, 6:20–52). PO Resp. 11–13 (citing Ex. 1001, 6:20–52, Fig. 5). Figure 5 is reproduced below.



angles or protrusions 146 on the axle 145, preventing the end guard 130 from rotating.

FIG. 5 shows the end of the roller 100 (turned so the ribs 125 are orthogonal to a viewer) with the end guard 130 about to be mounted. The end guard 130 is slid onto the axle 145 of the roller 100 until the tabs 130 abut the end cap 144, or until the protrusions 146 on the axle 145 and/or end cap 144 abut the flat torus of the end guard 130. The bearing 143 is a plastic-housed metal bushing that is mounted on a metal axle pin within the axle 145 of the roller 140, and the bushing 143 is mounted to a compatible holder on the robot 10, such that the roller 100 rotates on the metal axle pin about the bushing 143. For example, the axle 145 and the end guard 130 can be mounted in a robot 10 to rotate about the bearing 143, which mates with the mount in the robot 10. Triangular shaped features 147 on the roller 100 act as ramps, allowing the end guards 130 to be easily twisted off the roller 100 for servicing.

*Id.* at 6:20–52. With regard to the embodiment depicted in Figure 5 and described in this passage from the Specification, Patent Owner states, “the brush roller core [140], defines an axis 101 representing the recited ‘longitudinal axis of rotation’” and “[t]he brush roller core [140] also includes axle 145 and protrusions 146, which represent exemplary ‘end mounting features’” and contends a person of ordinary skill in the art “would have further understood that since axle 145 and protrusions 146 are part of the brush roller core [140], these components rotate about axis 101 with the brush roller core [140].” PO Resp. 12.

Patent Owner further states, “[t]he ‘303 patent further describes that ‘the bushing 143 is mounted to a compatible holder on the robot 10, such that the roller 100 rotates on the metal axle pin about the bushing 143.’ [Ex. 1001], 6:45-48” and contends, “a POSITA [person of ordinary skill in the art] would have understood that the brush roller core [140], which, being

part of the roller 100, would also all rotate about axis 101. Ex-2016, ¶39. Specifically, these elements would rotate ‘about the bushing 143,’ *i.e.*, about axis 101 with bushing 143 being stationary.” PO Resp. 12.

However, we determine that the Specification of the ’303 patent does not support Patent Owner’s further contention that “[b]ecause bushing 143 does not rotate, it does not represent one of the ‘end mounting features.’” *Id.*<sup>10</sup> Although we can find no explicit statement in the ’303 patent as to whether the “end mounting features” rotate in whole or in part, we determine that the Specification contradicts Patent Owner’s argument, including the passage Patent Owner cites. The cited passage includes these two sentences:

The bearing 143 is a plastic-housed metal bushing that is mounted on a metal axle pin within the axle 145 of the roller 140, and the bushing 143 is mounted to a compatible holder on the robot 10, such that the roller 100 rotates on the metal axle pin about the bushing 143. For example, the axle 145 and the end guard 130 can be mounted in a robot 10 to rotate about the bearing 143, which mates with the mount in the robot 10.

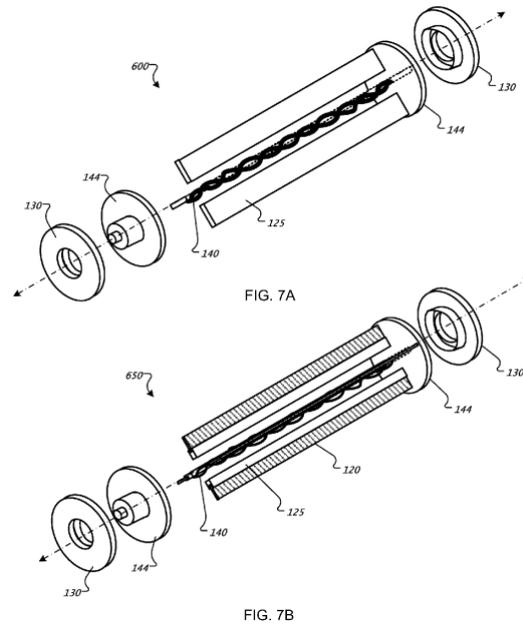
Ex. 1001, 6:43–50. These sentences state that bearing/bushing 143 is mounted on a pin within the brush roller core 140 such that the core rotates and the bearing/bushing 143 is also mounted to the robot 10 such that the

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<sup>10</sup> The only support Patent Owner cites is paragraph 39 of the Declaration of Donald A. Coates, Ph.D. (Ex. 2016). Paragraph 39 is a verbatim copy of the first paragraph on page 12 of the Patent Owner’s Response. *Compare* Ex. 2016 ¶ 39, *with* PO Resp. 12 (first paragraph). However, neither Dr. Coates in his Declaration nor Patent Owner in its Response provides any reasoning or explanation to support the conclusion that “[b]ecause bushing 143 does not rotate, it does not represent one of the ‘end mounting features.’” We find Dr. Coates’s testimony conclusory and do not find it persuasive to support the stated conclusion. And, thus, we reject this conclusion based on Dr. Coates’s testimony in the Response.

bearing/bushing 143 would be prevented from rotating. Thus, the bearing/bushing is explicitly described as one of the “end mounting features” and the bearing/bushing does not rotate. Thus, there is no basis for concluding “[b]ecause bushing 143 does not rotate, it does not represent one of the ‘end mounting features.’”

Although not cited by Patent Owner, we also look to other figures and their related descriptions in order to interpret the claims. With regard to the brush roller core 140, we refer to Figures 7A and 7B, reproduced below, that show the brush roller core 140 more clearly.



Figures 7A and 7B depict “exploded views of cleaning rollers.” Ex. 1001, 3:66–67. “In FIGS. 7A and 7B, for the purposes of illustration, only the brush core 140, and not bristles 110 or beaters 111 are shown.” *Id.* at 7:2–4. In Figures 7A and 7B, brush roller core 140 is depicted as a long, thin, center piece of the roller. This is consistent with the plain meaning of “core.” In Figures 7A and 7B, the “core” is not depicted as including any “end mounting features.”





*include a bushing.*” *Id.* (citing Ex. 1030, 215). We rely on the intrinsic evidence in construing the claims, but note that Patent Owner has taken actions in other proceedings that are inconsistent with the claim construction argued here.

Patent Owner’s argument that the “core” limitations of the independent claims only cover “end mounting features” that rotate with the core fails. Given its plain meaning, nothing in claim language or Specification indicates whether the “end mounting features” rotate or do not rotate. The plain meaning of the claim language is broad enough to include “end mounting features” that rotate or that do not rotate. And, we decline to read into the plain meaning of the claim language any unstated characteristics not dictated by the plain meaning.

### *C. Legal Standards*

In order for a prior art reference to serve as an anticipatory reference, it must disclose every limitation of the claimed invention, either explicitly or inherently. *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997). Anticipation “requires that every element and limitation of the claim was previously described in a single prior art reference, either expressly or inherently, so as to place a person of ordinary skill in possession of the invention.” *Sanofi-Synthelabo v. Apotex, Inc.*, 550 F.3d 1075, 1082 (Fed. Cir. 2008) (citing *Schering Corp. v. Geneva Pharms., Inc.*, 339 F.3d 1373, 1379 (Fed. Cir. 2003); *Cont’l Can Co. USA v. Monsanto Co.*, 948 F.2d 1264, 1267–69 (Fed. Cir. 1991)). “[U]nless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim, it cannot be said to prove prior invention of the thing claimed and,

thus, cannot anticipate under 35 U.S.C. § 102.” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter 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. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). Consideration of the *Graham* factors “helps inform the ultimate obviousness determination.” *Apple Inc. v. Samsung Elecs. Co., Ltd.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016) (en banc).

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

We analyze the challenges presented in the Petition in accordance with the above-stated principles.

*D. Level of Ordinary Skill in the Art*

Petitioner identifies the appropriate level of skill in the art as “someone with at least a four-year degree in mechanical engineering, or closely related field, and at least one year of experience in the design and implementation of vacuum cleaning systems.” Pet. 8 (citing Ex. 1003 (Fester Decl.) ¶ 30). Patent Owner does not provide an assessment of the appropriate skill level. *See generally* PO Resp. For purposes of this Decision, we adopt Petitioner’s assessment, which is undisputed and appears consistent with the level of skill reflected in the Specification and prior art.

*E. Claims 1, 4–7, 9–11, 14, 15: Consideration of Alleged Anticipation by Lang and Obviousness in View of Lang and Fahlen*

We begin our analysis with a consideration of Petitioner’s allegations that Lang anticipates claims 1, 4–7, 9–11, 14, and 15 and that the combination of Lang and Fahlen would have rendered claims 1, 4–7, 9–11, 14, and 15 obvious. *See* Pet. 3, 17–53. We start with a description of the disclosures of Lang and Fahlen and then consider the arguments and evidence presented relating to the limitations of the challenged claims.

*1. Lang (Ex. 1005)*

Lang issued on August 14, 1928 (Ex. 1005, 2<sup>12</sup>) and is prior art to the ’303 patent under 35 U.S.C. § 102(b), because it was patented more than one year prior to the earliest priority date of May 19, 2006, claimed for the ’303 patent (Ex. 1001, codes (22), (60), (63), 1:3–13). Lang was not a reference cited during examination of the application for the ’303 patent. *Id.* at

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<sup>12</sup> Lang has two sets of page numbers. We refer to the page numbers in the lower, left corner, because, in this set, all pages are numbered.

code (56); *see also* Pet. 87 (“No reference relied upon in this Petition was considered by the U.S. Patent and Trademark Office (‘Office’) during prosecution.”).

Lang is titled, “Bearing Structure for Vacuum Cleaner Brushes and the Like.” Ex. 1005, 2. Figure 1 of Lang is reproduced below.

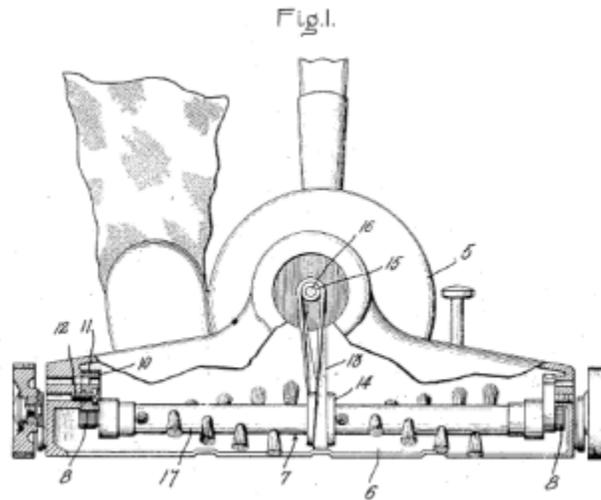


Figure 1 of Lang depicts “a vacuum cleaner having a brush.” *Id.* at 2:70–71. Lang is directed to “an improved bearing structure for a vacuum cleaner brush which permits the safe and continuous use of ball and similar accurate bearings . . . and which may be easily assembled and disassembled without injury to any of the parts thereof.” *Id.* at 2:47–54. Lang’s vacuum cleaner 5 includes nozzle 6 in which a brush and bearing unit is mounted. *Id.* at 2:85–87, Fig. 1. A bearing structure is depicted in Lang’s Figure 2, reproduced below.





### 3. Discussion

It is undisputed that the cited art teaches or suggests all the limitations of claims 1, 4, 5, 7, 9–11, 14, and 15 except the “core” limitations. *See, supra*, § II.B. (“Claim Construction”). With regard to claims 1, 4–7, 9–11, 14, and 15, Patent Owner contests whether the cited art meets the “core” limitations as construed to require that the “end mounting features” rotate in their entirety. Patent Owner also disputes whether the cited art discloses the limitations recited in dependent claim 6.

#### Claim 1

*A floor cleaner comprising:*

Petitioner does not take a position as to whether the preamble of claim 1 is limiting. Pet. 17 (“If the Board finds the preamble limiting, *Lang* discloses this element in vacuum cleaner 5.”) (citing Ex. 1005, 1:69–72, 1:85–87, Fig. 1; Ex. 1003 (Fester Decl.) ¶¶ 53–54).

We determine that the preamble of claim 1 is not limiting because a structurally complete invention is recited in the body of claim 1 and the preamble only states the purpose or intended use of the invention. *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997) (“[W]here a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention, the preamble is not a claim limitation.”). However, we also agree with Petitioner that *Lang* discloses a floor cleaner, i.e., a vacuum cleaner.

*a chassis; and*

Petitioner asserts, “*Lang* discloses [a chassis] in at least the base of nozzle 6 and its wheels.” Pet. 18 (citing Ex. 1003 (Fester Decl.) ¶¶ 55–59).

The Petition states, “The skilled artisan would have understood the base of *Lang*’s nozzle and its wheels . . . , along with other support along the base of the vacuum cleaner, discloses a ‘chassis’ upon which the components, including the nozzle body and brush assembly, are mounted” (*id.* at 19 (citing Ex. 1003 ¶ 55)) and:

Dictionary definitions support this broad understanding of a chassis as “the supporting frame of a structure” or “the frame and working parts . . . exclusive of the body or housing.” Ex. 1014 [definition of “chassis,” *Merriam Webster’s Collegiate Dictionary* (10<sup>th</sup> ed. 2001)]. *Lang*’s nozzle base and wheels likewise provide a supporting frame that supports its cleaning assembly, i.e., *Lang*’s nozzle body and brush.

*Id.* at 20.

Petitioner also contends that “[i]f [Patent Owner] argues *Lang* does not expressly disclose a ‘chassis,’ this limitation is inherent in *Lang*.” Pet. 20 (citing Ex. 1003 (Fester Decl.) ¶ 57). In support of this contention, the Petitioner argues:

*Lang*’s vacuum cleaner would need a chassis to support its brush and nozzle so it could clean the floor. Without a chassis to support them, the brush and nozzle would fall to the floor. And without a chassis with mounted wheels, it would not be possible to push and steer *Lang*’s vacuum cleaner. All vacuum cleaners include a chassis for these reasons.

*Id.* at 20–21 (citations omitted).

Petitioner’s showing with regard to this limitation is undisputed, supported, and persuasive. *See* Pet. 18–22. We find *Lang* discloses a “chassis” as recited in claim 1.

*a cleaning assembly carried by the chassis and comprising:*

Petitioner asserts, “*Lang* discloses [a cleaning assembly] in the brush

and nozzle body.” Pet. 22 (citing Ex. 1003 (Fester Decl.) ¶¶ 60–61). The Petition states,

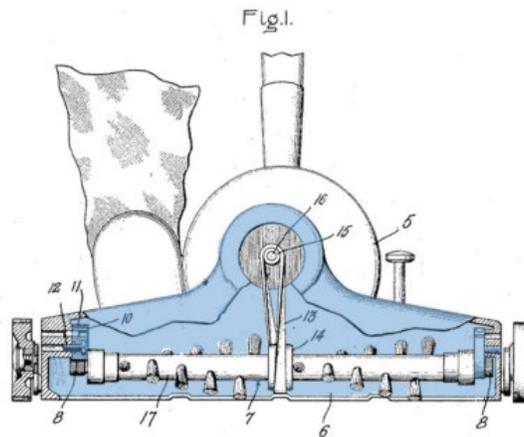
*Lang*’s bearing structures are “mounted as units with the brush in the nozzle of the vacuum cleaner,” and its brush is “driven from the motor.” *Lang*, [2]:1–7. The brush loosens dirt on the surface, which is removed by suction. *Id.*, [2]:7–11. The brush and nozzle body are the claimed cleaning assembly, because they agitate debris and suction it from the floor. [Ex. 1003] ¶ 60.

*Id.* at 22–23.

Petitioner’s showing with regard to this limitation is undisputed, supported, and persuasive. *See* Pet. 22–24. We find *Lang* discloses a “cleaning assembly carried by the chassis” as recited in claim 1.

*a cleaning assembly housing; and*

Petitioner asserts, “*Lang* discloses [a cleaning assembly housing] in the body of nozzle 6, including its ‘brush supporting means.’” Pet. 24 (citing Ex. 1003 (Fester Decl.) ¶ 62). In support, the Petition includes an annotated version of Figure 1 of *Lang*, reproduced below.



*Id.* Annotated Figure 1 depicts the “brush supporting means” of *Lang* in blue.

Petitioner’s showing with regard to this limitation is undisputed, supported, and persuasive. *See* Pet. 24–25. We find Lang discloses a “cleaning assembly housing” as recited in claim 1.

*at least one driven brush rotatably coupled to the cleaning assembly housing and comprising:*

Petitioner relies on the brush and bearing unit 7 (Ex. 1005, 2:87), the brush cylinder 17 (*id.* at 2:101), and the “belt 13 which runs on a pulley 14 on the brush” (*id.* at 2:93–94) shown in Figure 1 of Lang for disclosing “one driven brush rotatably coupled to the cleaning assembly.” Pet. 25–26. The Petition provides, “*Lang* states the ‘**brush is driven** by a belt 13 which runs on a pulley’ that is driven by a motor” (*id.* at 26 (citing Ex. 1005, 2:92–97)) and “*Lang*’s ‘brush and bearing unit’ is ‘mounted’ in the nozzle, and ‘supported at its ends by knurled or roughened end nuts 8 which are held in slots 9 in disks 10 by means of spring fingers 11 . . . suitably fixed to the end walls of the nozzle 6 by screws 12’” (*id.* (citing Ex. 1005, 2:88–92, 3:54–64, Fig. 3)). Petitioner contends, “This allows the brush to rotate and clean the floor.” *Id.* at 27; *see also* Ex. 1003 (Fester Decl.) ¶ 65.

Petitioner’s showing with regard to this limitation is undisputed, supported, and persuasive. *See* Pet. 25–27. We find Lang discloses a “driven brush rotatably coupled to the cleaning assembly housing” as recited in claim 1.

*an elongated core having an outer surface and end mounting features extending beyond respective axial ends of the outer surface of the core and defining a central longitudinal axis of rotation;*

Petitioner asserts that “*Lang*’s driven brush includes an ‘elongated core having an outer surface’ because *Lang*’s brush cylinder 17 is a ‘metal tube provided with a wooden dowel or core 18 over which, at each end, the

tube edges are rolled . . . to firmly secure the dowel” (Pet. 27 (alteration in original) (citing Ex. 1005, 1:100–2:3; Ex. 1003 (Fester Decl.) ¶¶ 66–71) and “*Lang* discloses the claimed ‘end mounting features’ in its bearing structure, which allows the brush to be rotatably mounted in the nozzle” (*id.*).

Petitioner further asserts that “*Lang*’s bearing structures . . . extend *beyond* the axial ends of the brush core and cylinder” (*id.* at 29 (citing Ex. 1005, 2:100–3:7); Ex. 1003 (Fester Decl.) ¶ 67) and “*Lang*’s core 18, cylinder 17, and bearing structure ‘defin[e] a central longitudinal axis of rotation’” (*id.* at 30 (citing Ex. 1003 (Fester Decl.) ¶ 71) (alteration in original)).

As noted above, Patent Owner disputes whether the cited art discloses the “core” limitations on the basis that claim 1, as properly construed, requires that all parts of the “end mounting features” must rotate. *See, e.g.*, PO Resp. 24 (“Petitioner’s mappings to *Lang* and *Brundula* for the ‘end mounting features’ are each deficient because they include one or more components that would not be understood to rotate as part of what Petitioner identifies as representing the ‘core.’”). Specifically, Patent Owner argues:

After identifying *Lang*’s brush cylinder 17 as corresponding to the recited “core,” the Petition asserts that “[~~t~~]**ogether**, bearing housing 20, bearing proper 28, stud 35, **and** knurled supporting nut 8 disclose the ‘end mounting features’ (emphasis added). Pet., 27-29. *Lang*, however, discloses that stud 35 and knurled supporting nut 8 are stationary relative to the rotating cylinder 17. *Lang*, 3:54-61 (“[i]n operation, **supporting nut 8, stud 35**, the thread guard 41 and the inner race 30 of the bearing **are held stationary**[.]”) (emphasis added). Similarly, bearing proper 28 is also stationary relative to the rotating cylinder 17 since, as a “simple ball bearing,” it includes a stationary inner race 30. *Lang*, 2:59-65 (“**The inner race 30 is stationary in operation...**”) (emphasis added). *Lang*’s bearing proper 28, stud 35, and knurled supporting nut 8 therefore cannot be mapped to “end

mounting features” since they are stationary and thus do not “rotate[] about [a] central longitudinal axis of rotation.” Ex-2016, ¶¶51-52.

PO Resp. 21 (alterations in original). As can be readily appreciated, this argument by Patent Owner rests on its claim construction argument that we have rejected. *See, supra*, § II.B. (“Claim Construction”). Accordingly, we also reject this argument as not supported by properly construed claim 1.

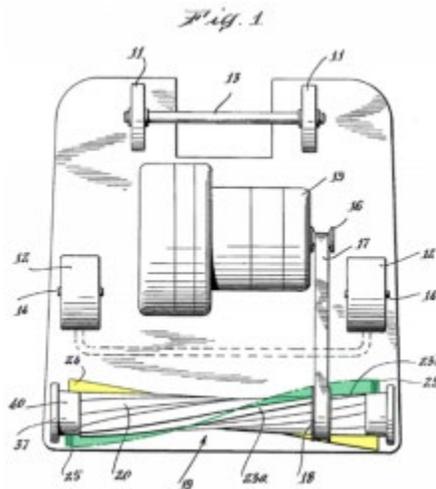
Petitioner’s showing with regard to this limitation is supported and persuasive. *See* Pet. 27–30. We find Lang discloses “an elongated core having an outer surface and end mounting features extending beyond respective axial ends of the outer surface of the core and defining a central longitudinal axis of rotation” as recited in claim 1.

*a compliant portion extending radially outward from the core to sweep a floor surface as the core is rotated about the central longitudinal axis of rotation; and*

Petitioner asserts Lang discloses “a compliant portion” as recited and Lang and Fahlen would have rendered this limitation obvious. Pet. 31–33. With regard to Lang disclosing the recited “compliant portion,” Petitioner relies on the brush bristles shown extending radially outward from the core as shown in Figure 1 (reproduced above) and Figure 3 of Lang. *Id.* at 31. Petitioner also relies on Lang’s disclosure that, “[t]he brush operates directly on the surface being cleaned and serves to loosen the dirt, grit and other clinging material, such as threads and the like, so that the suction may remove them” (Ex. 1005, 2:7–11) and that the brush rotates about the “axis of the stud 35” (shown in Figures 2 and 4) (*id.* at 4:54–64). Petitioner contends, “[a] skilled artisan would have understood *Lang*’s disclosure to mean the bristles ‘sweep a floor surface as the core is rotated about the

central longitudinal axis of rotation” as recited in this limitation. Pet. 32 (citing Ex. 1003 (Fester Decl.) ¶ 73).

Alternatively, Petitioner contends, “[i]f [Patent Owner] argues that the ‘compl[ia]nt portion’ also requires a ‘compliant flap’ or ‘beater,’ e.g., ’303 patent, Abstract, 7:4-6, 11:1-21, *Lang* and *Fahlen* render[] this element obvious.” Pet. 32. The Petition includes an annotated Figure 1 from *Fahlen*, reproduced below.



*Id.* Annotated Figure 1 of “*Fahlen* discloses a helically twisted ‘brush-beater roller’ with bristles 25 (green) and beater bars 24 (yellow).” *Id.* And, Petitioner asserts that “*Fahlen*’s beating bar is compliant.” *Id.* (citing Ex. 1003 (Fester Decl.) ¶ 74).

With regard to the reason to combine the relevant teachings of *Lang* and *Fahlen* relating to the “compliant portion” recited in this limitation of claim 1, the Petition states:

It was well known to use flaps or beater bars with brush bristles on a brushroll before the ’303 patent. [Ex. 1003] ¶ 75. The skilled artisan knew that combining bristles and an agitating element, a beater bar or flap, improved the loosening of dirt from carpet. *Id.* For example, in addition to *Fahlen*’s

teaching to combine bristles and beater bars, other prior art patents taught the same combination, touting its advantages. *Id.* (citing *Lyman*,<sup>[13]</sup> Abstract, 1:10-45, 2:38-42, Fig. 2; *Mertes*,<sup>[14]</sup> 1:14-21; *Butler*,<sup>[15]</sup> ¶ 35). Thus, one skilled in the art would have found it obvious to incorporate *Fahlen*'s beater elements into *Lang*'s brushroll because doing so would have been the combination of a known element (*Fahlen*'s combination of bristles and beater bars) with a known system (*Lang*'s) to achieve the desirable and predictable result of a vacuum cleaner that more effectively removes dirt from carpet. *Id.*

Pet. 32–33.

As discussed previously, Patent Owner argues solely that the “core” of *Lang* is not rotated because the “end mounting features” are an integral part of the “core” and all the “end mounting features” from *Lang* do not rotate. PO Resp. 21. However, this argument is based on Patent Owner's claim construction contentions which we have rejected and is not effective.

Petitioner's showing with regard to this limitation is supported and persuasive. *See* Pet. 31–33. We find *Lang* discloses, and that the combination of *Lang* and *Fahlen* teaches, “a compliant portion” as recited in claim 1.

*an axial end guard mountable about one of the end mounting features, the axial end guard configured to prevent spooled filaments from traversing axially beyond the extremity of the mounting feature about which the axial end guard is mounted, wherein the end guard is removable from a longitudinal end of the core.*

Petitioner asserts, “*Lang* discloses [an axial end guard] in cylindrical

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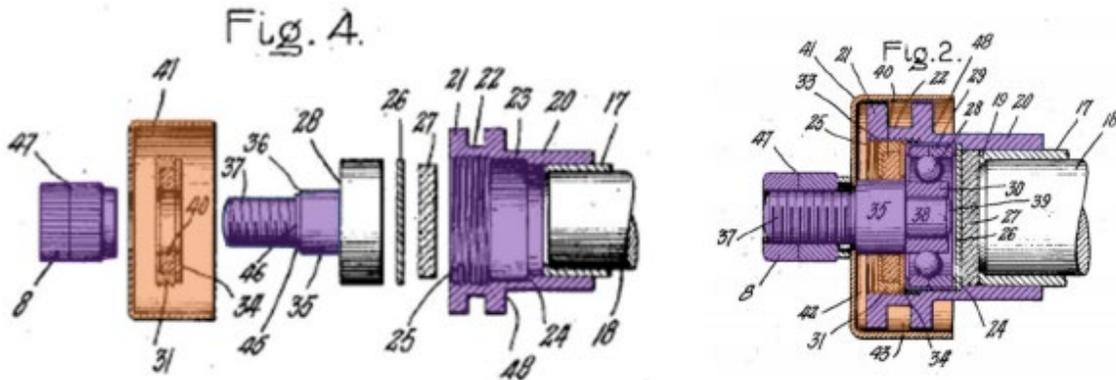
<sup>13</sup> U.S. Patent No. 4,429,430, issued Feb. 7, 1984 (Ex. 1010).

<sup>14</sup> U.S. Patent No. 6,810,559 B2, issued Nov. 2, 2004 (Ex. 1009).

<sup>15</sup> U.S. Patent Application Publication 2006/0272122 A1, published Dec. 7, 2006 (Ex. 1011).

cup-shaped thread guard 41, alone or in combination with nut 31, washer 34, and packing 40.” Pet. 33 (citing Ex. 1003 (Fester Decl.) ¶¶ 77–83).

Petitioner contends that “*Lang*’s bearing housing 20, bearing proper 28, stud 35, and supporting nut 8 disclose the claimed ‘end mounting features.’” *Id.* And, that, “[t]his configuration is shown unassembled in Figure 4 and assembled in Figure 2.” *Id.* at 34. The Petition includes annotated versions of Figure 4 (assembled) and Figure 2 (unassembled), reproduced below, to illustrate this arrangement.



*Id.* at 34. Annotated Figures 4 and 2 depict “Figs. 4, 2 (both annotated) (showing thread guard 41 (orange), mounted to stud 35 (purple) and held in place by knurled supporting nut 8 (purple), and showing nut 31, washer 34, and packing 40 (all orange) threaded onto bearing housing 20 (purple)).” *Id.*

Petitioner contends “thread guard 41 is ‘configured to prevent spooled filaments from traversing axially beyond the extremity of the mounting feature about which the axial end guard is mounted’” as recited in this limitation. Pet. 35 (citing Ex. 1003 (Fester Decl.) ¶ 79). To show this feature, the Petition states, “thread guard 41 includes central opening 44 that is ‘flat on one side, as indicated at 45, to correspond in shape to section 46 of the stud adjacent to shoulder 36 over which section the guard is located when [clamped] against shoulder 36’” (*id.* at 34–35 (quoting Ex. 1005,

3:115–123) (alteration in original); *see also id.* at Fig. 6) and “[h]aving the thread guard extend over the bearing housing ‘prevent[s] threads from wrapping around the hub of the bearing housing and climbing the shoulder 48’” (*id.* at 35 (quoting Ex. 1005, 4:4–7) (second alteration in original)).

To show that “the end guard is removable from a longitudinal end of the core” as recited in this limitation, the Petition quotes the following three passages from Lang (Pet. 36):

The interior of the bearing housing at one end is adapted to be pressed onto the brush tube for a distance sufficient to make a firm connection therewith and being tubular and having a flange, it is easily removable therefrom if necessary without injury to itself or the brush tube.

\* \* \*

The bearing is thus amply protected, at the same time being easily accessible by unscrewing the knurled nut 8, sliding off the thread guard 41 and unscrewing the retaining or clamping nut 31, the assembly and disassembly relation of these parts being shown more clearly in Fig. 4 [reproduced above].

\* \* \*

By the construction shown, the entire bearing assembly may be easily taken apart for cleaning, repair or replacement of the parts, and the entire housing may be removed from the brush cylinder to replace the brush when worn out or if damaged.

Ex. 1005, 3:8–15, 3:108–114, 4:65–70.

Other than disputing that Petitioner has shown Lang discloses the recited “end mounting features,” Patent Owner does not dispute that Lang discloses this limitation. Petitioner’s showing with regard to this limitation is supported and persuasive. *See* Pet. 33–37. We find Lang discloses “an

axial end guard” (thread guard 41 alone, or in combination with nut 31, washer 34, and packing 40) as recited in claim 1.

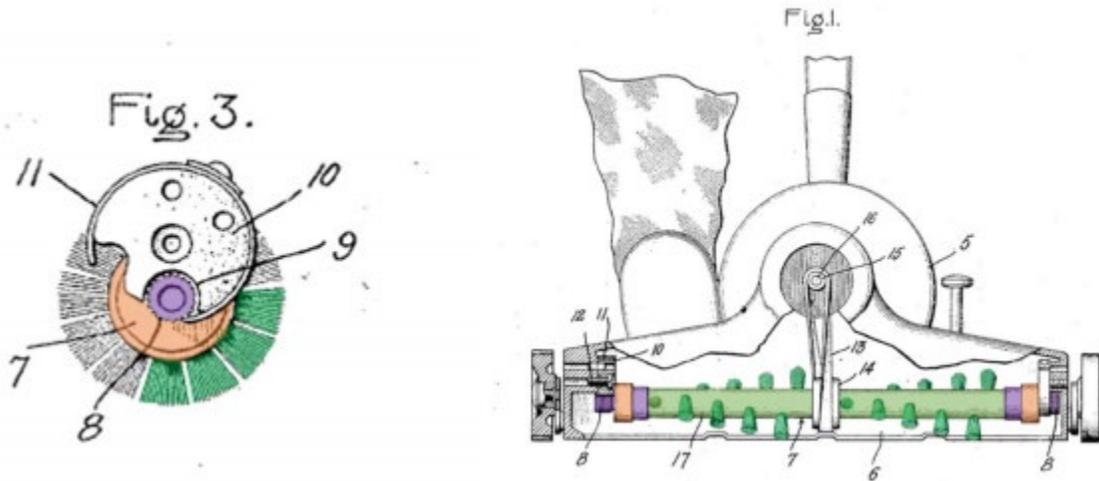
Summary as to Claim 1

Considering claim 1 of the '303 patent and the asserted prior art and other evidence, Petitioner's unpatentability showing is factually and legally sound. Based on the foregoing analysis, we conclude that claim 1 of the '303 patent is unpatentable in view of Lang alone and in combination with Fahlen.

Claim 4

*The floor cleaner of claim 1, wherein the outward radial extension of the brush is greater than the outward radial extension of the axial end guard mounted on the end mounting feature.*

Petitioner relies on Lang for disclosing the additional limitation of dependent claim 4. Pet. 38–39. In support, Petitioner provides annotated Figures 1 and 3, reproduced below. *Id.*



Annotated “Figures 1 and 3 show the radial extension of the brush (green) is greater than that of the thread guard (orange).” *Id.* Patent Owner does not specifically address claim 4 and Petitioner's assertions regarding the

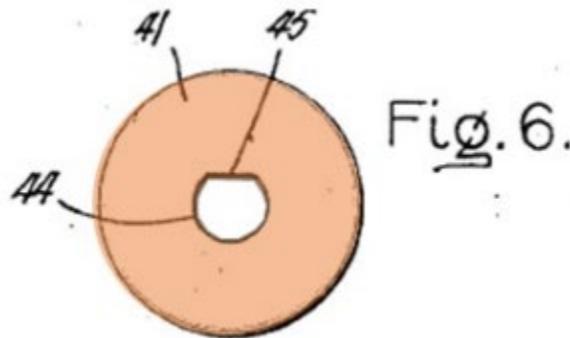
limitations recited in claim 4 are undisputed. *See generally* PO Resp.

We find, based on Petitioner's showing as summarized above, that Lang discloses the limitation recited in claim 4 and conclude that claim 4 is unpatentable in view of Lang with or without Fahlen.

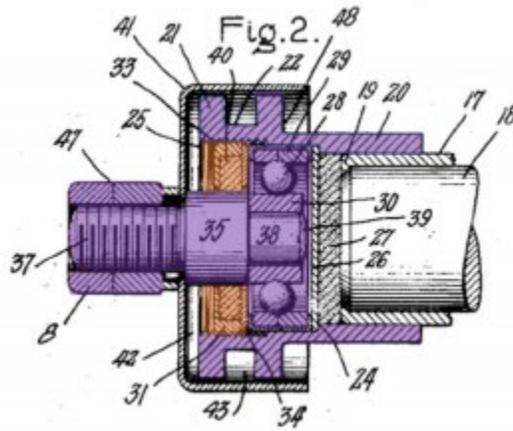
Claim 5

*The floor cleaner of claim 1, wherein the axial end guard defines a through hole through which extends the end mounting feature about which the axial end guard is mounted.*

Petitioner relies on Lang for disclosing the additional limitation of dependent claim 5. Pet. 39–40. In support, Petitioner provides annotated Figure 6, reproduced below. *Id.* at 39.



Annotated “Figure 6 . . . illustrates a cross-sectional view of thread guard 41 that includes central opening 44 through which section 46 of stud 35 extends.” *Id.* (citing Ex. 1005, 2:115-125). And, Petitioner provides annotated Figure 2, reproduced below. *Id.* at 40.



Annotated “Figure 2 shows stud 35 (purple) passing through the central openings of nut 31, washer 34, and packing washer 40 (all orange).” *Id.* (citing Ex. 1005, 2:70-77, Fig. 7 (showing the central opening of nut 31)).

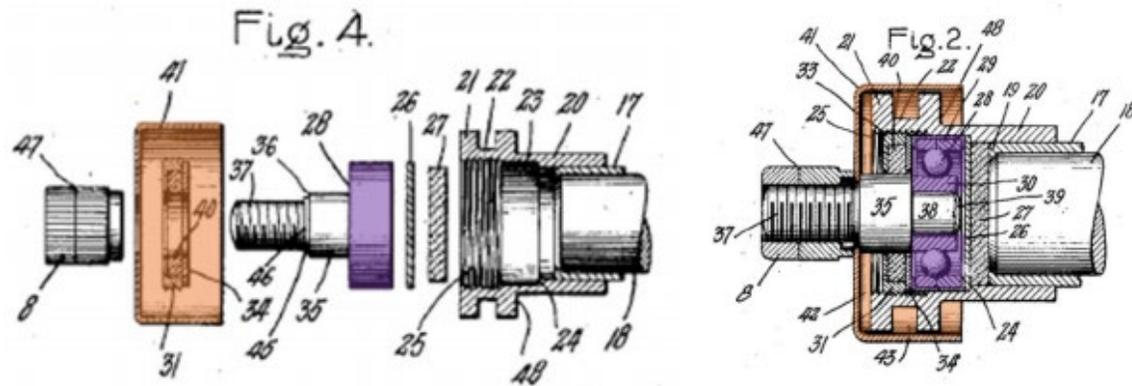
Patent Owner relies on its claim construction argument that claim 1’s “end mounting features” must rotate in discussing dependent claim 5. PO Resp. 24. As noted above, we reject this claim construction argument. Other than contesting that the cited art does not disclose “end mounting features” that rotate, Patent Owner does not dispute that the cited art discloses the further limitation recited in dependent claim 5. *Id.*

We find that Lang discloses the limitation recited in claim 5 and conclude that claim 5 is unpatentable in view of Lang with or without Fahlen.

#### Claim 6

*The floor cleaner of claim 1, further comprising a bearing circumscribed by the axial end guard, wherein the core is rotatable relative to the bearing.*

Petitioner relies on Lang for disclosing the additional limitation of dependent claim 6. Pet. 40–43. In support, Petitioner provides annotated Figures 2 and 4, reproduced below. *Id.* at 42.



“[A]s seen in Figures 2 and 4, Lang’s thread guard 41 (orange) circumscribes bearing proper 28 (purple) because the cup-shaped thread guard is installed over and surrounds bearing proper 28” and “as Lang explains regarding Figure 2, nut 31 is tightened to ‘fully seat the bearing [proper 28]’” and “[w]hen tightened, washer 34, which is ‘placed between [nut 31] and the bearing,’ ‘engages only the outer race of the bearing.’” *Id.* at 41–42 (citing Ex. 2005, 2:43–46, 2:52–58) (second and fourth alteration in original).

With regard to the “wherein” clause which recites, “the core is rotatable relative to the bearing,” the Petitioner cites the following paragraph in Lang (Pet. 43):

In operation, supporting nut 8, stud 35, the thread guard 41 and the inner race 30 of the bearing are held stationary, while the brush tube or cylinder 17 bearing housing 20, disk 26, packing disk 27, retaining nut and packing 31 and 40 respectively, and the outer bearing race 29 all rotate about a common axis of the stud 35, or, more briefly, the stud, thread guard and inner race are stationary, while the housing, outer race and packings rotate with the brush.

Ex. 1005, 3:54–64.

In addition to its claim construction argument relating to the “core”

limitations, Patent Owner presents a separate argument relating to claim 6. *See* PO Resp. 32–36. Patent Owner’s argument is based on the use of “further comprising” in claim 6. *Id.* Specifically, Patent Owner argues,

Claim 6 recites “[t]he floor cleaner of claim 1, **further comprising** a bearing...” (emphasis added), signaling that the recited “bearing” is an additional structure within the recited “floor cleaner” that is distinct from the earlier recited structures, including the “driven brush” and its constituent components, such as its “end mounting features,” previously recited in claim 6 via its dependency from claim 1.

*Id.* at 32–33 (alterations in original). Thus, Patent Owner argues that the same bearing in the prior art cannot be both a part of the “end mounting features” as recited in claim 1 and the bearing recited in claim 6. In response to this argument, Petitioner argues this argument is “unsupportable” because “claim 6’s broad recitation that the cleaner ‘further comprises a bearing’ does not mean that bearing must be separate from the previously recited ‘end mounting features.’ [Patent Owner] cites no case to support such an overly narrow reading of the open-ended phrase ‘further comprises.’”<sup>16</sup> Reply 23. We agree with Petitioner and reject this argument.

Claim 1 recites, “an elongated core having . . . end mounting features” and sets forth characteristics of the “end mounting features” of the “core”: “extending beyond respective axial ends of the outer surface of the core and defining a central longitudinal axis of

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<sup>16</sup> “In the patent claim context, the term ‘comprising’ is well understood to mean ‘including but not limited to’.” *CIAS, Inc. v. Alliance Gaming Corp.*, 504 F.3d 1356, 1360 (Fed. Cir. 2007).

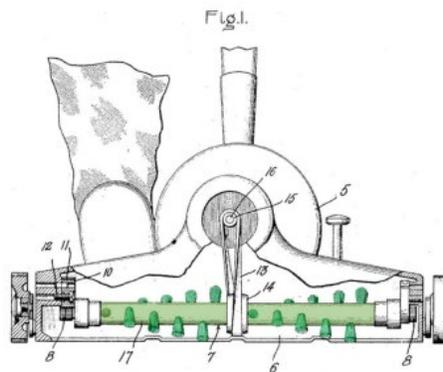
rotation.” Ex. 1001, 17:33–36. Claim 6 further specifies that, in addition to “an elongated core having . . . end mounting features,” the floor cleaner is required to include a “bearing.” Petitioner has shown that Lang meets all these recited limitations. Patent Owner does not explain why the same structure (the bearing of Lang) may not be used to show the prior art discloses or teaches or suggests both “an elongated core having . . . end mounting features” with the recited characteristics and a “bearing.”

We find that Lang discloses the limitation recited in claim 6 and conclude that claim 6 is unpatentable in view of Lang with or without Fahlen.

#### Claim 7

*The floor cleaner of claim 1, wherein the compliant portion further comprises multiple floor cleaning bristles extending radially outward from the core.*

As to the additional limitation of dependent claim 7, Petitioner contends, “Lang discloses this element . . . , and/or Lang in view of Fahlen renders this element obvious.” Pet. 43. In support, Petitioner provides annotated Figure 1, reproduced below. *Id.* at 44.



As depicted in annotated Figure 1, “Lang’s brush includes ‘multiple floor cleaning bristles extending radially outward from the core.’” *Id.* at 43.

Petitioner further contends, “if [Patent Owner] argues the claimed ‘compl[ia]nt portion’ also requires a ‘compliant flap’ or ‘beater,’ *Lang* in view of *Fahlen* renders this element obvious.” *Id.* at 44.

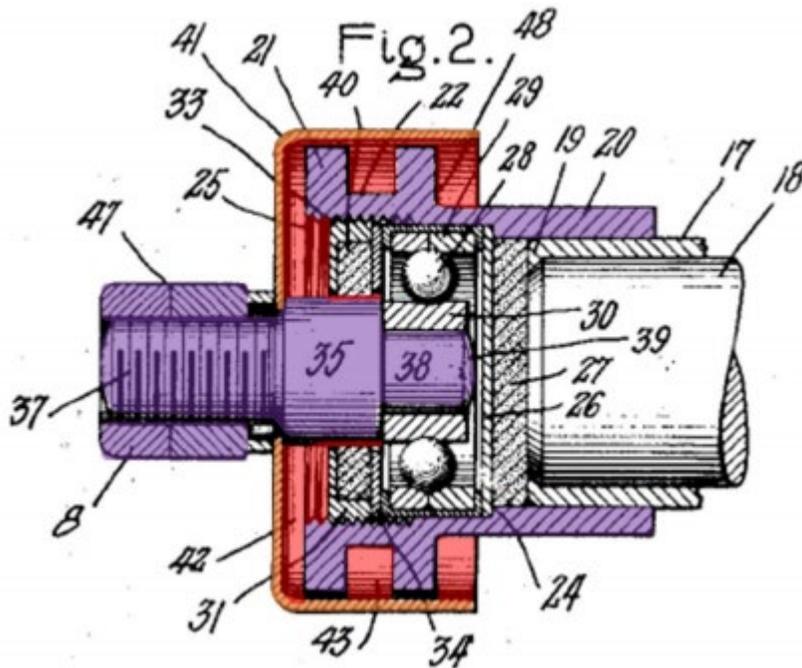
Patent Owner does not specifically address claim 7 and Petitioner’s assertions regarding the limitation recited in claim 7 are undisputed. *See generally* PO Resp.

We find that *Lang* discloses the limitation recited in claim 7 and conclude that claim 7 is unpatentable in view of *Lang* with or without *Fahlen*.

Claim 9

*The floor cleaner of claim 1, wherein the axial end guard forms a labyrinth seal about the end mounting feature on which the axial end guard is mounted.*

Petitioner contends that *Lang* discloses the further limitation recited in dependent claim 9. Pet. 44. In support, Petitioner provides annotated Figure 2, reproduced below. *Id.* at 46.



In Figure 2, “*Lang* shows the labyrinth seal (red) formed by the thread guard (orange) about the bearing structure (purple), including along the non-threaded portion of stud 35 (purple) that protects bearing proper 28 (uncolored).” *Id.* at 45–46. And, the Petition also states:

*Lang* teaches that bearing proper 28 is protected by “two dead air chambers or spaces 42 and 43 and a sealing packing 40, which is located between two sealing walls provided by the bearing clamping ring or nut 31 and washer 34.” *Lang* [Ex. 1005], 2:97-102. These features form a labyrinth seal that protects the bearings from debris.

*Id.* at 45.

Patent Owner does not specifically address claim 9 and Petitioner’s assertions regarding the limitation recited in claim 9 are undisputed. *See generally* PO Resp.

We find that *Lang* discloses the limitation recited in claim 9 and conclude that claim 9 is unpatentable in view of *Lang* with or without *Fahlen*.

#### Claim 10

Claim 10 is an independent claim that includes most of the same limitations as independent claim 1. *Compare* Ex. 1001, 17:27–45 (claim 1), *with id.* at 18:16–36 (claim 10). However, the fourth limitation of claim 1 recites, “at least one *driven* brush” (*id.* at 17:31 (emphasis added)) and the fourth limitation in claim 10 does not recite the word “driven” (*id.* at 18:21). Another difference between claim 1 and claim 10 is that claim 10 in the fifth limitation recites “the core rotatable relative to the cleaning assembly housing.” *Id.* at 18:26–27. Petitioner relies on its showing as to claim 1 for this limitation of claim 10. Pet. 47 (“[A]s noted above, *Lang*’s brush is

rotatably mounted to the nozzle body (the claimed ‘cleaning assembly housing’).”).

There are two additional differences between claim 1 and claim 10 recited in the seventh (last) limitation. *Compare* Ex. 1001, 17:40–45 (claim 1), *with id.* at 18:31–36 (claim 10). Petitioner accounts for these differences (referred to by Petitioner as elements 1(h) and 10(h)) as follows:

Element 10(h) is substantially identical to element 1(h) with two differences. Fester [Ex. 1003], ¶ 105. First, element 10(h) additionally requires that the axial end guard is “mountable in a fixed axial position relative to the core.” Both thread guard 41 and nut 31 (and washer 34 and packing 40) disclose this feature. Fester [Ex. 1003], ¶ 106. Thread guard 41 is keyed together with shoulder 36 of stud 35 and “drawn tightly against the shoulder 36” by tightening supporting nut 8. *Lang* [Ex. 1005], 2:115-131. A skilled artisan would have understood from this description and Figure 2 that *Lang*’s thread guard is mounted in a fixed axial position relative to the core 18. Fester [Ex. 1003], ¶ 106. Likewise, *Lang* discloses that nut 31 and washer 24 are tightened with a screwdriver to seat the bearing. *Lang* [Ex. 1005], 2:43-58. When the nut is tightened, the washer engages the bearing and the prick-punched nut prevents it from loosening. *Id.* *Lang* thus discloses this requirement of element 10(h). Fester [Ex. 1003], ¶ 106.

Second, while element 1(h) recites “beyond the extremity of the mounting feature about which the axial end guard is mounted,” element 10(h) more broadly recites “beyond the extremity of at least one of the end mounting features.” Thus the unpatentability proofs discussed in Section VII.A.1.h [Pet. 33–37] demonstrate that *Lang* discloses this feature and the rest of element 10(h). Fester [Ex. 1003], ¶ 107.

Pet. 48–49. We determine that Petitioner shows that all the limitations of claim 1 are disclosed in *Lang* and are taught or suggested by the combination of *Lang* and *Fahlen*.

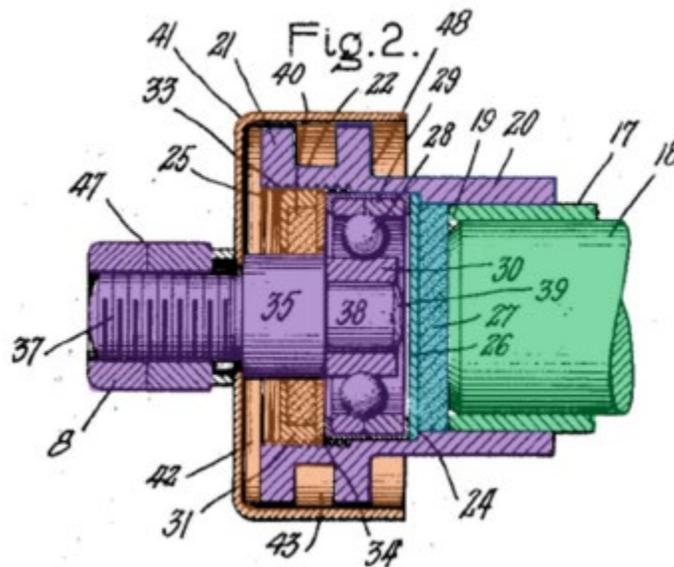
Patent Owner presents the same arguments for claim 10 as it does for claim 1. *See, e.g.*, PO Resp. 5 (“[A]ll grounds advanced in the Petition are deficient because they fail to properly address the requirements of [the ‘core’ limitations] of independent claims 1 and 10.”). For the reasons discussed above, we reject Patent Owner’s arguments relating to the “core” limitations.

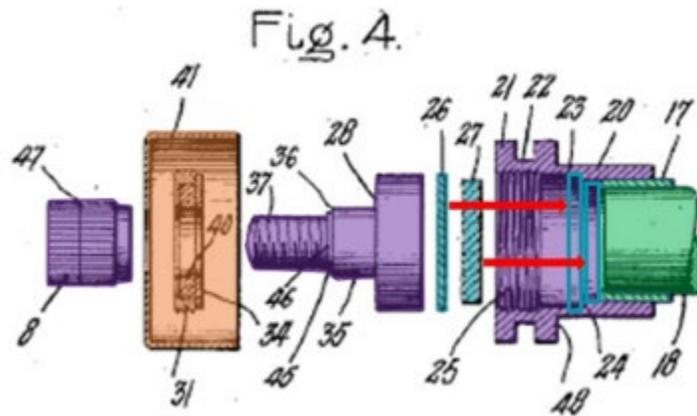
Considering claim 10 of the ’303 patent and the asserted prior art, Lang alone and in combination with Fahlen, Petitioner’s unpatentability showing is factually and legally sound. Based on the foregoing analysis, we conclude that claim 10 of the ’303 patent is unpatentable.

Claim 11

*The floor cleaner of claim 10, further comprising an end cap disposed at an axial end of the core, between the core and the mounted axial end guard.*

Petitioner contends that Lang discloses the further limitation recited in dependent claim 11. Pet. 49. In support, Petitioner provides annotated Figures 2 and 4, reproduced below. *Id.* at 50.





Annotated Figures 2 and 4 depict partial side views of the end of a cleaning roller. Ex. 1005, 3:60–61, 3:64–65. With regard to how these annotated figures illustrate the limitation of claim 11, the Petition states:

*Lang* discloses this element in metal disk 26 and/or packing 27. Fester [Ex. 1003], ¶¶ 108-111. Figure 4 shows cylindrical bearing housing 20 (purple) secured at the end of the brush (green). *Lang* [Ex. 1005], 1:100-105, 2:4-7. The bearing includes “[s]houlder 24 [which supports] metal disk 26” (teal) which slides into the bearing chamber and “forms a closure for the inner end of [the] chamber when seated on the shoulder” (teal outline). *Id.*, 2:25-29 (emphases added). Packing 27 (teal)—also “a simple flat disk”—is disposed between metal disk 26 and the end of the brush tube. *Id.*, 2:29-33. “Seated against disk 26 is the bearing proper 28 [(purple)],” which is covered by washer 34 that is attached to stud 35 (purple) and secured by nut 8 (purple). *Id.*, 2:34-58. . . .

As shown by comparing Figure 4 . . . with Figure 2 . . . thread guard 41 (orange) slides over bearing housing 20 (purple) and sandwiches bearing proper 28 (purple), metal disk 26 (teal), and packing 27 (teal) between itself and brush core 18 (green). *See id.*, 2:59-96; Fester [Ex. 1003], ¶ 109. . . .

The skilled artisan would have understood metal disk 26 and/or packing 27 as the “end cap,” because both are “disposed at an axial end of the core [*Lang*’s core 18], between the core and the mounted axial end guard [*Lang*’s thread guard 41 and/or nut 31, washer 34, and packing 40],” as shown above. Fester [Ex. 1003], ¶ 110.

*Id.* at 49–51.

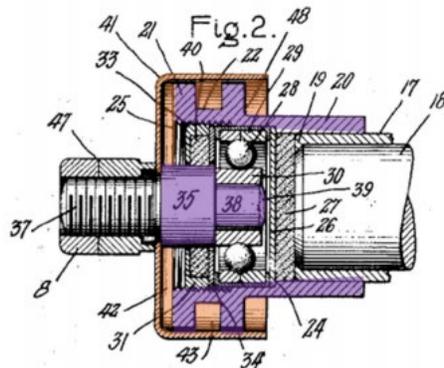
Patent Owner does not specifically address claim 11 and Petitioner’s assertions regarding the limitation recited in claim 11 are undisputed. *See generally* PO Resp.

We find that Lang discloses the limitation recited in claim 11 and conclude that claim 11 is unpatentable in view of Lang with or without Fahlen.

Claim 14

*The floor cleaner of claim 10, wherein the axial end guard is mountable to circumscribe one of the end mounting features extending beyond respective axial ends of the outer surface of the core.*

Petitioner contends that Lang discloses the further limitation recited in dependent claim 14. Pet. 51 (“Lang discloses this element because thread guard 41 is mountable to circumscribe stud 35 and the bearing housing’s flanged end 21, which both extend beyond the axial end of outer surface 17 of core 18.”). In support, Petitioner provides annotated Figure 2, reproduced below. *Id.* at 50.



Annotated Figure 2 depicts the end of a cleaning roller. Ex. 1005, 3:60–61. With regard to how this annotated figure illustrates the limitation of claim

14, the Petition states:

*Lang*'s "cylindrical cup-shaped" thread guard 41 (orange) "surrounds and substantially encloses" flanged end 21 of the bearing housing (purple). *Lang* [Ex. 1005], 2:78-82. It also surrounds and substantially encloses stud 35 (purple) of the bearing unit. . . .

*Lang* explains regarding Figure 6, that thread guard 41 includes central opening 44 that is "flat on one side" to key together with "section 46 of the stud adjacent to shoulder 36" of stud 35 "when clamped against shoulder 36." *Lang* [Ex. 2005], 2:115-125. Thus, thread guard 41 and stud 35 are stationary, while the cylinder 17 and core 18 rotate. *Id.*, 3:54-64; Fester [Ex. 1003], ¶ 114. . . .

*Lang*'s brush core 18 is covered by brush cylinder 17. *Lang* [Ex. 1005], 1:100-105. A skilled artisan would have understood brush cylinder 17 to disclose the claimed "outer surface of the core." Fester [Ex. 1003], ¶ 115. *Lang* discloses that the end mounting features (e.g., bearing housing 20 and stud 35) extend beyond the axial end of brush cylinder 17.

Thus, *Lang*'s relationship between thread guard 41 and bearing housing 20 and stud 35 discloses this feature. Fester [Ex. 1003], ¶ 116.

Pet. 52–53.

Patent Owner does not specifically address claim 14 and Petitioner's assertions regarding the limitation recited in claim 14 are undisputed. *See generally* PO Resp.

We find that *Lang* discloses the limitation recited in claim 14 and conclude that claim 14 is unpatentable in view of *Lang* with or without *Fahlen*.

#### Claim 15

*The floor cleaner of claim 10, wherein the compliant portion further comprises multiple floor cleaning bristles extending radially outward from the core.*

The additional limitation of dependent claim 15 is identical to the limitation of claim 7 that depends from claim 1. *Compare* Ex. 1001, 18:53–55 (claim 15), *with id.* at 18:7–9 (claim 7). Petitioner relies on its showing with regard to claims 1 and 7 to establish, “Lang discloses this element . . . and/or *Lang* in view of *Fahlen* renders it obvious.” Pet. 43.

Patent Owner does not specifically address claim 15 and Petitioner’s assertions regarding the limitation recited in claim 15 are undisputed. *See generally* PO Resp.

We find that Lang discloses the limitation recited in claim 15 and conclude that claim 15 is unpatentable in view of Lang with or without Fahlen.

#### Summary

Considering claims 1, 4–7, 9–11, 14, and 15 of the ’303 patent, the asserted prior art and other evidence, and the arguments of the parties, Petitioner’s unpatentability showing is factually and legally sound. Based on the foregoing analysis, we conclude that Petitioner has met its burden of showing that claims 1, 4–7, 9–11, 14, and 15 of the ’303 patent are unpatentable in view of Lang alone and in combination with Fahlen.

#### *F. Claim 8: Consideration of Alleged Obviousness in View of (1) Lang and Krier and (2) Lang, Fahlen, and Krier*

Petitioner asserts that claim 8 which depends from claim 1 is unpatentable as obvious in view of (1) Lang and Krier and (2) Lang, Fahlen, and Krier. Pet. 5, 53–56. Claim 8 recites:

*The floor cleaner of claim 7, wherein the bristles are disposed about the core in multiple rows, each row forming a substantially V-shaped groove configuration along the core.*

Ex. 1001, 18:10–12. We begin with a description of the disclosure of Krier

and then consider Petitioner’s undisputed showing as to the additional elements of dependent claim 8.

*1. Krier (Ex. 1012)*

Krier relates to “floor maintenance machines.” Ex. 1012, 1:29–30. The machine includes brush 14 having bristles arranged in a herringbone or V-shaped pattern, which moves particles toward the apex of the V so that the particles will be picked up more easily by the vacuum. *Id.* at 7:3–9, Fig. 2.

*2. Discussion*

Petitioner contends, “*Lang* teaches a floor cleaner with a bristled brush, ‘wherein the bristles are disposed about the core in multiple rows’” and “*Krier* teaches the limitations of claim 8 by disclosing ‘brush 14 [with] bristles arranged in a herringbone or V-shaped pattern.’” Pet. 53–54 (alteration in original). Petitioner’s contentions are supported by the cited art.

According to Petitioner, “the skilled artisan would have recognized that adding Krier’s V-shaped bristles to Lang’s vacuum cleaner would have been the substitution of one known element (Krier’s V-shaped bristles) for another (Lang’s bristles) to achieve the predictable result of allowing the debris to ‘be picked up more easily.’” Pet. 55 (citing Ex. 1003 (Fester Decl.) ¶ 123). We find a skilled artisan would have been motivated to combine the relevant teachings of Krier with the relevant teachings of Lang or Lang and Fahlen.

Patent Owner does not specifically address claim 8 and Petitioner’s assertions regarding claim 8 are undisputed. *See generally* PO Resp.

We find that Krier discloses the limitations recited in claim 8 and

conclude that claim 8 is unpatentable as obvious in view of (1) Lang and Krier and (2) Lang, Fahlen, and Krier.

*G. Claims 1, 2, 4–12, 14, 15: Consideration of Alleged Obviousness in View of (1) Brundula and Lang and (2) Brundula, Lang, and Fahlen*

Petitioner asserts that claims 1, 2, 4–12, 14, and 15 are unpatentable as obvious in view of (1) Brundula and Lang and (2) Brundula, Lang, and Fahlen. Pet. 5, 56–87. The claims challenged on these grounds include claims 2 and 12 that were not challenged by Petitioner on the grounds already discussed above and, thus, claims 2 and 12 have not been previously considered in this Decision. The remaining claims (claims 1, 4–11, 14, and 15) have already been considered in this Decision and, for reasons already discussed, been found to be unpatentable. Nonetheless, in the analysis that follows, we consider all the challenged claims based on the prior art combinations that include Brundula. We begin with a description of the disclosure of Brundula.

*1. Brundula (Ex. 1013)*

Brundula relates to “a brushroll arrangement for floor care appliances.” Ex. 1013, 1:7–8. Brundula’s brushroll comprises a core (dowel 10) having an outer periphery 16. *Id.* at 3:42–43. A plurality of bristle tufts 80, 84 extend radially outward from the core. Figs. 1, 3, 7. Brundula’s brushroll also includes a thread guard as seen in Figure 5, reproduced below.



explicitly depict or describe a floor cleaner. *Id.* at 57 (“*Brundula* does not depict the vacuum cleaner in which its ‘brushroll or agitator is provided.’”). However, *Brundula* does teach that “the present invention relates to a brushroll arrangement for floor care appliances” and that “[t]he invention is particularly applicable to brushrolls for vacuum cleaners.” Ex. 1013, 1:7–10.

Petitioner contends that one of ordinary skill in the art would have understood that *Brundula*’s brushroll would have been incorporated into a vacuum cleaner and that such a vacuum cleaner would include a chassis and cleaning assembly. Pet. 56–57. Petitioner asserts that *Lang* discloses these elements with a brushroll, and because *Brundula* discloses using a brushroll in “a vacuum cleaner,” there is “motivation for combining [*Brundula*’s] brushroll with the floor cleaner described in *Lang*.” *Id.* at 59 (citing Ex. 1003 (Fester Decl.) ¶ 132). According to Petitioner, *Brundula* discloses a “compliant portion” because *Brundula*’s bristles are designed to be “bent backwards” and that one tuft of bristles bends toward and is supported by another tuft as it “encounters a surface meant to be cleaned.” *Id.* at 67 (citing Ex. 1013, 3:29–30, 5:33–37, Fig. 7). Petitioner also relies on *Brundula*’s bristles to meet the “floor cleaning bristles” as recited in claims 7 and 15. Pet. 78, 87.

Petitioner provides an annotated Figure 5 from *Brundula*, reproduced below, to show the “end mounting features” of the challenged claims. *Id.* at 64.

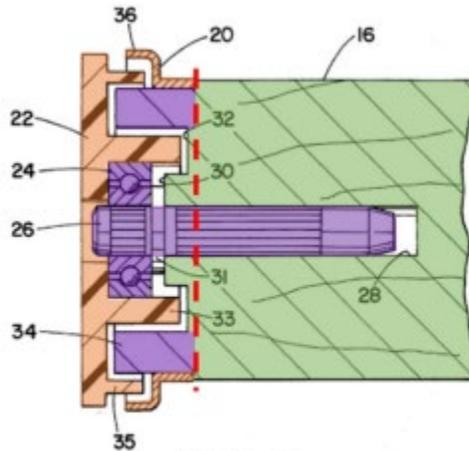


FIG. 5

Annotated Figure 5 depicts, “a cross-sectional view of an end portion of the brushroll.” Ex. 1013, 3:24–25. The Petition states:

*Brundula*’s dowel 10 includes end mounting features (purple). Specifically, at each end of the dowel (red dashed line), is a “suitable end assembly” that allows for the “rotation of the dowel . . .” *Brundula* [Ex. 1013], 3:50-4:7. This end assembly includes pin 26 mounted on one side to dowel 10 via hole 28 and on the other side to bearing 24. *Id.*, 3:57-59. It also includes annular rib 34 defined on the dowel end face with a narrower outer diameter than that of the outer periphery 16. *Id.*, 3:53-55, 3:64-65. Together, pin 26, bearing 24, and annular ribbed portion 34 (purple) disclose the claimed “end mounting features.” Fester [Ex. 1003], ¶ 143.

Pet. 63.

Patent Owner argues that the elements of the brushroll of *Brundula* cited by Petitioner for the “end mounting features” of the challenged claims do not satisfy the “core” limitations, because the cited elements do not all rotate. PO Resp. 21–24. Specifically, Patent Owner argues:

[A] POSITA would have understood bearing 24 to be stationary relative to rotating dowel 10 because *Brundula* discloses bearing 24 as having a ball bearing structure, which a POSITA would have understood to have one stationary race. Ex-2016

[Coates Decl.], ¶¶59-60. . . .

Brundula describes that end cap 22 is “mounted on” bearing 24, and that bearing 24 is also “mounted on” pin 26. Brundula [Ex. 1013], 3:55-59. Based on this disclosure and the depictions of these components in Figure 5, a POSITA would have understood that outer race of bearing 24 is stationary since it is fixedly attached to end cap 22, which is also stationary. Ex-2016 [Coates Decl.], ¶61. Thus, bearing 24 would not be capable of rotating relative to a central longitudinal axis of dowel 10, which the Petition maps to the recited “core.” *Id.* This understanding is consistent with a POSITA’s knowledge of ball bearing structures including a stationary part (e.g., one stationary race of the ball bearing structure). *Id.*

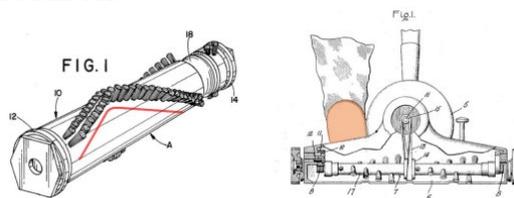
*Id.* at 22–23. However, this alleged distinction is based on Patent Owner’s claim construction argument that all parts of the “core” must rotate including all elements of the “end mounting features.” *Id.* at 24 (“Petitioner’s mappings to . . . Brundula for the ‘end mounting features’ are . . . deficient because they include one or more components that would not be understood to rotate as part of what Petitioner identifies as representing the ‘core.’”). As we reject Patent Owner’s claim construction argument, we do not find Patent Owner’s efforts to distinguish Brundula on the recited “core” or “end mounting features” limitations effective. We find that Petitioner has met its burden of showing the “core” limitations including the “end mounting features” are taught by Brundula.

Petitioner contends, “[w]hile *Brundula* does not include a figure showing the vacuum cleaner into which its brushroll is incorporated, a skilled artisan would have understood from *Brundula* that it would have been incorporated into a vacuum cleaner.” Pet. 56 (citing Ex. 1003 (Fester Decl.) ¶ 126). “And the skilled artisan would have understood that the vacuum cleaner would have included a chassis and a cleaning assembly—

conventional elements in all vacuum cleaners.” *Id.* at 56–57. Petitioner asserts, “it is indisputable that vacuum cleaners were ubiquitous before the ’303 patent” and “*Lang* discloses these conventional features, and it would have been obvious to incorporate *Brundula*’s brushroll into the conventional floor cleaner of *Lang*.” *Id.* at 57 (citing Ex. 1003 (Fester Decl.) ¶¶ 127, 129).

With regard to the motivation to combine the teachings or suggestions of *Brundula* relating to the disclosed brushroll with the teachings or suggestions of *Lang* relating to the disclosed vacuum cleaner, the Petition provides:

Moreover a skilled artisan would have been motivated to combine the teachings of *Brundula* with a known cleaner, such as that disclosed in *Lang*, because *Brundula* expressly discloses that its brushroll is “for a vacuum cleaner,” *Brundula* [Ex. 1013], Abstract, and that it was known to use brushrolls in a vacuum cleaners [sic], *id.*, 1:14-15. Fester [Ex. 1003], ¶ 131. *Brundula* explains its “brushroll is meant to cooperate with a centrally located inlet of a nozzle base of a vacuum cleaner,” *Brundula* [Ex. 1013], 1:36-38; *see also id.*, 4:35-37, echoing the nozzle structure disclosed in *Lang*. Fester [Ex. 1003], ¶ 131. In particular, as shown below, *Brundula*’s V-shaped bristle pattern (outlined in red) is arranged slightly to the left-hand side of the center of the brushroll, which aligns with *Lang*’s suction port (orange) that is also slightly offset to the left-hand side of the center of the brushroll.

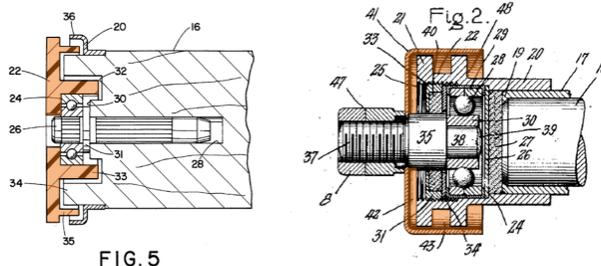


*Brundula*, Fig. 1 (annotated); *Lang*, Fig. 1 (annotated). Thus, *Brundula* provides an express teaching, suggestion, and motivation for combining its brushroll with the floor cleaner described in *Lang*. Fester [Ex. 1003], ¶ 132.

*Id.* at 58–59. We agree with Petitioner that Brundula provides an express teaching that its brushroll would be suitable for use in a vacuum cleaner and that this express teaching supports finding a motivation to combine the relevant teachings of these references. *See Ortho-McNeil Pharm., Inc. v. Mylan Labs., Inc.*, 520 F.3d 1358, 1364–65 (Fed. Cir. 2008) (noting that the teaching-suggestion-motivation test, flexibly applied, remains an important tool in an obviousness analysis).

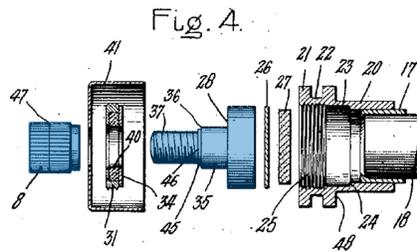
Patent Owner argues that Petitioner has failed to establish a motivation to combine the relevant teachings of Brundula and Lang such that the brushroll taught by Brundula would be incorporated into the vacuum cleaner taught by Lang. PO Resp. 25–32. Patent Owner contends, “Petitioner advances conclusory assertions since they fail to explain with particularity how Brundula’s brushroll would have been incorporated into Lang’s specific vacuum cleaner.” *Id.* at 28. “Because Petitioner did not identify a particular purported combination of Brundula’s brushroll with Lang’s vacuum, Petitioner cannot identify a particular motivation to make that unidentified combination.” *Id.* Specifically, Patent Owner argues:

For example, Petitioner does not address how a POSITA could have modified the end assembly of Brundula’s brushroll to incorporate structures that Lang discloses as securing thread guard 41 to its cleaning assembly housing, as shown below. Ex-2016 [Coates Decl.], ¶73.



Brundula, Figure 5 (left; annotated); Lang, Figure 2 (right; annotated)

Brundula's end cap 22 (highlighted orange in the left figure) is fixed to a housing and secured to dowel 10 using bearing 24. Brundula [Ex. 1013], 3:49-63. In contrast, Lang's thread guard 41 (highlighted in orange in the right figure) is secured to wooden dowel or core 18 using bearing housing 20 in combination with a supporting nut 8 and fixed stud 35. The supporting nut 8 and fixed stud 35 are highlighted below in the annotated version of Lang's Figure 4. Ex-2016 [Coates Decl.], ¶74.



Lang, Figure 4 (annotated)

Because Brundula's brushroll does not include any component analogous to Lang's fixed stud 8 and nut 35, it is entirely unclear what structural assembly the Petitioner envisions as performing the coupling function of these components in its proposed combination. Ex-2016 [Coates Decl.], ¶75.

PO Resp. 28–29.

Patent Owner also argues Petitioner fails to show that a skilled artisan would have been motivated to combine the teachings of Brundula and Lang to meet the limitations in claims 1 and 10 that “the end guard is removable from a longitudinal end of the core.” PO Resp. 30–32. Specifically, Patent Owner argues that Petitioner “fails to explain with particularity whether and how the modified system would have enabled a user to access Brundula's end assemblies to thereby permit removal of components of those end assemblies (*i.e.*, the end caps 22 and/or the thread guard 20) in the manner proposed in the Petition.” *Id.* at 31 (citing Ex. 2016 (Coates Decl.) ¶ 78).

After considering the arguments and weighing the evidence of the

parties on this issue, we are persuaded by Petitioner’s contentions and evidence on the issue of motivation to combine the relevant teachings of Brundula and Lang. Patent Owner has not argued or presented any credible, persuasive evidence<sup>17</sup> that the proposed combination would have been beyond the capabilities of the skilled artisan. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007) (“A person of ordinary skill is also a person of ordinary creativity, not an automaton.”). Patent Owner does not argue that combining the relevant teachings of Brundula and Lang as in the device recited in the challenged claims would have been “uniquely challenging or difficult for one of ordinary skill in the art.” *See Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007) (citing *KSR*, 550 U.S. at 418–19). And, the proper consideration is what the references would have taught or suggested to those of ordinary skill in the art not whether the structure disclosed in a reference may be bodily incorporated into the structure of another reference. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (“The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference. . . . Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.”); *In re*

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<sup>17</sup> We have considered the cited portions of the Declaration of Donald A. Coates, Ph.D. (Ex. 2016) and note that Dr. Coates does not address whether the proposed combination would have been beyond the capabilities of the skilled artisan. Rather, the cited paragraphs appear to be nearly verbatim duplicates of passages in the Response that do not differ at all in substance. *Compare* Ex. 2016 ¶¶ 70–78, *with* PO Resp. 26–32. *See* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).

*Nievelt*, 482 F.2d 965, 968 (CCPA 1973) (“Combining the teachings of references does not involve an ability to combine their specific structures.”). Based on the totality of the evidence, we find that adapting a prior art brushroll such as that taught by *Brundula* into a commonly available device such as a vacuum cleaner as taught by *Lang* would have been obvious to one of ordinary skill in the art with knowledge of the relevant teachings and suggestions of the cited art.

Patent Owner also challenges Petitioner’s showing with regard to dependent claim 2 of the ’303 patent.<sup>18</sup> PO Resp. 35–37. Claim 2 recites:

*The floor cleaner of claim 1, wherein at least a portion of the axial end guard forms an interference fit with the end mounting feature about which the axial end guard is mounted.*

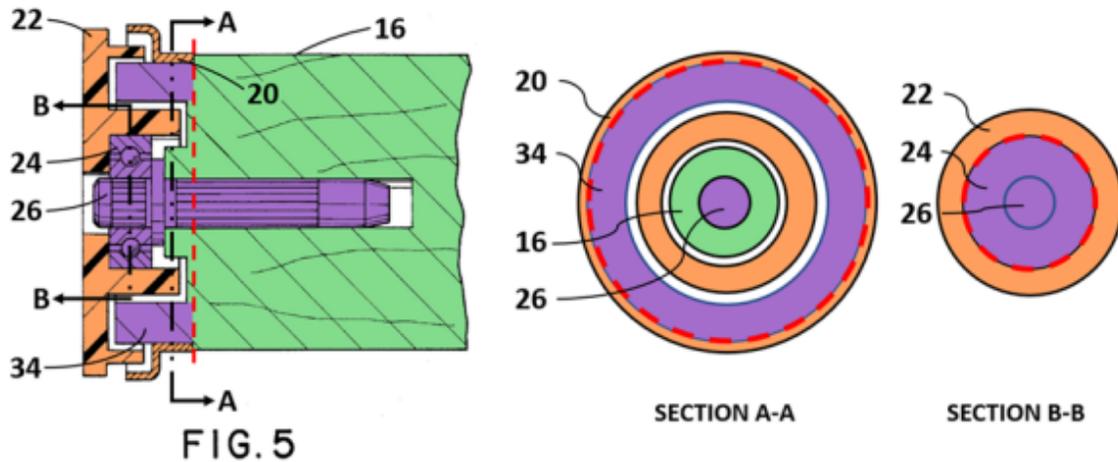
Ex. 1001, 17:46–48. Petitioner relies on *Brundula* for the additional limitation recited in this dependent claim. Pet. 73–74. In support, Petitioner provides annotated Figure 5, reproduced below.

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<sup>18</sup> The only claim other than claim 2 not previously specifically analyzed in this Decision is dependent claim 12. Claim 12 recites:

*The floor cleaner of claim 10, wherein at least a portion of the axial end guard is mountable in an interference fit with one of the end mounting features extending beyond respective axial ends of the outer surface of the core.*

Ex. 1001, 18:40–43. The Petition states, “[t]he additional limitations of claim 12 are substantively identical to those of claim 2. *Brundula* and *Lang* renders obvious this element for the [same] reasons” provided for claim 2. Pet. 86. Despite the similarities between claims 2 and 12 and Petitioner’s reliance on the showing for claim 2 for claim 12, Patent Owner does not specifically discuss claim 12 in the Response. *See generally* PO Resp.



*Id.* at 73. Annotated Figure 5 “shows a cross-sectional or cut-away view of the cylindrical dowel and its cylindrical end units.” *Id.* at 74. With regard to the limitation of claim 2, the Petition states:

*Brundula*’s thread guard 20 is “secured to” the outer periphery of rib 34, and *Brundula*’s end cap 22 is “mounted on” bearing 24 as shown [above] in annotated Figure 5. *Brundula* [Ex. 1013], 3:53-57. A skilled artisan would have understood this to disclose interference fits between thread guard 20 and rib 34 (“Section A-A”), and end cap 22 and the outer race of bearing 24 (“Section B-B”), respectively. Fester [Ex. 1003], ¶ 160. . . . The above illustrations demonstrate the relationship between *Brundula*’s components from an axial view, showing the interference fits (red dashed lines) between (a) rib 34 (purple) and thread guard 20 (orange) (Section A-A), and (b) bearing 24 (purple) and end cap 22 (orange) (Section B-B), as shown above. Fester [Ex. 1003], ¶ 160. A skilled artisan would have understood the above-described “secured” fit between the thread guard and the rib to disclose the claimed “interference fit,” because the ring-shaped thread guard is held in place by the rib 34. Fester [Ex. 1003], ¶ 161. Likewise, a skilled artisan would have understood the above-described “mounted” fit between the end cap and the bearing to disclose the claimed “interference fit,” especially because interference fits were common and well-known for mounting structures to bearings and other assemblies. *Id.*

*Id.* at 73–74. We find Petitioner’s showing with regard to claim 2 to be well-supported and persuasive.

In disputing Petitioner’s showing as to claim 2, Patent Owner first argues that Petitioner relies on inherency to show Brundula discloses an “interference fit.” *See* PO Resp. 36 (“Petitioner effectively equates a ‘secured fit’ and the recited ‘interference fit,’ and in doing so, implicitly argues that a ‘secured fit’ inherently discloses the ‘interference fit.’ Petitioner relies on inherency since it does not raise obviousness on this point.”). Patent Owner then argues that Brundula does not inherently disclose an “interference fit.” *Id.* (“Brundula’s ‘secured fit,’ however, does not inherently disclose the recited ‘interference fit’ since the attachment mechanism between thread guard 20 and rib 34 does not *necessarily* require an interference fit.”).

Petitioner responds that its showing on claim 2 was not based on inherency and, thus, Patent Owner’s argument is not responsive to the Petition’s grounds. Reply 25. The Reply states, “the Petition’s position and Mr. Fester’s supporting testimony were not based on inherency. Instead, they were based on how a skilled artisan would have interpreted the disclosures of Brundula as teaching an interference fit, even though Brundula does not use that exact phrase.” *Id.* (citing *Bradium Techs. LLC v. Iancu*, 923 F.3d 1032, 1049 (Fed. Cir. 2019) (“[A] reference must be considered not only for what it expressly teaches, but also for what it fairly suggests.”) (quoting *In re Baird*, 16 F.3d 380, 383 (Fed. Cir. 1994))).

Patent Owner’s inherency argument is misdirected. Petitioner did not contend that Brundula inherently disclosed an “interference fit” as recited in claim 2. Petitioner argued how the teachings of Brundula would have been

understood by a skilled artisan which may be fairly considered as an argument as to what Brundula teaches or suggests. *See* Pet. 73–74 (quoted above). Accordingly, we do not find this argument to be effective.

With regard to obviousness, Patent Owner argues that “Petitioner’s contentions do not satisfy the legal requirements for establishing obviousness in light of Brundula’s disclosure,” because Petitioner’s assertions are conclusory and unsupported with evidence. PO Resp. 37. We do not agree. As noted above, we find Petitioner’s showing with regard to claim 2 to be well-supported and persuasive.

#### Summary

Although we have focused this analysis on the aspects of Petitioner’s obviousness case disputed by Patent Owner, we have considered the entirety of the record relating to claims 1, 2, 4–12, 14, and 15 in view of (1) Brundula and Lang and (2) Brundula, Lang, and Fahlen. Based on our consideration of all the arguments and evidence presented by the parties, we conclude that Petitioner has met its burden in establishing, by a preponderance of the evidence, that claims 1, 2, 4–12, 14, and 15 are unpatentable as obvious in light of (1) Brundula and Lang and (2) Brundula, Lang, and Fahlen.

### III. CONCLUSION<sup>19</sup>

In light of all the arguments and evidence, we conclude that Petitioner has established that claims 1, 2, 4–12, 14, and 15 of the ’303 patent are unpatentable.

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<sup>19</sup> Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice*

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1, 2, 4–12, 14, and 15 of the '303 patent are unpatentable.

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
1, 4–7, 9–11, 14, 15	102	Lang	1, 4–7, 9–11, 14, 15	
1, 4–7, 9–11, 14, 15	103	Lang, Fahlen	1, 4–7, 9–11, 14, 15	
8	103	Lang, Krier	8	
8	103	Lang, Fahlen, Krier	8	
1, 2, 4–12, 14, 15	103	Brundula, Lang	1, 2, 4–12, 14, 15	
1, 2, 4–12, 14, 15	103	Brundula, Fahlen, Lang	1, 2, 4–12, 14, 15	
<b>Overall Outcome</b>			1, 2, 4–12, 14, 15	

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*Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).*

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