

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

v.

IROBOT CORPORATION,
Patent Owner.

PGR2021-00065
Patent 10,813,517 B2

Before BARRY L. GROSSMAN, TERRENCE W. McMILLIN, and
JASON W. MELVIN, *Administrative Patent Judges*.

McMILLIN, *Administrative Patent Judge*.

DECISION
Denying Institution of Post-Grant Review
35 U.S.C. § 324

I. INTRODUCTION

SharkNinja Operating LLC, SharkNinja Management LLC, and SharkNinja Sales Company (“Petitioner”)¹ filed a Petition to institute a post-grant review of claims 1–22 (the “challenged claims”) of U.S. Patent 10,813,517 B2 (Ex. 1001, the “’517 patent”) pursuant to 35 U.S.C. § 311 *et seq.* Paper 1 (“Petition” or “Pet.”). iRobot Corporation (“Patent Owner”)² filed a Preliminary Response. Paper 6 (“Preliminary Response” or “Prelim. Resp.”). Petitioner filed a Pre-Institution Reply. Paper 8 (“Reply”). Patent Owner filed a Pre-Institution Sur-reply. Paper 10 (“Sur-reply”). After considering the Petition, the Preliminary Response, Reply, and Sur-reply and the evidence of record, we deny institution of post-grant review under 35 U.S.C. § 324(a), because the information presented in the Petition does not establish that the challenged claims are eligible for post-grant review and does not demonstrate that it is more likely than not that at least 1 of the claims challenged in the Petition is unpatentable.

A. *Related Proceedings*

The parties identify the following related proceedings:

In the Matter of Certain Robotic Floor Cleaning Devices and Components Thereof, Inv. No. 337-TA-1252³ (US International Trade Commission) (the “ITC investigation”); and

¹ Petitioner identifies SharkNinja Operating LLC, SharkNinja Management LLC, and SharkNinja Sales Company as the real parties-in-interest. Pet. 80.

² Patent Owner identifies iRobot Corporation as the real party-in-interest. Paper 4, 2.

³ Petitioner refers to this as 337-TA-3530, but the ITC website indicates 3530 is the docket number, not the investigation number. *See* <https://pubapps2.usitc.gov/337external/3979>.

iRobot Corp. v. SharkNinja Operating LLC, Case No. 1:21-cv-10155 (D. Mass.). Pet. 64; Paper 4, 2.

We note these eleven additional proceedings between the parties which are pending before the Board appear to involve related technology: IPR2020-00733, IPR2020-00734, IPR2020-00735, IPR2020-00863, IPR2020-1639, IPR2020-001640, IPR2021-00544, IPR2021-00545, PGR2021-00065, PGR2021-00066, and PGR2021-00079.

B. The '517 Patent

The '517 patent is titled “Navigational Control System for a Robotic Device.” Ex. 1001, code (54). The patent describes that autonomous robotic devices utilize one of three schemes for navigation: deterministic (where the autonomous robotic device follows a defined path), pseudo-deterministic (using schemes such as “dead reckoning”), and random. *Id.* at 1:63–2:52.

In deterministic cleaning, the patent explains, “the autonomous robotic device follows a defined path, e.g., a boustrophedon path that is calculated to facilitate complete cleaning coverage of a given area while eliminating redundant cleaning.” *Id.* at 2:1–6. But, “[d]eterministic cleaning requires that the robotic device maintain precise position knowledge at all times, as well as its position history (where it has been), which, in turn, requires a sophisticated positioning system.” *Id.* at 2:7–10. However, deterministic devices are very expensive. *Id.* at 2:10–44.

In contrast, “[d]ead reckoning consists of continually measuring the precise rotation of each drive wheel (e.g., using optical shaft encoders) to continually calculate the current position of the robotic device, based upon a known starting point and orientation.” *Id.* at 2:48–52. But, “dead reckoning

robotic devices are generally considered unreliable for cleaning operations of any great duration.” *Id.* at 2:57–59.

The patent explains that “while a random motion robotic device is a relatively inexpensive means of cleaning a defined working area as contrasted to a deterministic robotic device, the random-motion robotic device requires a significantly higher cleaning time.” *Id.* at 3:21–25. Therefore, a “need exists to provide a deterministic component to a random-motion robotic device to enhance the cleaning efficiency thereof to reduce the running time for the random-motion robotic cleaning to achieve a 98% cleaning coverage.” *Id.* at 3:26–30.

To address this, the patent’s approach uses “a debris sensor, and apparatus utilizing such a debris sensor, wherein the sensor is instantaneously responsive to debris strikes, and can be used to control, select or vary the operational mode of an autonomous or non-autonomous cleaning apparatus.” *Id.* at 3:34–38. The ’517 patent states:

The sensor system includes a debris sensor for generating a debris signal, a bump sensor for generating a bump signal, and an obstacle following sensor disposed on a side of the autonomous cleaning apparatus for generating an obstacle signal. The processor executes a prioritized arbitration scheme to identify and implement one or more dominant behavioral modes based upon at least one signal received from the sensor system.

Id. at 3:48–55. To increase cleaning efficiency, the cleaning device adds “a deterministic component (in the form of a control signal that remotely controls the movement of the robotic device 100) to the motion algorithms.” *Id.* at 21:34–41. “The navigation control algorithm includes a definition of a predetermined triggering event,” which “is a specific occurrence or condition in the movement activity of the robotic device 100.” *Id.* at 21:44–

64. With regard to the “navigation control algorithm,” the ’517 patent states:

The terminology “navigation control algorithm” as used herein encompasses a set of instructions that: (a) define how the position history or instantaneous position is used by the navigational control system 10 (e.g., counting and comparing cells visited, a true-false determination for cells visited, true-false determination whether the predetermined triggering event has occurred); (b) defines the triggering event or events associated with the use of the position history or the instantaneous position; and (c) identifies the control signal(s) to be implemented when the triggering event is realized.

Id. at 27:32–41.

In one embodiment, in the navigation control algorithm, one or more cells in the stored grid map are pre-identified (i.e., prior to operating the robotic device 100) as “hot spots” in the defined working area. As the robotic device 100 visits any particular cell C, the microprocessor 24 is operative to determine whether the visited cell has been identified as a “hot spot” (true-false determination). If the microprocessor 24 determines that the visited cell C is a “hot spot” (triggering event), the microprocessor 24 is operative to cause a control signal to be communicated to the robotic device 100 . . . [which] causes the robotic device 100 to implement the prescribed conduct specified by the control signal, e.g., one or more of the basic maneuvers described above and/or a Spot Coverage pattern or Obstacle-Following behavioral mode as described above.

Id. at 27:61–28:11.

C. Challenged Claims

Petitioner challenges claims 1–22 (all) of the ’517 patent. Pet. 1.

Claim 1 is reproduced below.

1. An autonomous cleaning apparatus comprising:
a cleaning head;

- a drive system operable to move the cleaning apparatus along a surface of a working environment while the cleaning head cleans the surface; and
- a receiving system configured to
 - prior to initiation of a cleaning mission of the cleaning apparatus, store a map of at least a portion of the working environment based on previously determined positions of the cleaning apparatus and autonomously identify a hot spot in the map based on the previously determined positions of the cleaning apparatus,
 - determine, during the cleaning mission, a position of the cleaning apparatus in the working environment, and
 - cause the cleaning apparatus, during the cleaning mission, to initiate a spot coverage cleaning behavior of the cleaning apparatus in response to the determined position of the cleaning apparatus corresponding to the hot spot in the stored map.

Ex. 1001, 34:37–57.

D. The Asserted Grounds

Petitioner challenges claims 1–22 (all) of the ’517 patent based on the grounds set forth in the table below.

Claim(s) Challenged	35 U.S.C. §	Basis
1–22	112(a)	Written description
1–22	112(a)	Enablement

Pet. 4. Petitioner also relies on the Declaration of Dr. Noah Cowan (Ex. 1003, “Cowan Decl.”), which provides evidence in support of the contentions in the Petition. Patent Owner has not submitted a declaration or other testimonial evidence of an expert. *See generally* Prelim. Resp.

Both the written description and enablement challenges relate to the “autonomously identify” limitations in independent claim 1 (“autonomously identify a hot spot”) and independent claims 4 and 15 (“autonomously identify a predefined zone”). *See, e.g.*, Pet. 2 (“the specification does not

provide written description support for or enable these added ‘autonomously identify’ limitations—namely, it never describes a receiving system configured to autonomously identify a hot spot or predefined zone in a map prior to initiation of a cleaning mission.”). As set forth below, we determine that the Specification of the ’517 patent (and predecessor applications) adequately support the “autonomously identify” limitations and the challenges fail.

II. ANALYSIS

A. *Claim Construction*

Petitioner asserts “that no terms need to be construed for the purpose of deciding the issues presented.” Pet. 17. Patent Owner does not argue to the contrary. *See generally* Prelim. Resp. The parties, however, dispute how certain terms should be understood. Below, in the context of the parties’ arguments, we address our interpretation of “prior to initiation of a cleaning mission of the cleaning apparatus” and “autonomously identify” as recited in independent claims 1, 4, and 15. Ex. 1001, 34:43–49, 35:22–28, 36:29–35. We determine that no other terms require construction for purposes of this decision whether to institute post-grant review. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Matal*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe terms ‘that are in controversy, and only 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)).

As noted above, the written description and enablement challenges relate to the “autonomously identify” limitations in independent claim 1 (“autonomously identify a hot spot”) and independent claims 4 and 15

(“autonomously identify a predefined zone”). *See generally* Pet. Petitioner does not contend that these limitations or any of the challenged claims are indefinite or fail to inform with reasonable certainty, those skilled in the art about the scope of the claims.⁴

B. Level of Ordinary Skill in the Art

With regard to the level of ordinary skill in the art, the Petitioner contends:

A skilled artisan would have had at least a four-year degree in mechanical engineering or electrical engineering or a closely related field and at least one year of experience in the design and implementation of robotics and embedded systems. Cowan [Ex. 1003], ¶¶ 17-19. Additional education could substitute for professional experience and vice versa.

Pet. 16. Patent Owner does not directly address the level of ordinary skill in the art. *See generally* Prelim. Resp.

We determine that Petitioner’s proposed level of ordinary skill in the art is reasonable and, as noted, it is not disputed by Patent Owner. For purposes of evaluating whether the Specification of the ’517 patent (and predecessor applications) adequately support the “autonomously identify” limitations, we apply Petitioner’s proposed level of ordinary skill in the art.

⁴ “The Patent Act requires that a patent specification ‘conclude with one or more claims *particularly pointing out and distinctly claiming* the subject matter which the applicant regards as [the] invention.’” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014) (emphasis and alteration in original) (quoting 35 U.S.C. § 112, para. 2).⁴ Patent claims are indefinite if they “fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Id.* at 898–899.

C. Petitioner's Unpatentability Challenges

1. Summary of Arguments

Petitioner challenges all the claims of the '517 patent as failing to provide a written description of and enable the “autonomously identify” limitations. *See generally* Pet. Petitioner argues:

The '517 patent issued because during prosecution [Patent Owner] added a claim limitation to all of the independent claims—a receiving system configured to “autonomously identify” a “hot spot” or “predefined zone” in a map—to overcome the prior art. But the '517 patent's specification does not provide written description support for or enable this added claim limitation, rendering the claims invalid under § 112(a).

Id. at 1. In response, Patent Owner argues, “Petitioner has failed to demonstrate that *it is more likely than not that* at least one of the '517 patent claims is unpatentable under 35 U.S.C. § 112.” Prelim. Resp. 3. We agree with Patent Owner and deny institution on this basis.

Petitioner's challenges focus on the following language in independent claims 1, 4, and 15 of the '517 patent (*see* Pet. 20–21):

“a receiving system configured to prior to initiation of a cleaning mission of the cleaning apparatus . . . autonomously identify a hot spot in the map based on the previously determined positions of the cleaning apparatus” Ex. 1001, 34:42–49 (claim 1).

“a receiving system configured to prior to initiation of a cleaning mission of the cleaning apparatus . . . autonomously identify a predefined zone in the map based on the previously determined positions of the cleaning apparatus” *Id.* at 35:21–28 (claim 4).

“the receiving system configured to prior to initiation of a cleaning mission of the cleaning apparatus . . . autonomously

identify a predefined zone in the map based on the previously determined positions of the cleaning apparatus” *Id.* at 36:28–35 (claim 15).

As previously indicated, the parties refer to these limitations as the “autonomously identify” limitations. We also use this shorthand phrase to describe these limitations except where it is important to our analysis to refer to other claim language.

We determine that the Specification of the ’517 patent describes various ways that would be reasonably understood by a skilled artisan as describing how the receiving system of the claimed device autonomously identifies a “hot spot” or “predefined zone.” As a result, we further determine that the Specification of the ’517 patent adequately supports the “autonomously identify” limitations and the claims.

2. *Legal Standards*

To satisfy the written description requirement under 35 U.S.C. § 112(a), an application must “reasonably convey[] to those skilled in the art that the inventor had possession of” and “actually invented” the claimed subject matter. *Juno Therapeutics, Inc. v. Kite Pharma, Inc.*, No. 2020-1758, slip. op. at 6 (Fed. Cir. August 26, 2021) (*quoting Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc)). The test for adequate written description support “requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art. Based on that inquiry, the specification must describe an invention understandable to that skilled artisan and show that the inventor actually invented the invention claimed.” *Ariad.* at 1351. Although the specification need not “recite the claimed invention *in haec verba*, a description that merely renders the invention obvious does not satisfy the

[written description] requirement.” *Id.* at 1352. Whether the written description adequately supports a patent is a question of fact. *Vasudevan Software v. MicroStrategy, Inc.*, 782 F.3d 671, 682 (Fed. Cir. 2015).

Under 35 U.S.C. § 112(a), the patent must enable a skilled artisan to practice the invention without undue experimentation. *Wyeth & Cordis Corp. v. Abbott Labs, Inc.*, 720 F.3d 1380, 1384 (Fed. Cir. 2013). “An enablement analysis begins with the disclosure in the specification.” *Sitrick v. Dreamworks, LLC*, 516 F.3d 993, 1000 (Fed. Cir. 2008). “It is the specification, not the knowledge of one skilled in the art, must supply the novel aspects of an invention in order to constitute adequate enablement.” *Genentech Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1366 (Fed. Cir. 1997).

3. *Support for the Disputed Limitations in the Specification*

In order to determine whether the Specification of the ’517 patent supports the “autonomously identify” limitations to identify a “hot spot” or a “predefined zone” in a map as recited in independent claims 1, 4, and 15, we first consider the disclosure relating to a “receiving system . . . stor[ing] a map of at least a portion of the working environment based on previously determined positions of the cleaning apparatus” as recited in those claims. Ex. 1001, 34:42–46 (claim 1), 35:21–25 (claim 4), 36:28–32 (claim 15). Figure 12C of the ’517 patent is reproduced below.

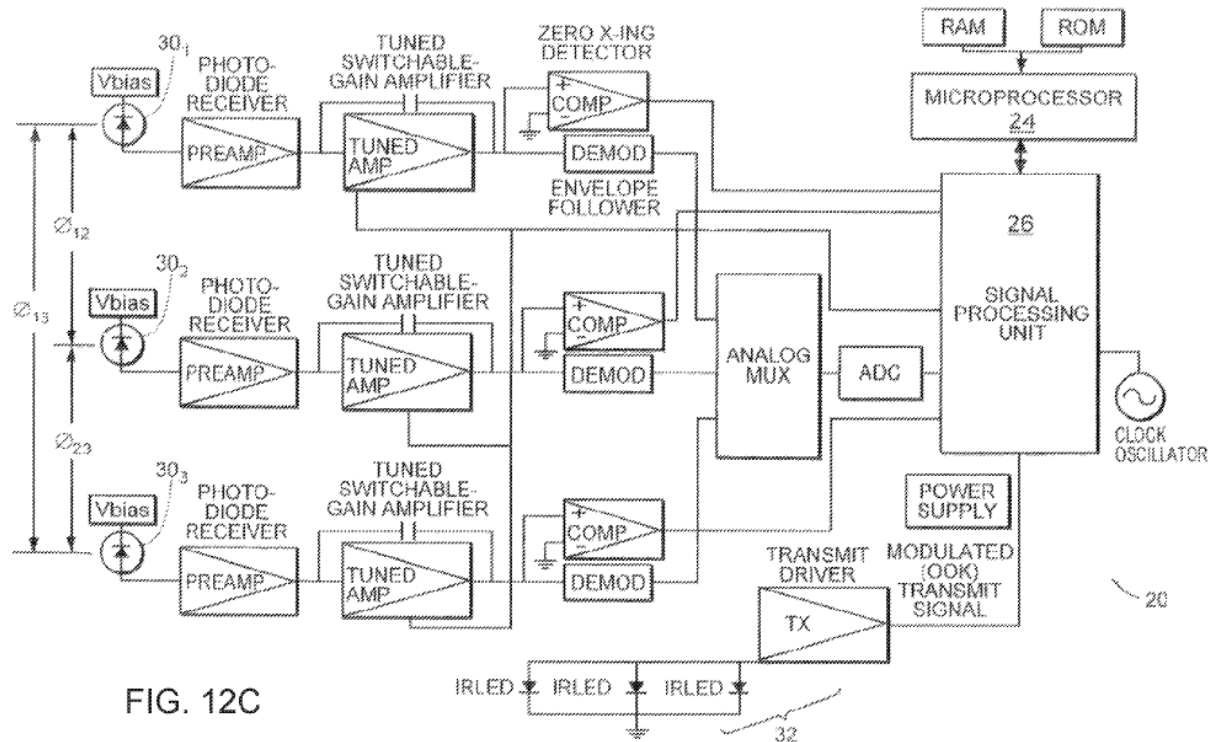


FIG. 12C

Figure 12C depicts a preferred embodiment of receiving subsystem 20 of the navigation control system. *Id.* at 7:32–33, 32:27–30. The Specification of the '517 patent states, “[t]he receiving subsystem 20 of the navigation control system 10 according to the present invention comprises a processing unit 22 that includes a microprocessor 24, a signal processing unit 26, a memory module 28, and a set of detection units 30_M.” *Id.* at 27:4–8, *see also* Fig. 9 (“a schematic depiction of a navigational control system that comprises a transmitting subsystem and a receiving subsystem” (*id.* at 7:6–8)). With regard to memory module 28 of receiving subsystem 20, the Specification discloses:

The memory module 28 comprises RAM 28A and ROM 28B. Data relating to the current operation of the robotic device 100 within the defined working area is stored in the RAM 28A. Such current operational data can include the grid map of cells C defining the defined working area and the position history of the robotic device 100 within the defined working area for the

'position history' embodiment of the navigational control system 10. Stored in the ROM 28B are one or more navigation control algorithms for the navigational control system 10, a set of one or more control signals associated with each navigation control algorithm, and a signal processing algorithm for converting signals generated by the signal processing unit 26 to one or more sets of instantaneous position parameters, i.e., a bearing, distance pair (and travel vector, if applicable). For the 'position history' embodiment of the system 10, a set of instantaneous position parameters that define the position history of the robotic device 100, which are correlated with the grid map to identify the cells C comprising the position history.

Id. at 27:13–31. In a described embodiment, “the receiving subsystem 20 is integrated in combination with the robotic device 100 [a]s illustrated in FIG. 13.” *Id.* at 33:33–35. As can be appreciated from these passages, the Specification describes storing a grid map and position history in the memory of the receiving (sub) system of robotic device 100. The Specification provides an example of a grid map in Figure 10, reproduced below.

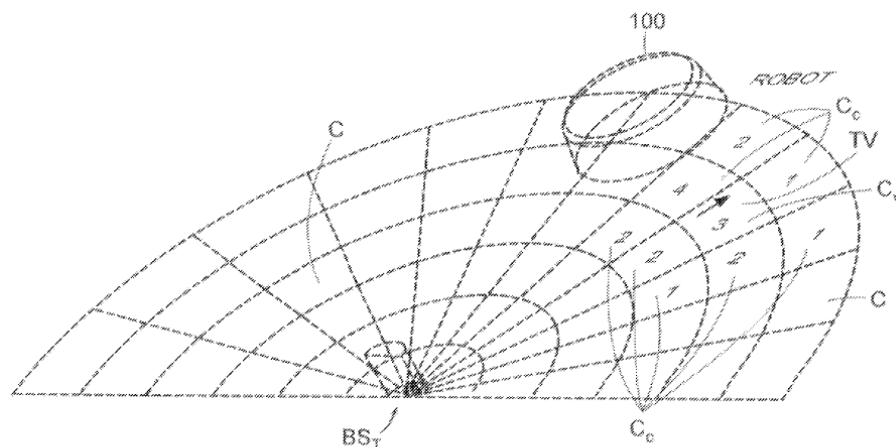


FIG. 10

Figure 10 depicts a grid map of a defined working area in which the robotic device is operating and the grid map is divided into a set of individual cells C. *Id.* at 7:9–10, 22:6–24. In the stored grid map, “[t]he position of each

cell C (in terms of its center) is identified in terms of polar coordinates (r, θ) referenced to the base station BST as the origin $(0, 0)$.” *Id.* at 22:16–18.

The Specification describes this method for creating the grid map with the position history of the robotic device:

Each discrete instantaneous position of the robotic device 100 is determined by operating the transmitting subsystem 12 to emit a set of directional beams and operating the receiving subsystem 20 to detect one or more of such directional beams and process a signal parameter of the detected beam(s) to determine an absolute bearing parameter and a distance parameter between the transmitting subsystem 12 and the receiving subsystem 20 at a point in time. Each pair of bearing, distance parameters establishes a discrete instantaneous position for the robotic device 100. For the preferred 'position history' embodiment, the navigational control system 10 is operative to correlate each discrete instantaneous position to one individual cell C of the grid map. A set of bearing and position pairs, i.e., a set of instantaneous positions, over a time interval defines a set of cells C, which are identified in the receiving subsystem 20 as the position history of the robotic device 100 for the time interval.

Id. at 22:41–58. We determine based on the description in the Specification of the '517 patent that a skilled artisan would understand that the inventors knew how to make a device that could autonomously create and store a map and would be enabled by the description in the Specification of the '517 patent to do so.

The Specification also states that robotic device 100 has left and right sensor elements that “generate separate left and right side debris signals that can be processed to signal the robotic device to turn in the direction of a ‘dirty’ area.” *Id.* at 12:6–8. As such, the Specification discloses that the robotic device 100 can autonomously steer itself towards an area that is

dirty. Upon detecting such an area, robotic device 100 can execute a cleaning mode including a “Spot Coverage pattern.” *Id.* at 12:33–35. “The Spot Coverage pattern causes the robotic device 100 to clean a limited area within the defined working area, e.g., a high-traffic area.” *Id.* at 12:37–39. “In a preferred embodiment the Spot Coverage pattern is implemented by means of a spiral algorithm . . . which causes outward spiraling (preferred) or inward spiraling movement of the robotic device 100.” *Id.* at 12:39–44.

Additionally, the Specification provides that “the microprocessor 24 is operative to count and store the number of visits to each cell and to compute the total number of visits to cells contiguous to (neighboring) each such visited cell (cell counting).” *Id.* at 27:45–48; *see also id.* at 28:24–27. The Specification states:

The microprocessor 24 is further operative to compare the total number of neighboring-cell visits as each cell is visited to a threshold value (see, e.g., FIG. 10 [depicting grid map (reproduced above)] wherein “Cv” identifies a visited cell and “Cc” identifies the eight (8) cells contiguous to the visited cell Cv). If the total number of neighboring-visits (e.g., fifteen (15) in the example of FIG. 10) for any visited cell is below the threshold number (the triggering event), the microprocessor 24 is operative to cause a control signal to be communicated to the robotic device 100. The control signal causes the robotic device 100 to implement one or more behavioral modes specified by the control signal, e.g., a Spot Coverage pattern as described above.

Id. at 27:48–60. We determine that a skilled artisan would understand from these passages that the Specification describes the receiving system of the robotic device autonomously determining which spots or areas have the most debris or have high traffic by determining which spots or areas are most visited.

With regard to the use of the term “hot spot,” there are two paragraphs⁵ in the Specification that use this term:

In another representative navigation control algorithm for the 'position history' embodiment of the navigational control system 10 of the present invention, one or more cells in the stored grid map are pre-identified (i.e., prior to operating the robotic device 100) as "hot spots" in the defined working area. As the robotic device 100 visits any particular cell C, the microprocessor 24 is operative to determine whether the visited cell has been identified as a "hot spot" (true-false determination). If the microprocessor 24 determines that the visited cell C is a "hot spot" (triggering event), the microprocessor 24 is operative to cause a control signal to be communicated to the robotic device 100 via the control signal transmitting unit 32. Reception of the control signal causes the robotic device 100 to implement the prescribed conduct specified by the control signal, e.g., one or more of the basic maneuvers described above and/or a Spot Coverage pattern or Obstacle-Following behavioral mode as described above.

* * *

Another exemplary navigation control algorithm for the 'instantaneous position' embodiment of the navigational control system 10 is a variation of the "hot spot" navigation control algorithm for the 'position history' embodiment of the navigational control system 10. In this illustrative embodiment, both position A and position B are known variables and accordingly, the basic maneuver(s) to move the robotic device 100 from position A to position B are known. In this example, the predetermined triggering event is a TRUE determination that the instantaneous position of the robotic device 100 is equal to position A (position A maybe stored in memory 28 as a "zone"-defining some arbitrary area centered about position A- rather than a single point position to increase the probability

⁵ The parties sometimes refer to the first of these paragraphs as the “‘hot spot’ paragraph” (Ex. 1001, 27:61–28:11). We sometimes use this term too.

that the instantaneous position of the robotic device 100 at some time will equal position A).

Ex. 1001, 27:61–28:11, 29:11–26.

4. Discussion

With this background as to the description of the invention in the Specification, we turn to consideration of Petitioner’s arguments that the “autonomously identify” limitations of the challenged, independent claims are not supported by the Specification. Petitioner’s argument that the “autonomously identify” limitations of independent claims 1, 4, and 15 are not supported by the Specification is based on language not found in the “autonomously identify” limitations recited in claims 1, 4, and 15. Petitioner’s argument focuses on a statement in the Specification (*id.* at 27:63–66) that “one or more cells in the stored grid map are pre-identified (i.e., prior to operating the robotic device 100) as ‘hot spots’ in the defined working area.” *See* Pet. 23–25. However, in claim 1, which uses “hot spot” as a claim term, the recitation as to the timing of the “autonomously identify a hot spot in a map” limitation is different and specifically recites, “prior to initiation of a cleaning mission of the cleaning apparatus.” Ex. 1001, 34:43–44. Claims 4 and 15 are in accord and recite that “autonomously identify[ing] a predefined zone in a map” occur “prior to initiation of a cleaning mission of the cleaning apparatus.” *Id.* at 35:22–26, 36:29–33. The proper focus to understanding these claim limitations and whether they are supported should be on the plain meaning of the specific language of the claims without reading a different meaning into the claim language that is not supported by the claim language. *Trebo Mfg., Inc. v. Firefly Equip., LLC*, 748 F.3d 1159, 1166 (Fed. Cir. 2014) (it is improper to import a

limitation into a claim from a preferred embodiment). Thus, we must first consider what the claim language requires.

Claim 1 recites an apparatus and requires the receiving system be configured to “autonomously identify a hot spot,” which requires that the device perform the action itself. Thus, the claim language excludes a user performing the claimed identification.⁶ The question is whether the Specification supports that language.

Patent Owner argues that the language in the Specification—“pre-identified . . . prior to operating the robotic device”—includes “*during a prior operation of the robot* (e.g., during a past cleaning operation).” Prelim. Resp. 33–35 (citing Ex. 1001, 27:42–28:11). We determine that this meaning is supported by the Specification. As Patent Owner contends, the Specification discloses identifying “hot spot” cells during an operation and using those cells to maneuver the device both during the same operation and also in a later operation. *Id.* Thus, a reasonable interpretation of “prior to operating the robotic device” includes “during a past cleaning mission of the

⁶ In an Applicant-Initiated Interview Summary, the Examiner wrote that he and the Applicant’s attorney “discussed, including specifying that the identify step is performed *autonomously, or without human input.*” Ex. 1001, 212 (emphasis added). In the Applicant’s attorney’s interview summary of the same conversation that was included with the claim amendment adding the “autonomously identify” limitation, the Examiner’s characterization of the meaning of “autonomously” was not disputed. *Id.* at 225. The Applicant relied on the addition of the “autonomously identify” limitation to the claims to distinguish the cited art but did not discuss its meaning. *Id.* at 226 (“Allen fails to describe *autonomously* identifying a hot spot. Independent claim 13 [issued claim 1] is therefore allowable over Taylor and Allen.”). However, both Petitioner and Patent Owner acknowledge that Allen (US Patent No. 5,995,884) discloses a user selecting a spot or zone. Pet. 25, Prelim. Resp. 41 (citing Ex. 1027 (Allen), 47:1–28).

cleaning apparatus,” because such an interpretation is consistent with the Specification.

Addressing the Specification’s disclosures, Petitioner argues that “one skilled in the art would have understood this disclosure—that the cells are pre-identified prior to operating the robotic device—to mean that the robotic device does not perform the identification.” Pet. 25. Petitioner also argues that “one skilled in the art would have understood that a known and common way of pre-identifying such cells prior to operation of the device would have been for the *user* to perform the pre-identification, i.e., that the identification was not done autonomously.” *Id.* at 25 (citing Ex. 1003 (Cowan Decl.) § 43). Patent Owner responds that, notwithstanding that it was known for users to identify hot-spot cells prior to operation, that “does not support a finding that initial user pre-identification is the only way of pre-identifying a cell, much less a finding of how a POSITA [person of ordinary skill in the art] would understand the pre-identification step in *the “hot spot” paragraph*.” Prelim. Resp. 41. We agree with Patent Owner.

Petitioner’s last such argument is based on the second paragraph (Ex. 1001, 29:10–26) from the Specification in which “hot spots” is used. Pet. 26–27. Petitioner argues that this paragraph does not disclose “identifying a predefined zone in a map.” *Id.* The specific language in the Specification that Petitioner relies on states, “*position A may be stored in memory 28 as a ‘zone’*—defining some arbitrary area centered about position A—rather than a single point position.” *Id.* (quoting Ex. 1001, 29:21–24). Contrary to Petitioner’s argument, we determine that this paragraph (including the specific passage Petitioner quotes), in the context of the Specification of the ’517 patent, supports the “autonomously identify”

limitations of the claims, especially the limitations in claims 4 and 15 that recite “autonomously identify a predefined zone in the map.” Ex. 1001, 35:21–28 (claim 4), 36:28–35 (claim 15). In short, we do not find persuasive the arguments in the Petition that the “autonomously identify” limitations recited in independent claims 1, 4, and 15 are not supported by the Specification of the ’517 patent, because those arguments are not based on consideration of the specific language recited in the claims.

Patent Owner argues that Petitioner’s arguments are contradicted by the first sentence of the “hot spot” paragraph. Prelim. Resp. 38–39. Specifically, Patent Owner argues that this sentence, “disclose[s] *what* pre-identifies the ‘hot spot’ and *how* this identification happens.” *Id.* The first sentence of the “hot spot” paragraph states, “[i]n another representative **navigation control algorithm for the ‘position history’ embodiment of the navigational control system 10 of the present invention**, one or more cells in the stored grid map are pre-identified (i.e., prior to operating the robotic device 100) as ‘hot spots’ in the defined working area.” Ex. 1001, 27:61–66 (emphasis added). Patent Owner contends:

The language in bold plainly describes pre-identification of “hot spots” as an example of a “**position history** embodiment of the **navigational control system**.” In doing so, this dependent clause offers both the “what” (the navigational control system) and the “how” (using position history). The absence of evidence directed to the meaning of this dependent clause is telling, and it leaves the Petition with a gaping hole and unable to sustain that unpatentability of at least one claim under the written description requirement is more likely than not.

Prelim. Resp. 38–39. We find this argument persuasive as we determine that it is supported by the Specification.

In the Reply, Petitioner argues that Patent Owner is wrong to rely on the reference to “navigation control system 10” in the first sentence of the “hot spot” paragraph (Ex. 1001, 27:61–28:11) because the “navigation control system 10” comprises both the “transmitting subsystem 12” and the “receiving subsystem 20.” Reply 7. The Reply states, “[t]hus, even if it were correct that the ‘navigation control system’ identifies the hot spot (it is not), the patent never discloses that the ‘receiving system’ does the identifying.” *Id.* However, this argument is contradicted by the description in the Specification of microprocessor 24 doing the identifying of spots and areas (*id.* at 27:48–60) and of the microprocessor 24 as part of the receiving (sub)system (*id.* at 27:4–8). We do not find Petitioner’s criticism of Patent Owner’s argument persuasive.

Patent Owner argues that Petitioner’s arguments are further contradicted by the Specification when the “hot spot” paragraph (Ex. 1001, 27:61–28:11) is considered in light of the paragraph that precedes it in the Specification. *See* Prelim. Resp. 39–40. Patent Owner refers to these paragraphs from the Specification as paragraph 1 (Ex. 1001, 27:32–60) and paragraph 2 (*id.* at 27:61–28:11). *See* Prelim. Resp. 30. With regard to paragraph 1, Patent Owner argues:

Paragraph 1, for example, describes autonomous identification of a cell based on position history (e.g., previous visits to cells) performed by a navigational control system, and it describes the navigational control system 10 performing this autonomous identification *as the robotic device 100 visits a cell* to determine whether the position history (i.e., previous visits to neighboring cells) indicates that the triggering event has happened.

Prelim. Resp. 39–40 (citing Ex. 1001, 27:48-50). With regard to paragraph 2, Patent Owner argues:

Paragraph 2 [the “hot spot” paragraph] is a “position history” embodiment and thus uses “position history” for causing the robotic device 100 to implement a prescribed conduct. As noted above, paragraph 2 flows from the description offered for the “position history” embodiment in Paragraph 1, where the prescribed conduct is *based on the position history generated in a current operation of the robotic device*. Complementing that paragraph 1 description of the position history embodiment, Paragraph 2 describes triggering the prescribed conduct *based on the position history generated in a prior operation of the robotic device*. And Paragraph 2 further describes determining that a visited cell is a pre-identified “hot spot,” i.e., determining that an instantaneous position of the robotic device 100 is one of the one or more cells of the “hot spot” pre-identified based on the position history.

Id. at 35. Patent Owner’s interpretation of these paragraphs is supported by these paragraphs and consistent with the other portions of the Specification. We determine that Patent Owner’s interpretation of the “hot spot” paragraph (paragraph 2) is more reasonable than Petitioner’s interpretation in the context of the Specification and consistent with a determination that the Specification supports the “autonomously identify” limitations of the claims.

With specific regard to enablement, the Petitioner argues:

The ’517 patent does not enable one skilled in the art to practice the inventions of claims 1, 4, and 15 because it does not provide any working example or guidance for performing the “autonomously identify” limitations—the very limitations that were allegedly novel over the prior art, resulting in the grant of the ’517 patent. Cowan [Ex. 1003], ¶¶ 90-91. Here, the ’517 patent’s complete lack of direction to the skilled artisan for the allegedly novel feature renders the claims invalid for lack of enablement.

Pet. 51. Petitioner also argues that “the ’517 patent provides no working examples or guidance teaching one skilled in the art *how* to” “autonomously identify a hot spot or predefined zone in a map prior to initiation of a cleaning mission” and that “the ’517 patent does not even provide a ‘conceptual’ figure or description of how a receiving system performs the ‘autonomously identify’ limitation.” *Id.* at 53, 55. And still further, Petitioner argues that “[t]he ’517 patent’s complete failure to provide any example, direction, or guidance to the skilled artisan is dispositive and renders the claims invalid for lack of enablement.” *Id.* at 55. For factual support of its enablement argument, Petitioner refers back to its explanation as to how the ’517 patent fails to meet the written description requirement. *Id.* at 53.

We reject Petitioner’s enablement ground for the same reasons we reject its written description ground. Based on the showing in the Petition, we are not persuaded that the Specification of the ’517 patent “does not provide any working example or guidance for performing the ‘autonomously identify’ limitation” or that there is no disclosure adequate to “teach[] one skilled in the art *how* to” “autonomously identify a hot spot or predefined zone in a map prior to initiation of a cleaning mission.” To the contrary, for the reasons detailed above, we determine that the “autonomously identify” limitations are adequately supported by the Specification of the ’517 patent and that the Specification of the ’517 patent would enable a skilled artisan to make and use the invention.

D. Eligibility for Post-Grant Review

The post-grant review provisions of the Leahy-Smith America Invents Act (“AIA”)⁷ apply only to patents subject to the first inventor to file provisions of the AIA. AIA § 6(f)(2)(A). Specifically, the first inventor to file provisions apply to any application for patent, and to any patent issuing thereon, that contains or contained at any time a claim to a claimed invention that has an effective filing date on or after March 16, 2013. AIA § 3(n)(1). An application’s “effective filing date” is the filing date of the earliest application for which the application is entitled to priority. 35 U.S.C. § 100(i)(1)(B). An application is not entitled to the priority date of an earlier application, however, if the earlier application does not disclose the claimed invention “in the manner provided by section 112(a) (other than the requirement to disclose the best mode).” *Id.* §§ 119(e), 120.

Petitioner argues that “[t]he ’517 patent is eligible for PGR [post-grant review] because its claims are not supported or enabled by any of its pre-AIA parent applications or its own specification. Thus, each of the claims of the ’517 patent have an effective filing date of later than March 16, 2013 and are PGR-eligible.” Pet. 17 (citations omitted). However, Petitioner acknowledges that “the post-grant-review eligibility of the ’517 patent ‘hinges on’ the same written description and enablement” arguments discussed above. *Id.* at 19. The Petition states, “because the ’517 patent includes all the disclosures of its prior applications, none of the prior applications provide written description or enablement support for any of the challenged claims either.” *Id.* at 20; *see also id.* at 8 (“The ’571 patent claims priority to twelve nonprovisional applications . . . [and] includes the

⁷ Pub L. No. 112-29, 125 Stat. 284 (2011).

subject matter of the twelve nonprovisional applications almost verbatim.”). Eleven of these twelve nonprovisional applications were filed prior to March 16, 2013. Ex. 1001, code (63). And, Petitioner acknowledges, “those priority applications have the same disclosure as the ’517 patent.” Pet. 1. Thus, our determination that the Specification of the ’517 patent adequately supports the “autonomously identify” limitations compels the additional determination that the ’517 patent fails to satisfy the statutory requirements for post-grant review.

E. Patent Owner’s Argument under 35 U.S.C. § 324(a) Based on Parallel Proceeding

In the Preliminary Response, Patent Owner requests that the Board exercise its discretion to deny institution under 35 U.S.C. § 324(a)⁸ on the basis that there is a parallel proceeding, the ITC investigation, and “as . . .

⁸ 35 U.S.C. § 324(a) states that:

[t]he Director may not authorize a post-grant review to be instituted unless the Director determines that the information presented in the petition filed under section 321, if such information is not rebutted, would demonstrate that it is more likely than not that at least 1 of the claims challenged in the petition is unpatentable.

The portion of the statute reading “[t]he Director may not authorize . . . unless” mirrors the language of 35 U.S.C. § 314(a), which concerns *inter partes* review. This language of sections 314(a) and 324(a) provides the Director with discretion to deny institution of a petition. See *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2140 (2016) (“[T]he agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion.”); Consolidated Trial Practice Guide November 2019 at 55 (*available at* <https://www.uspto.gov/TrialPracticeGuideConsolidated>).

the ITC and parties to it will have earlier devoted substantial resources in resolving a decision on the same issues raised by the Petition, all before the Board's projected Final Written Decision." Prelim. Resp. 3. We do not consider whether discretionary denial under 35 U.S.C. § 324(a) would be appropriate in light of our decision not to institute post-grant review because Petitioner has failed to meet its burden of showing that its alleged grounds of unpatentability have sufficient merit to support institution or that the challenged claims are eligible for post-grant review.

III. CONCLUSION

We deny institution of post-grant review because the information presented in the Petition does not demonstrate that it is more likely than not that at least 1 of the claims challenged in the Petition is unpatentable and does not establish the challenged claims are eligible for post-grant review.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is *denied* as to all challenged claims, and no trial is instituted.

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