

NOTE: This disposition is nonprecedential.

**United States Court of Appeals  
for the Federal Circuit**

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**IROBOT CORPORATION,**  
*Appellant*

v.

**SHARKNINJA OPERATING LLC, SHARKNINJA  
MANAGEMENT LLC, SHARKNINJA SALES  
COMPANY,**  
*Cross-Appellants*

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2023-1398, 2023-1416

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Appeals from the United States Patent and Trademark  
Office, Patent Trial and Appeal Board in No. IPR2021-  
00544.

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Decided: August 7, 2024

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LAUREN ANN DEGNAN, Fish & Richardson P.C., Wash-  
ington, DC, argued for appellant. Also represented by  
WALTER KARL RENNER, ROSALYND UPTON; OLIVER  
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Before MOORE, *Chief Judge*, LOURIE and STARK, *Circuit Judges*.

LOURIE, *Circuit Judge*.

iRobot Corporation (“iRobot”) appeals from the final written decision of the U.S. Patent and Trademark Office Patent Trial and Appeal Board (“the Board”) holding that claims 1–4, 6–8, 10, 12–15, 18–23, 25, and 26 of U.S. Patent 9,884,423 (“the ’423 patent”) are unpatentable as obvious over the asserted prior art. *SharkNinja Operating LLC v. iRobot Corp.*, No. IPR2021-00544 (P.T.A.B. Nov. 14, 2022), J.A. 1–62 (“*Decision*”). SharkNinja Operating LLC, SharkNinja Management LLC, and SharkNinja Sales Co. (collectively, “SharkNinja”) cross-appeal the decision that claim 9 of the ’423 patent had not been shown to have been obvious. For the following reasons, we *affirm*.

#### BACKGROUND

This appeal pertains to an *inter partes* review (“IPR”) in which SharkNinja challenged claims 1–4, 6–10, 12–15, 18–23, 25, and 26 of the ’423 patent, which recite methods of docking a robotic cleaning device at a base station to charge. For example, claim 1 recites:

1. A method of docking a robotic cleaning device with a base station that includes a plurality of signal emitters including a right signal emitter and a left signal emitter, the method comprising:

directing the robotic cleaning device about a room at a first velocity;

detecting, by a sensor mounted on the robotic cleaning device, a right signal transmitted by the right signal emitter of the base station and

a left signal transmitted by the left signal emitter of the base station;

controlling forward movement of the robotic cleaning device toward the base station at a second velocity less than the first velocity while orienting the robotic cleaning device in relation to the right signal and the left signal;

detecting contact with charging terminals on the base station;

stopping the forward movement of the robotic cleaning device in response to detecting contact with the charging terminals on the base station; and

charging a battery of the robotic cleaning device.

'423 patent, col. 19 ll. 32–52 (emphases added).

SharkNinja raised five grounds of invalidity in its petition. Ground 1 challenged claims 1–4, 6–10, and 12 in view of a U.S. Patent Application Publication (“Jeon”)<sup>1</sup> and a textbook on sensors for mobile robots (“Everett”).<sup>2</sup> Ground 2 challenged the same claims over the same two references in view of an additional U.S. Patent Application (“Abramson”)<sup>3</sup>. Grounds 3 and 4 challenged only claim 9 in view of Jeon, Everett, and another textbook (“Jones”)<sup>4</sup>, with

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<sup>1</sup> U.S. Patent Application Publication 2004/0178767; J.A. 780–90.

<sup>2</sup> H. R. Everett, “Sensors for Mobile Robots: Theory and Application,” ISBN 1-56881-048-2, 1995; J.A. 791–1243.

<sup>3</sup> U.S. Patent Application Publication 2005/0010330; J.A. 1350–78.

<sup>4</sup> J. L. Jones, “Mobile Robots: Inspiration to Implementation,” ISBN 1-56881-097-0, 1998; J.A. 1379–1620.

Ground 4 further adding Abramson to the list of asserted references. Finally, Ground 5 challenged claims 13–15, 18–23, 25, and 26 in view of a U.S. Patent (“Kim”)<sup>5</sup> and Everett. Each of the asserted references describes autonomous cleaning robots with charging base stations.

In its Final Written Decision, the Board found that SharkNinja had established the unpatentability of all challenged claims, except claim 9. Both parties appealed.

We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A) and 35 U.S.C. § 141(c).

#### DISCUSSION

We review the Board’s legal determinations *de novo*, *In re Elsner*, 381 F.3d 1125, 1127 (Fed. Cir. 2004), and the Board’s factual findings for substantial evidence, *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000). A finding is supported by substantial evidence if a reasonable mind might accept the evidence as adequate to support the finding. *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938).

On appeal, iRobot contends that the Board erred in concluding that Jeon and Abramson constituted prior art under 35 U.S.C. § 102(e) after finding that iRobot failed to sufficiently establish and corroborate a prior date of conception. iRobot further contends that the Board erred in reaching its obviousness determination in the context of Ground 5, asserting that the Board impermissibly relied on hindsight in finding a motivation to combine and in reaching its conclusions as to iRobot’s proffered evidence of objective indicia of nonobviousness. On cross-appeal, SharkNinja challenges the Board’s conclusion that it failed to establish the unpatentability of claim 9 by a preponderance of the evidence. We address each argument in turn.

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<sup>5</sup> U.S. Patent 5,440,216; J.A. 1636–66.

## I

iRobot first argues that the Board erred in evaluating whether or not conception had been established prior to the publication of two asserted references: Jeon, which was filed on June 23, 2003, and Abramson, which was filed on July 11, 2003. J.A. 780, Field (22); *id.* at 1350, Field (22). In comparison, the application for the '423 patent was filed on April 19, 2017, with claims of priority back to January 21, 2004.<sup>6</sup> J.A. 63–64, Fields (22) & (60).

To antedate an asserted reference, the patent owner must establish “an earlier conception followed by a diligent reduction to practice.” *Purdue Pharma L.P. v. Boehringer Ingelheim GMBH*, 237 F.3d 1359, 1365 (Fed. Cir. 2001). The burden for establishing prior invention falls squarely on the patent owner. *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1375–76 (Fed. Cir. 2016) (citing *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1379 (Fed. Cir. 2015)).

In addition to providing evidence of conception that encompasses all limitations of the claimed invention, *see Singh v. Brake*, 222 F.3d 1362, 1367 (Fed. Cir. 2000), a patent owner must provide independent corroborating evidence. *Apator Miitor s ApS v. Kamstrup A/S*, 887 F.3d 1293, 1295 (Fed. Cir. 2018) (“It is well established . . . that when a party seeks to prove conception through an inventor’s testimony the party must proffer evidence, ‘in addition to [the inventor’s] own statements and documents,’ corroborating the inventor’s testimony.”) (quoting *Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1577 (Fed. Cir. 1996)). Such corroborating evidence must exist “so that a sound

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<sup>6</sup> Because the effective filing date of the patent at issue is before March 16, 2013, pre-AIA provisions apply. *See Leahy-Smith America Invents Act* (“AIA”), Pub. L. No. 112-29, § 3(n)(1), 125 Stat. 284 (2011).

determination of the credibility of the inventor's story may be reached." *NFC Tech., LLC v. Matal*, 871 F.3d 1367, 1372 (Fed. Cir. 2017) (internal quotation marks omitted); *see also Berges v. Gottstein*, 618 F.2d 771, 776 (CCPA 1980) ("[E]ach corroboration case must be decided on its own facts with a view to deciding whether the evidence as a whole is persuasive.").

The Board held that iRobot failed to establish that the claimed invention was conceived before Jeon and Abramson. *Decision* at 14–21. In particular, the Board held that iRobot's proffered evidence:

d[id] not specifically show conception of detecting contact with the charging terminals or stopping movement of the robot in response to detecting contact with the charging terminals. Moreover, this purported evidence of prior conception fails because it is not corroborated by independent evidence of conception of the relevant elements of the claimed invention.

*Decision* at 20; *see also id.* at 19, 19 n.17 (considering code files and "not find[ing] corroboration"); *id.* at 20 n.18, (addressing a former employee's testimony and holding that it "does not corroborate that the inventors conceived of detecting contact with the charging terminals or stopping movement of the robot in response to detecting contact with the charging terminals prior to June 23, 2003).

The Board thus concluded that Jeon and Abramson are prior art to the '423 patent under pre-AIA 35 U.S.C. § 102(e), which, in pertinent part, provides that a "person shall be entitled to a patent unless . . . the invention was described in . . . an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent."

Conception is a question of law predicated on subsidiary factual findings, one of which is the sufficiency of

corroboration. *REG Synthetic Fuels, LLC v. Neste Oil Oyj*, 841 F.3d 954, 958 (Fed. Cir. 2016). As indicated above, the Board found a lack of proof of conception before Jeon and Abramson. iRobot argues that the Board erred in reaching that conclusion, but we need not address conception because the issue regarding the applicability of Jeon and Abramson can be resolved by looking only to corroboration.

iRobot contends that we should review the Board's analysis on corroboration *de novo*, asserting that the Board legally erred by requiring that the evidence “recite ‘magic words’ corresponding to the words used in the claims.” Appellant's Br. at 3. We disagree with that characterization. The Board did not require that the proffered evidence recite claim language. Rather, it correctly required the independent evidence to corroborate that the claimed invention, which included a method comprising the robotic cleaning device making contact with charging terminals on the base station and subsequently stopping movement upon detecting contact with said charging terminals, had been conceived prior to June 23, 2003. The Board concluded that it did not, and that finding was supported by substantial evidence.

In particular, iRobot attempted to rely upon a “user.tl” source code file to corroborate that the inventors had conceived of a robotic cleaning device that could detect contact with the charging terminals, and subsequently stop movement in response to that detection, as claimed. The source code file provides a “charger-available?” macro, but no additional detail to corroborate that electrical contacts were being made or detected. *See* J.A. 6735. Similarly, although the source code includes a subsequent “stop-all” macro, no additional detail is provided to establish if that command pertains specifically to stopping movement of the robotic cleaning device in response to detecting contact with charging terminals. *See id.* Expert testimony submitted by iRobot did not further clarify the matter, as it stated only that the “charger-available?” condition “outputs an indicator” if

the robotic cleaning device is “electrically connected” to the charger. J.A. 6648.

iRobot also cited a Design Strategies document as corroborating conception of having the robot detect and respond to contact with charging terminals, but that document describes only how a “logic input” indicates “when the external charger is available (that is, when good contact has been made).” J.A. 6765. It further indicates that docking at the charger “depends on the mechanical configuration of the charger,” which suggests that the Design Strategies document applied to more than one charging configuration. *Id.* And, as the Board correctly noted, the document’s reference to making “good contact” is insufficient to corroborate conception in view of the ’423 patent’s disclosure of detecting contact via depression of the robot’s bumper, rather than by an electrical contact. *Decision* at 18–19; ’423 patent, col. 15 ll. 13–24.

To be clear, the proffered evidence need not recite the specific claim language to corroborate conception, but it must nevertheless be specific enough to evidence conception of the claimed electrical contacts, rather than contact via bumper depression. As the Board correctly identified, such language is absent from that document. *See Decision* at 18 (“[T]here is no specific reference to the charging terminals of the base station. . . . And there is no reference in [the Design Strategies document] to stopping the robot in response to detecting contact with the charging terminals of the base station or otherwise.”). That the documents could also theoretically have been interpreted to describe electrical contacts is insufficient to overturn the Board’s factual finding on corroboration. *Velandier v. Garner*, 348 F.3d 1359, 1378–79 (Fed. Cir. 2003) (“If the evidence will support several reasonable but contradictory conclusions, we will not find the Board’s decision unsupported by substantial evidence simply because the Board chose one conclusion over another plausible alternative.”).



iRobot also generally cited a former employee's declaration as independent evidence corroborating conception. J.A. 294 (Patent Owner Response, broadly asserting that a declaration by a former employee "corroborates the testimony of the inventors' conception"), 7505-12 (former employee declaration). But the Board found that that also failed to sufficiently corroborate conception. *Decision* at 17 n.16. In particular, as explained by the Board:

In addition to the evidence cited by Patent Owner in the section of the Response relating to conception (*see* Resp. 12), Patent Owner contends that the Declaration of Scott Miller (Ex. 2067), a former employee, "corroborates the testimony of the inventor's conception" (*see* Resp. 3). Patent Owner does not expound on or explain this contention. Nonetheless, we considered the testimony of Mr. Miller in Exhibit 2067. Exhibit 2067 does not corroborate that the inventors conceived of detecting contact with the charging terminals or stopping movement of the robot in response to detecting contact with the charging terminals prior to June 23, 2003.

*Id.* at 20 n.18.

iRobot asserts that "Miller's un rebutted, disinterested testimony" corroborates "detecting' and monitoring electrical contact between the robot and the base station—exactly as claimed." Appellant's Br. at 47. But, as the Board correctly noted, that testimony does not describe the claimed charging terminals. It therefore cannot, on its own, sufficiently corroborate their alleged conception date. The former employee's testimony further cites a Technical Specifications document as purported corroborating evidence of conception, but, as the Board correctly found, that document similarly contains no reference to the charging terminals of the base station, detecting the charging terminals, or stopping the robot in response to detecting contact with the charging terminals of the base station. *Decision* at

17 n.16. It therefore also fails to corroborate earlier conception of those claim elements.

The remaining cited paragraphs of iRobot's technical expert's declaration are insufficient to fill the gaps in iRobot's corroborative evidence. Indeed, other than reciting the relevant claim elements and quoting the `user.tl` source code file and Design Strategies document, the expert declaration offers only two conclusory sentences: that "[t]he iRobot documents and source code files provide these elements," J.A. 6648, ¶ 55, and that the Design Strategies document "indicates that the Roomba would stop its forward movement to dock at the charger when it detects contact with the charging terminals on the base station," J.A. 6648, ¶ 57. Such testimony, without more, is only conclusory with inadequate supporting evidence. It was appropriate, therefore, for the Board to accord it little or no weight. 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."). In particular, the expert declaration never provided a supported explanation for what a person of ordinary skill in the art would have understood the "charger-available?" macro to mean.

Instead, the record provides evidence that (1) the inventors had not yet coded a charger that utilized the claimed charging contacts, J.A. 4919–20 at 122:22–123:5; (2) the inventors could not testify to the meaning of the "charger-available?" function without additional supporting evidence to provide "context," J.A. 5135–36 at 115:3–116:3; and (3) as admitted by iRobot's counsel at oral argument before the Board, such context was never provided to iRobot's technical expert or to SharkNinja, J.A. 481 ("I'm not sure that that code existed or where it was located, or you know, where it was from. But it wasn't – we didn't have detailed code from 19 years ago on that one specific feature.").

In view of the above, we find that the Board's determination that the proffered evidence is insufficient to corroborate earlier conception was supported by substantial evidence. We therefore affirm the Board's ultimate determination that iRobot did not successfully swear behind Jeon and Abramson and that therefore those references were available as prior art to assert against the '423 patent.

## II

iRobot next asserts that the Board legally erred in finding a motivation to combine two prior art references asserted in SharkNinja's fifth asserted ground of obviousness, as well as in evaluating iRobot's proffered evidence of objective indicia of nonobviousness. We address each argument in turn.

### A

iRobot first argues that the Board erred in finding a motivation to combine Kim and Everett when evaluating the obviousness of claims 13–15, 18–23, 25, and 26. According to iRobot, the Board's motivation analysis was erroneously cursory, improperly concluding that a person of ordinary skill in the art would have been motivated to combine the two references simply because of their similarities. iRobot further contends that the Board erred by limiting its own analysis on the matter to a single sentence declaring that "Petitioner's reasoning is sound." *See Decision* at 56. We disagree.

The Board first identified that "motivation to combine is the only disputed issue as to the challenge" to claims 13–15, 18–23, 25, and 26 in view of Kim and Everett, and thus it elected to "take up that issue first." *Id.* at 54. The Board next identified how Kim teaches each and every claim limitation except one pertaining to a "second velocity," which is taught by Everett. *Id.* at 55. The Board thus only had to address whether or not a person of ordinary skill in the art would have been motivated to combine

Everett's teachings of a second velocity with Kim's robotic cleaning device. Its subsequent analysis considering and weighing the arguments raised by SharkNinja and iRobot on the matter spanned several pages. *Id.* at 55–57.

As explained by the Board, SharkNinja first proposed that a skilled artisan would have had a motivation to combine Kim and Everett given the similarities between the two references' teachings. *Decision* at 55. iRobot countered that the devices taught in the asserted references "have significant differences in size, weight, configuration, and operation." *Id.* The Board agreed with SharkNinja that iRobot's arguments were "not supported, speculative, and incorrect," as well as "a legally insufficient bodily incorporation argument." *Id.* at 56 (citing *Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016)).

The Board also considered SharkNinja's argument that a "skilled artisan would have been motivated to reduce base station approach velocity as taught by Everett in [Kim's robot to achieve a predictable, desired result (avoiding collision and/or increased robot maneuverability for accurate alignment with the base station)," finding that rationale "sound." *Decision* at 55–56.

The Board additionally assessed SharkNinja's argument that a person of ordinary skill in the art would have been motivated to combine Kim with Everett in view of the magnet system that Kim disclosed for aligning the robotic cleaning device on the base station. In particular, the Board credited SharkNinja's argument that such a magnet-based system would "not prevent misalignment of a robot, traveling at a higher velocity, with its charging station." *Id.* at 56. It then concluded that "the system disclosed in Kim would benefit from the robot approaching the base station to recharge at a lesser velocity than its cleaning velocity." *Id.* The Board's analysis was thus not impermissibly cursory as iRobot contends.

The Board also does not appear to have impermissibly relied on hindsight in finding a motivation to combine. Rather, it simply accepted SharkNinja’s argument that a person of ordinary skill in the art would have recognized that reducing velocity upon an attempt to dock, as taught by Everett, would beneficially reduce the momentum of Kim’s robot to promote better alignment at the charging base station. The Final Written Decision thus properly “reflects that the Board considered [the patent owner’s] arguments regarding motivation to combine, weighed them against the competing evidence and argument, and concluded that despite [the patent owner’s] contentions, one of skill in the art would have been motivated to combine” the asserted prior art. *Novartis AG v. Torrent Pharms. Ltd.*, 853 F.3d 1316, 1327 (Fed. Cir. 2017).

We thus see no error in the way in which the Board addressed or weighed the evidence of record in assessing motivation to combine and find its conclusions to be supported by substantial evidence. We therefore affirm the Board’s determination that SharkNinja established by a preponderance of the evidence that a person would have had a motivation to combine Kim with Everett, rendering claims 13–15, 18–23, 25, and 26 obvious.

## B

iRobot next argues that the Board’s determinations regarding objective indicia of nonobviousness were also infected by hindsight and contrary to this court’s precedent. We disagree. Although the Board was quite particular in its analysis, it correctly required sufficiently detailed evidence to support a nexus between evidence of nonobviousness and the claims. Indeed, as the Board noted, much of iRobot’s evidence of nonobviousness referred to a broad array of Roomba devices and was not limited to ones that are specifically pertinent to the claims at issue. *Decision* at 27–34.

A patent owner is entitled to a presumption of nexus when it shows that the asserted objective evidence is tied to a specific product that “embodies the claimed features, and is coextensive with them.” *Brown & Williamson Tobacco Corp. v. Philip Morris, Inc.*, 229 F.3d 1120, 1130 (Fed. Cir. 2000). The “existence of and weight assigned to any objective indicia of nonobviousness” is an “underlying factual question[.]” *Adapt Pharma Operations Ltd. v. Teva Pharms. USA, Inc.*, 25 F.4th 1354, 1364 (Fed. Cir. 2022); see also *Bosch Auto. Serv. Sols., LLC v. Matal*, 878 F.3d 1027, 1036–38 (Fed. Cir. 2017) (“[W]hether the requisite nexus exists is a question of fact.” (citation omitted)).

We agree with the Board that iRobot failed to provide sufficient support that any of its products embodied any of the challenged claims. See *Decision* at 27 (“Patent Owner has not shown any commercial product is within the scope of the challenged claims”). Indeed, iRobot asserts that it offered evidence relating to its Roomba 900 series which was alleged to “embody at least claims 13 and 21 of the ’423 patent,” Appellant’s Br. at 65, but admits that it did not submit evidence establishing that the Roomba 900 series products approach the docking station at a “second velocity less than the first velocity before completing a cleaning task in the room and in response to detecting a need to charge the energy storage unit” as required by the claims. ’423 patent, col. 20 ll. 47–50; see Appellant’s Br. at 66–67 (“iRobot had specifically pointed to the CES video as showing the robot slowing down as it approached” the base station, but “in the video, the return to the base station was initiated by the demonstrator using a mobile phone application,” rather than by detecting a need to charge.).

Moreover, iRobot never provided an analysis to establish coextensiveness, and therefore could not have established a presumption of nexus for its products. *Decision* at 28 (“Patent Owner does not provide an analysis demonstrating that its evidence or products are coextensive (or nearly coextensive) with the challenged claims.”).

Nevertheless, a patent owner is further “afforded an opportunity to prove nexus by showing that the evidence of secondary considerations is the ‘direct result of the unique characteristics of the claimed invention.’” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373–74 (Fed. Cir. 2019) (quoting *In re Huang*, 100 F.3d 135, 140 (Fed. Cir. 1996)). But iRobot failed to establish that the proffered evidence of secondary considerations was the direct result of any unique characteristics of the claims. Instead, as the Board found, the evidence proffered by iRobot “is of broad scope relating to Roomba and not shown to be related to the claimed invention.” *Decision* at 33. iRobot did allege recognition, praise, and copying in view of an “auto charge and resume functionality,” see J.A. 349–53, but it rested its arguments only on the patent’s independent claims, which do not recite such a feature, and iRobot failed to argue that any other subset of claims was separately patentable. See J.A. 341–42; *Decision* at 33–34 (quoting SharkNinja’s analysis that “claim 1 recites no such functionality and claims 13 and 21 recite only auto-charging, not resuming”); see also, e.g., *Rambus Inc. v. Rea*, 731 F.3d 1248, 1257 (Fed. Cir. 2013) (holding that there is no nexus unless the evidence presented is “reasonably commensurate with the scope of the claims” (quoting *In re Huai-Hung Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011))). Accordingly, we find that the Board’s conclusion that iRobot did not establish a nexus between its products and the claims was supported by substantial evidence.

We therefore affirm the Board’s determination that iRobot did not establish sufficient objective indicia of non-obviousness to overcome SharkNinja’s prima facie case.

### III

On cross-appeal, SharkNinja argues that the Board erred in holding that it failed to establish the obviousness of claim 9 by a preponderance of the evidence.

SharkNinja challenged the patentability of claim 9 in four of its five asserted grounds. In its first ground, SharkNinja asserted obviousness in view of Jeon and Everett, but the Board held that that combination failed to teach certain elements of claim 1—a determination that SharkNinja did not challenge on appeal. In its second ground, SharkNinja asserted Jeon and Everett in further view of Abramson. Its third and fourth grounds (collectively, the “Jones grounds”) repeated the challenges of Grounds 1 and 2 further in view of the Jones reference. *See Decision* at 52.

Claim 9 depends from claim 1 and recites that the method further comprises “avoiding, by the robotic cleaning device, the right signal and the left signal while an energy level of the battery of the robotic cleaning device remains above a predetermined energy level.” ’423 patent, col. 20 ll. 20–24.

SharkNinja argues that the Board erred in considering the second ground by incorrectly reading embodiments into the claim, yielding a too-narrow construction for the term “avoiding.” It further contends that the Board’s determinations that the claims had not been shown to have been obvious by the Jones grounds were unsupported by substantial evidence. We address each argument in turn.

#### A

SharkNinja’s first argument hinges on claim construction. Although the parties disputed what “avoiding” in the context of claim 9 meant, neither argued for a formal construction. *Decision* at 53. The Board held that “avoiding” required “more than not attempting to detect the signals” after consulting the ’423 patent specification, which consistently describes “avoidance” features as involving the robotic cleaning device actively keeping away from the base station’s signals. *Id.* We review claim construction based on the intrinsic record *de novo*. *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 331 (2015).



We begin by looking to the language of the claim itself. *Allergan Sales, LLC v. Sandoz, Inc.*, 935 F.3d 1370, 1374 (Fed. Cir. 2019). Claim 9 depends from claim 1 and recites that the method comprises “avoiding, by the robotic cleaning device, the right signal and the left signal while an energy level of the battery of the robotic cleaning device remains above a predetermined energy level.” ’423 patent, col. 20 ll. 20–24. Some understanding of the meaning of claim 9 can be gleaned from claim 1, which first introduces said right and left signals.

Claim 1 describes two different types of interplay between the robotic cleaning device and those signals. The claim first requires that the device *detects* the signals. ’423 patent, col. 19 ll. 38–41 (“detecting, by a sensor mounted on the robotic cleaning device, a right signal transmitted by the right signal emitter of the base station and a left signal transmitted by the left signal emitter of the base station”). Thereafter, claim 1 describes physical *movement* of the device in relation to the signals. *Id.* col. 19 ll. 42–46 (“controlling forward movement of the robotic cleaning device toward the base station . . . while orienting the robotic cleaning device in relation to the right signal and the left signal”). Such orientating allows the device to dock onto the base station such that the final step in the claimed method, “charging a battery of the robotic cleaning device,” can be achieved. *Id.* col. 19 l. 52. But ultimately, claim 1 does not provide much clarity as to whether *avoidance* of those signals, as recited in claim 9, requires an active movement component or if mere avoidance of detection suffices.

Additional context for understanding the scope of claim 9 may be gleaned from claim 3, which also depends directly from claim 1, and recites “seeking, by the robotic cleaning device, the right signal and the left signal when the energy level of the battery is less than a predetermined energy level.” *Id.* col. 19 ll. 61–65 (emphasis added). Claim 3, with its seeking behavior at a lower battery level, thus appears

as somewhat of a counterpart to claim 9, with its avoiding behavior at a higher battery level. Claim 6, which depends from claim 3, further recites “altering a movement characteristic of the robotic cleaning device in seeking the right signal and the left signal.” *Id.* col. 20 ll. 6–8 (emphasis added). There is no claim 6 counterpart that depends from claim 9, however. Thus, whether claim 9 requires something more than not detecting the signal, such as by, *e.g.*, altering a movement characteristic in avoiding the right and left signal requires us to consult the rest of the intrinsic record, focusing on the patent’s specification, as the parties have not pointed to anything in the prosecution history that could meaningfully impact our analysis. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005) (noting that the specification is “highly relevant to the claim construction analysis” and the “single best guide to the meaning of a disputed term” (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996))).

The specification clarifies the matter. For example, it confirms that the “seek” behavior of claim 3 and the “avoid” behavior of claim 9 are not perfectly parallel counterparts. That is—the “seek” behavior is one that may be engaged “passively” as well as “actively,” depending on the battery level and state of operation of the robotic cleaning device. *See, e.g.*, ’423 patent, FIG. 7. The patent does not describe a passive version of avoidance, however. Instead, as the Board correctly noted, avoidance behaviors are consistently described as active ones, requiring a movement component. *See Decision* at 53 (citing ’423 patent, col. 2 ll. 52–57 (describing that, “when the quantity of energy stored [in the robot’s battery] exceeds the high energy level,” the robot performs a “task including movement of the robotic device away from the base station in response to reception, by the signal detector, of a base station avoidance signal”), col. 3 l. 65–col. 4 l. 1 (describing how “the first signal emitter transmits an avoidance signal, thereby restricting a movement of the robotic device to directions away from the base

station, [while] the second signal emitter transmits a homing signal, thereby directing a movement of the robotic device to the base station”), col. 6 ll. 17–22 (describing how “an avoidance signal” is generated “in a diffuse region near the base station **10** to prevent generally the robot from coming into inadvertent direct contact with the base station **10** while performing a task, such as vacuuming”), col. 11 l. 62–col. 12 l. 21 (similar)).

SharkNinja protests that such an analysis impermissibly reads embodiments into the claims while also ignoring the plain claim language that recites that the robotic cleaning device avoid the right and left signals, rather than the base station. That is not correct. The examples above serve only to demonstrate that the patent consistently describes avoidance as an active behavior that alters the movement of the robotic cleaning device. Although some of those examples involve actively moving away from the base station, the patent specification also describes actively avoiding signals generated therefrom. For example, the patent provides:

If an avoidance signal **60** is detected, the robot **40** chooses a turning direction **120**. The robot **40** then begins to turn in the chosen direction until the avoidance signal **60** is no longer detected **130**. Once the avoidance signal **60** is no longer detected, the robot **40** continues turning for an additional amount **140** such as 20°, or the robot may turn randomly between 0° and 135°.

’423 patent, col. 13 ll. 17–26 (emphasis added); *see also id.* at FIG. 6A.

Such active avoidance behaviors are otherwise also in accordance with the general tenor of the ’423 patent disclosure. For example, starting in the abstract, the ’423 patent describes “systems for emitting avoidance signals to prevent inadvertent contact between the robot and the base station.” ’423 patent, Abstract; *see also id.* col. 2 ll. 21–34

(describing prior art systems that did not actively prevent inadvertent collisions between the robotic cleaning device and the base station). Merely ignoring a homing signal, as SharkNinja proposes claim 9 allows for, would not meet that goal, as the robotic cleaning device may still otherwise experience inadvertent contact with the base station. Indeed, nowhere in the patent is the robotic cleaning device described as merely avoiding *detection* of the signals without additionally altering its movement. Rather, consistently throughout the specification, the device first purposefully detects the signals and then either actively “avoid[s] the] base,” where the signals are generated, *see, e.g., id.* at FIG. 7, or otherwise actively alters its path first so that it can subsequently avoid signal detection following that act of relocation. *Id.* col. 13 ll. 17–26, FIG. 6A.

The specification thus confirms that a reader would understand “avoiding” to require something more than merely not attempting to detect the signals. *See Phillips*, 415 F.3d at 1316 (“The construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.”) (quoting *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998)).

In appealing the Board’s determination that SharkNinja failed to establish by a preponderance of the evidence that Jeon, Everett, and Abramson render claim 9 obvious, SharkNinja contested only the Board’s construction of the term “avoiding.” Because we agree with the Board’s construction, we affirm its ultimate conclusion that claim 9 had not been shown to have been obvious.

## B

SharkNinja finally asserts that, even if the Board’s construction stands, its holdings that claim 9 was not shown to have been obvious in view of the Jones grounds were unsupported by substantial evidence.

In particular, SharkNinja seems to assert that the Board erred by ignoring how the petition presented the teachings of Jones in the context of its asserted obviousness grounds. Notably, there is no dispute that Jones does not teach the avoiding step recited in claim 9. Rather, Jones teaches a different “avoid” feature in which the robotic cleaning device avoids being distracted by IR signals that have reflected off objects in the cleaning field. In its petition, SharkNinja asserted that a person of ordinary skill in the art would have incorporated a variant of that feature into the device taught by Jeon such that the modified device avoided signals emitted directly from the base station.

The Board aptly summarized SharkNinja’s argument, quoting its assertion that such a combination would have been capable of “achiev[ing] a predictable result” while further “conserv[ing] energy, sav[ing] time, and avoid[ing] accidental collisions with the base station.” *Decision* at 54. But the Board found that those arguments did not establish a prima facie case of obviousness because they were “too general and conclusory.” *Id.* The Board further noted that even if a person of ordinary skill in the art were to incorporate Jones’s avoid feature into Jeon, the references themselves still did not teach the element of avoiding signals emitted from the base station.

SharkNinja nevertheless appears to assert that, using common sense and routine skill, one of ordinary skill in the art would have had some non-negligible motivation to reconfigure Jones’s avoid feature to yield something that could read on claim 9. The Board was correct to reject such an argument. Although such “common sense” [arguments] can be invoked, even potentially to supply a limitation missing from the prior art, [they] must still be supported by evidence and a reasoned explanation.” *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1363 (Fed. Cir. 2016). We see no error in the Board concluding that what SharkNinja presented was insufficient to establish a prima facie case of obviousness against claim 9 and find its factual findings

on the matter to be supported by substantial evidence.

Accordingly, we affirm the Board's determination that SharkNinja failed to establish by a preponderance of the evidence that the asserted combinations of Jeon, Everett, Abramson, and Jones render claim 9 obvious.

#### CONCLUSION

We have considered the parties' remaining arguments and do not find them persuasive. For the foregoing reasons, we *affirm* the Board's determination in IPR2021-00544 that claims 1-4, 6-8, 10, 12-15, 18-23, 25, and 26 of U.S. Patent 9,884,423 are unpatentable, as well as its conclusion that SharkNinja did not establish the unpatentability of claim 9 by the requisite preponderance of the evidence.

#### **AFFIRMED**

#### COSTS

No costs.