

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HESAI TECHNOLOGY CO. LTD.,
Petitioner,

v.

OUSTER, INC.,
Patent Owner.

IPR2023-01421
Patent 11,175,405 B2

Before MEREDITH C. PETRAVICK, KEVIN W. CHERRY and
JON M. JURGOVAN, *Administrative Patent Judges*.

CHERRY, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Hesai Technology Co. Ltd. (“Petitioner”) filed a petition to institute *inter partes* review of claims 21 and 23–34 of U.S. Patent No. 11,175,405 B2 (Ex. 1001, “the ’405 patent”). Paper 1 (“Pet.”). Ouster, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”).

We have authority under 35 U.S.C. § 314 to determine whether to institute an *inter partes* review. The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted unless “there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” The Supreme Court has held that the Board, in a decision to institute under 35 U.S.C. § 314(b), may not institute review on less than all claims challenged in the petition. *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1355–56 (2018). Moreover, in accordance with our rules, “[w]hen instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.” 37 C.F.R. § 42.108(a) (2020); *see also PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018) (interpreting the statute to require “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”).

Applying those standards, and upon considering the Petition, the Preliminary Response, and the evidence of record, we determine the information presented shows a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of at least one of the challenged claims of the ’405 patent. Accordingly, we institute an *inter partes* review of all challenged claims (i.e., claims 21 and 23–34) of the ’405 patent, based on the grounds asserted in the Petition.

II. BACKGROUND

A. *Related Matters*

The parties identify the following proceeding as related matters involving the '405 patent: *Ouster, Inc. v. Hesai Group et al.*, Case No. 23-cv-00406 (D. Del.) and *Certain LIDAR (Light Detection and Ranging) Systems and Components Thereof*, Inv. No. 337-TA-1363 (ITC). Pet. 2; Paper 4,1. Petitioner also states that it is also seeking institution of IPRs “against four other patents that Ouster asserted against Hesai in the aforementioned litigation.” Pet. 3.

B. *Real Parties in Interest*

Petitioner identifies itself, Hesai Group, and Hesai Inc. as the real parties-in-interest. Pet. 2. Patent Owner identifies itself as the real party-in-interest. Paper 4, 1.

C. *The '405 Patent*

The '405 patent is titled “Spinning LIDAR^[1] Unit with Micro-Optics Aligned behind Stationary Window.” Ex. 1001, Code (54). The '405 patent claims priority to Provisional Application Nos. 62/506,449; 62/506,437; and 62/506,445 all filed on May 15, 2017, as well as Provisional Application No. 62/515,291 filed on June 5, 2017. *Id.* at Code (60).

The '405 patent relates to optical imager systems that achieve wide field-of-view, narrowband imaging with micro-optic receiver channel arrays. *Id.* at 2:63–65. In some embodiments described in the '405 patent, the

¹ “LIDAR” or “LiDAR” stands for light detection and ranging. *See* Pet. 1; Prelim. Resp. 1.

optical imager system “includes a light emission system and a light detection system.” *Id.* at 3:29–31.

The '405 patent explains that narrowband imagers collect “light within a limited wavelength range” using optical filters. *Id.* at 1:34–40. “Optical filters serve to prevent some portion of the electromagnetic spectrum from reaching the photodetectors.” *Id.* at 1:40–42. According to the '405 patent, “[o]ptical filters are sensitive to the angle of incident light making it difficult to achieve a narrow range of wavelengths.” *Id.* at 1:53–55.

Figure 2 of the '405 patent is shown below.

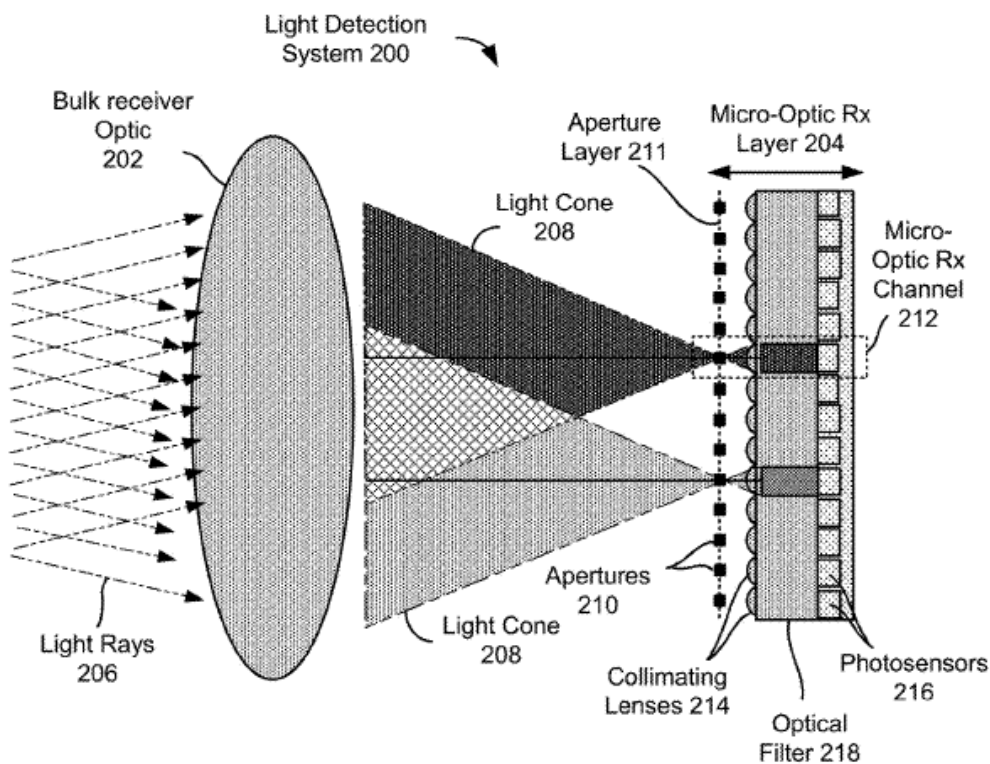


FIG. 2

Figure 2, above, is a diagram illustrating a light detection system. During operation of the light detection system, light rays 206 enter a bulk receiver optic 202 and are focused into light cones 208. *Id.* at 13:39–42. A micro-

optic receiver layer “is positioned so that apertures 210 coincide with the focal plane of bulk receiver optic 202.” *Id.* at 13:42–44. The receiver layer “can be a one-dimensional or two-dimensional array of micro-optic receiver channels 212.” *Id.* at 13:44–46. The receiver channels “is formed of a respective aperture 210, collimating lens 214, and photosensor 216 positioned along the same axis in the direction of light flow.” *Id.* at 13:46–49.

Photosensors “can be pixelated light sensors that employ, for each photosensor, a set of discrete photodetectors such as single photon avalanche diodes (SPADs).” *Id.* at 21:54–58. The photosensors 216 “are positioned on a side opposite of collimating lenses 214 so that light rays 206 first pass through collimating lenses 214 and optical filter 218.” *Id.* at 14:29–32. The optical filters block “unwanted wavelengths of light.” *Id.* at 14:10.

Figure 11 of the '405 patent is shown below.

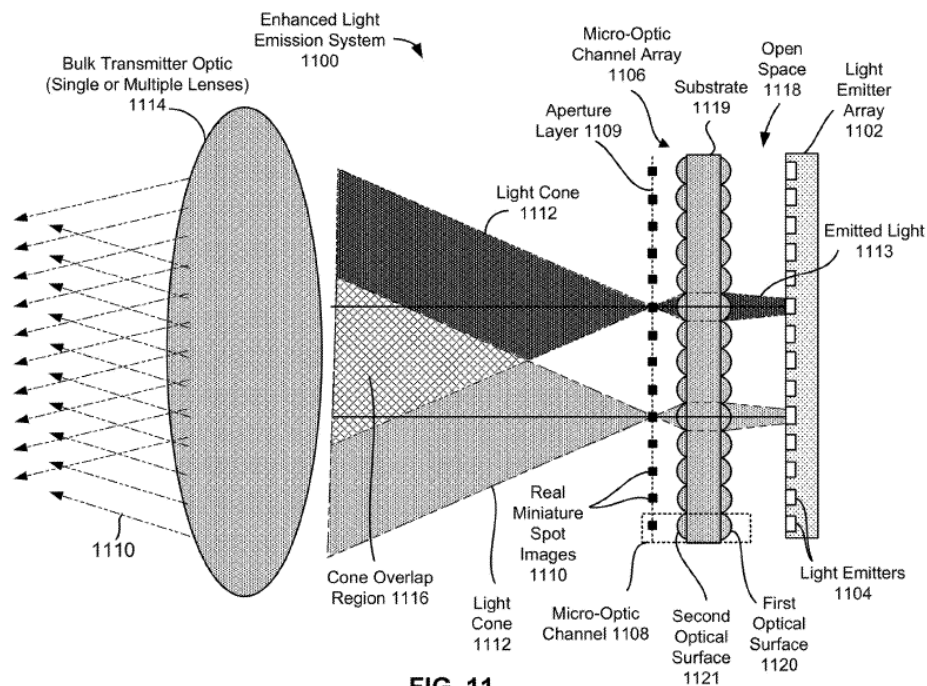


Figure 11, above, is a diagram of an exemplary light emission system. *Id.* at 28:59–60. The light emission system “can include a light emitter array 1102” and a “micro-optic transmitter channel array 1106 separated from light emitter array 1102 by an open space 1118.” *Id.* at 28:62–65, 29:4–6. “Each micro-optic transmitter channel 1108 is paired with a corresponding receiver channel.” *Id.* at 29:6–8.

D. The Challenged Claims

Petitioner challenges claims 21 and 23–34. Pet. 1. Of the challenged claims, claims 21 and 26 are independent. Claim 21, reproduced below with Petitioner’s identifiers for the claim limitations, is illustrative of the claimed subject matter.

- [21(a)]** An optical system for performing distance measurements, the optical system comprising:
- [21(b)]** a stationary housing having a base, a top and an optically transparent window disposed between the base and the top and extending fully around a periphery of the stationary housing;
- [21(c)]** a light ranging device disposed within the housing and comprising:
- [21(d)]** a platform;
- [21(e)]** a light transmission module coupled to the platform and comprising a bulk transmitter optic and a plurality of optical emitters, each optical emitter in the plurality of optical emitters configured to generate and transmit pulses of radiation through the bulk transmitter optic and through the optically transparent window into a field external to the optical system; and
- [21(f)]** a light sensing module coupled to the platform and comprising a bulk receiver optic, an aperture

layer comprising a plurality of apertures separated by a stop region, a plurality of photosensors operable to detect photons emitted from the plurality of optical emitters and received through the bulk receiver optic after being reflected from surfaces within the field, and an optical filter disposed between the bulk receiver optic and the plurality of photosensors and configured to allow a band of radiation, including an operating wavelength of the plurality of optical emitters, to pass through the filter to the plurality of photosensors while blocking radiation outside the band from reaching the plurality of photosensors; and

[21(g)] a motor disposed within the housing and operatively coupled to spin the platform and the light ranging device within the housing;

[21(h)] wherein: each photosensor in the plurality of photosensors comprises a plurality of single photon avalanche diodes (SPADs);

[21(i)] the plurality of apertures comprises at least first, second, third and fourth apertures;

[21(j)] the plurality of photosensors comprises at least first, second, third and fourth photosensors; and the light sensing module includes a first optical path to the first photosensor through the first aperture, a second optical path to the second photosensor through the second aperture, a third optical path to the third photosensor through the third aperture, and a fourth optical path to the fourth photosensor through the fourth aperture.

Ex. 1001, 56:40–57:21.

E. Evidence

Petitioner submits the following evidence:

Evidence	Exhibit No.
Declaration of James F. Shanley, Ph.D.	1003
Pacala et al., US 2014/0211194 A1 (published July 31, 2014, filed Jan. 27, 2014) (“Pacala”)	1004
Spector, US 10,473,766 B2 (issued Nov. 12, 2019, filed June 27, 2017) (“Spector”)	1005
Droz et al., US 10,605,984 B2 (issued Mar. 31, 2020, filed Dec. 1, 2016) (“Droz”)	1006
Villeneuve et al., US 10,520,602 B2 (issued Dec. 31, 2019, filed Nov. 29, 2016) (“Villeneuve”)	1007
Hall et al., US 9,983,297 B2 (issued May 29, 2018, filed Mar. 20, 2017) (“Hall”)	1008
Borowski, US 2013/0300840 A1 (published Nov. 14, 2013, filed Dec. 21, 2011) (“Borowski”)	1009

F. Asserted Grounds

Petitioner asserts the following grounds of unpatentability:

Claims Challenged	35 U.S.C. §²	Reference(s)/Basis
21, 23, 26–31, 34	103	Pacala, Droz
24, 25, 32, 33	103	Pacala, Droz, Villeneuve
21, 23–33	103	Hall, Borowski, Spector
34	103	Hall, Borowski, Spector, Droz

III. PATENTABILITY ANALYSIS

Petitioner contends that claims 21, 23, 26–31, and 34 of the ’405 patent are unpatentable under 35 U.S.C. § 103(a) over Pacala and Droz; claims 24, 25, 32, and 33 are unpatentable under 35 U.S.C. § 103(a) over Pacala, Droz, and Villeneuve; claims 21 and 23–33 are unpatentable under

² The Leahy-Smith America Invents Act, Pub. L. No. 112–29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. §§ 102, 103. Because the ’405 patent has an effective filing date after the effective date of the applicable AIA amendment, we refer to the AIA version of § 103.

35 U.S.C. § 103(a) over Hall, Borowski, and Spector; and claim 34 is unpatentable under 35 U.S.C. § 103(a) over Hall, Borowski, Spector, and Droz. Pet. 4–5.

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) when in evidence, objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

“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 organize our patentability analysis into four sections. First, we address the level of ordinary skill in the art. Second, we address claim construction. Third, we provide an overview of the asserted references.

And fourth, taking account of the information presented, we consider whether the Petition satisfies the threshold requirement for instituting an *inter partes* review under 35 U.S.C. § 314(a).

A. Level of Ordinary Skill in the Art

We consider the asserted grounds of unpatentability in view of the understanding of a person of ordinary skill in the art. In assessing the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quoting *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986)). “[O]ne or more factors may predominate.” *Id.*

Petitioner contends that a person of ordinary skill in the art would have “had an undergraduate degree in mechanical or electrical engineering or physics and two to three years of experience in LiDAR design.” Pet. 12. Petitioner further contends that “[l]ess work experience may be compensated by a higher level of education or vice versa.” *Id.*

Patent Owner “adopts Petitioner’s definition of a [person of ordinary skill in the art] as having an undergraduate degree in mechanical or electrical engineering or physics and two to three years of experience in LiDAR design” for purposes of its Preliminary Response. Prelim. Resp. 4.

Accordingly, for purposes of this Decision, we apply Petitioner’s definition of a person of ordinary skill in the art.

B. Claim Construction

We consider the proper construction of the claims. In interpreting the claims of the '628 patent, we “us[e] the same claim construction standard that would be used to construe the claim[s] in a civil action under 35 U.S.C. [§] 282(b).” *See* 37 C.F.R. § 42.100(b) (2020). The claim construction standard includes construing claims in accordance with the ordinary and customary meaning of such claims as would have been understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. *See id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc).

Petitioner contends that the parties exchanged preliminary constructions in a co-pending ITC case³ involving the '405 patent; however, no “terms require construction to resolve the patentability dispute.” Pet. 12. Petitioner further argues that “Petitioner demonstrates how the prior art renders obvious the challenged claims under any proposed construction.” *Id.*

Patent Owner argues that Petitioner “proposed the following construction for the term ‘aperture’” in the ITC case: “a small hole that defines a field of view for an individual pixel.” Prelim. Resp. 16 (citing Ex. 2001, 2).

Having considered the record, we determine that no express claim construction is necessary for any claim terms. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (holding that only claim terms in controversy need to be construed, and only

³ We note that Patent Owner has informed us that the co-pending ITC investigation has since been terminated without any final claim construction. *See* Prelim. Resp. 3.

to the extent necessary to resolve the controversy (citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

C. Prior Art

Before turning to Petitioner's asserted grounds of unpatentability, we provide brief summaries of the asserted references.

1. Pacala

Pacala is titled "Cost-Effective LIDAR Sensor for Multi-Signal Detection, Weak Signal Detection and Signal Disambiguation and Method of Using Same." Ex. 1004, Code (54). Pacala relates to "the use of cost-effective robust time-of-flight (ToF) lidar sensors for real-time wide-field-of-view three-dimensional mapping and object detection." *Id.* ¶ 3. Pacala describes a "lidar-based apparatus" that is "used for multi-signal detection, weak signal detection and signal disambiguation." *Id.* ¶ 10.

Figure 1 of Pacala is show below.

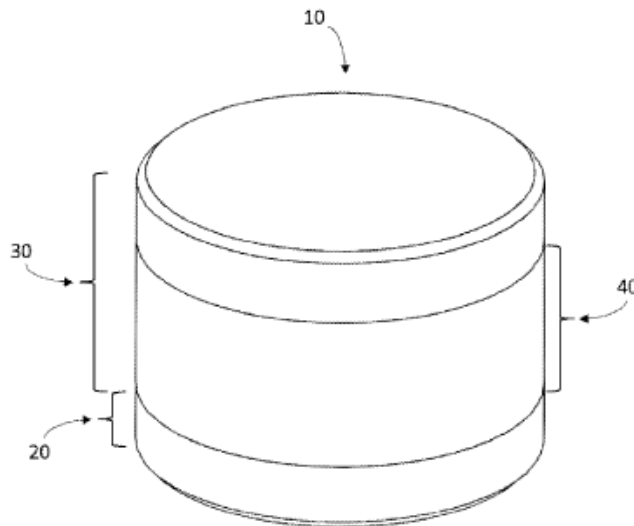


Fig. 1

Figure 1, above, is a schematic diagram of an external view of a lidar sensor.

Id. ¶ 12. Pacala’s lidar sensor 10 contains static base 20, static head assembly 30, and window 40. *Id.*

Figure 2 of Pacala is shown below.

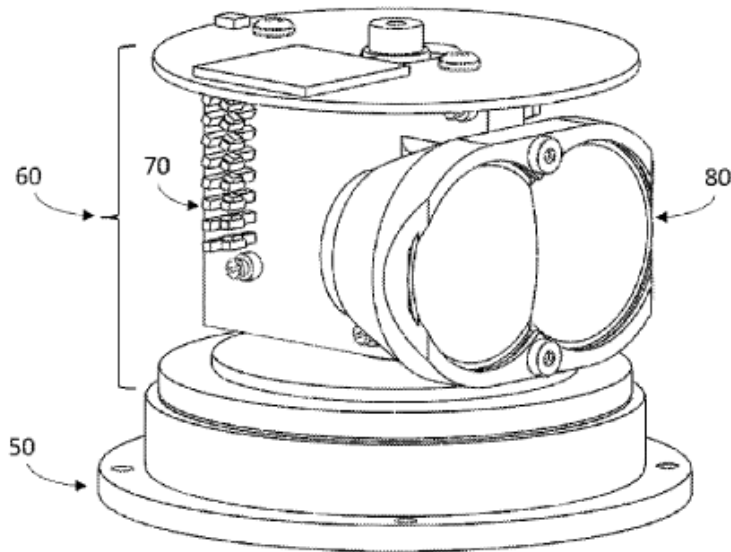


Fig. 2

Figure 2, above, is a schematic diagram of an internal view of a lidar sensor.

Id. ¶ 13. Figure 2 of Pacala depicts a motor and “spinning turret 60 that contains optoelectronic components 70 (including optical transmitters and receivers).” *Id.* ¶ 13.

2. Droz

Droz is titled “Array of Waveguide Diffusers for Light Detection Using an Aperture.” Ex. 1006, Code (54). Droz relates to a system for limiting “noise on light detectors using an aperture.” *Id.* at Code (57). Figure 3B of Droz is shown below.

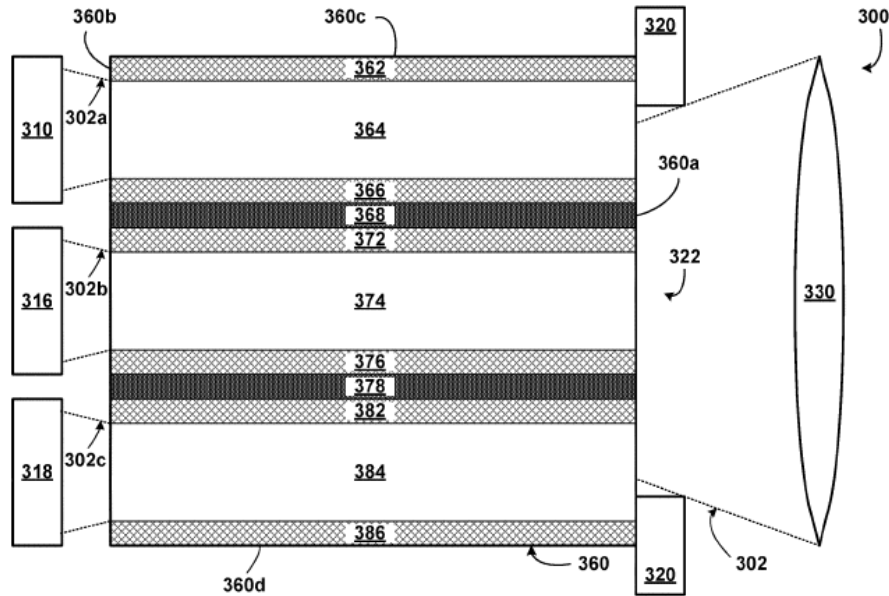


FIG. 3B

Figure 3B, above, illustrates a cross-section view of a noise limiting system. *Id.* at 2:44–48. Figure 3B includes a light detector array which includes a plurality of light detectors. *Id.* at 13:1–6. The system “also includes an opaque material 320, an aperture 322, and a lens 330,” as well as “a waveguide array 360 interposed between aperture 322 and arrays 310, 316, 318.” *Id.* at 13:13–22.

3. Hall

Hall is titled “LIDAR Based 3-D Imaging with Varying Illumination Field Density.” Ex. 1008, Code (54). Hall relates to “performing three dimensional LIDAR measurements.” *Id.* at Code (57). Hall’s “LIDAR systems employ pulses of light to measure distance to an object.” *Id.* at 1:21–23. Figure 2 of Hall is shown below.

Figure 1 of Borowski is shown below.

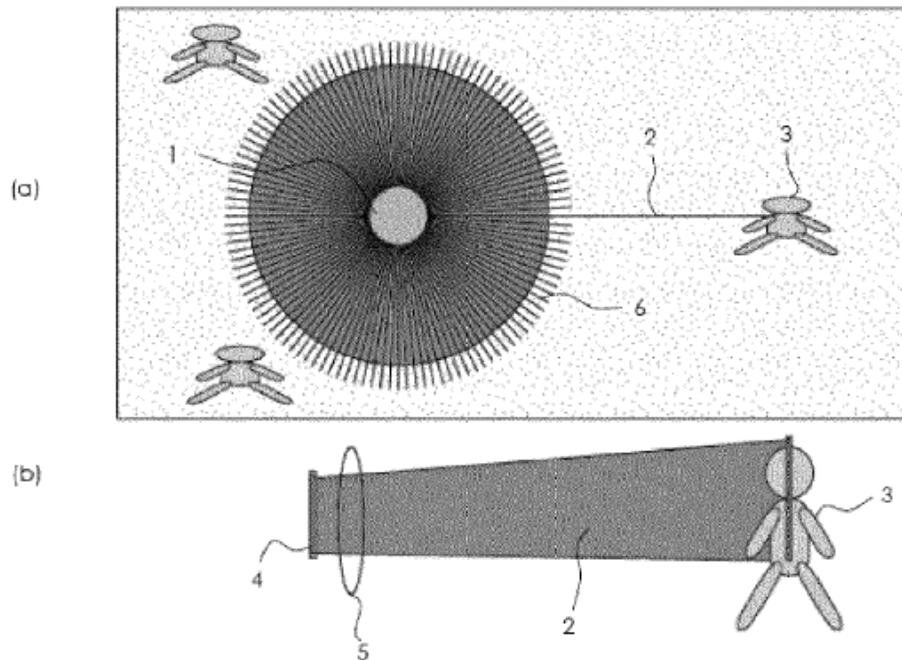


Fig. 1

Figure 1, above, illustrates top and front views of a 3D real-time landscape imager. *Id.* ¶ 25. Figure 1 depicts an imager 1, which captures multiple successive “slices” of a 3D surrounding. *Id.* ¶ 41. The slices “can be seen as a vertical array of pixels,” which are acquired with rotating Single Photon Avalanche Diodes (SPADs) detector arrays. *Id.*

Borowski explains that the “combination of the 3D data of all SPAD detector arrays generates a complete image of the landscape.” *Id.* ¶ 43.

5. *Spector*

Spector is titled “Light Detection and Ranging (LIDAR) System and Method.” Ex. 1005, Code (54). *Spector* relates to LIDAR systems and scanning methods to create “a two-dimensional array of light spots.” *Id.* at Code (57). Figure 1 of *Spector* is shown below.

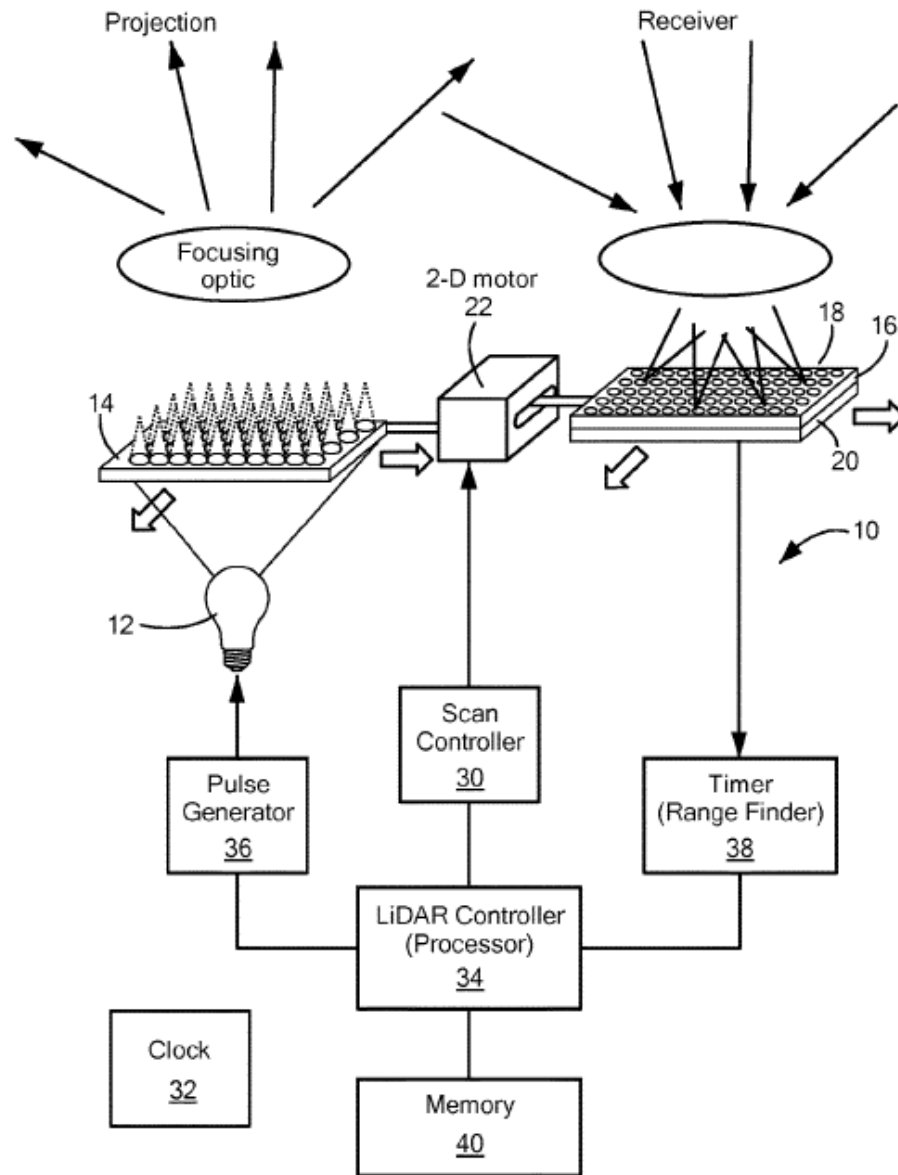


FIG. 1

Figure 1, above, is a schematic diagram of a LIDAR system. *Id.* at 2:28–29. Figure 1 contains “a single light source 12,” which “transmits light through an arrayed micro-optic 14.” *Id.* at 3:1–3. Spector’s “arrayed micro-optic may use methods such as a diffractive optic, a lens array[,], or a simple aperture array.” *Id.* at 3:12–14.

Figure 1 also depicts “an array of optical detection sites” formed in “receiver optics 16.” *Id.* at 3:32–34. “A pixelated optical sensor array 20 may work alone or in conjunction with an aperture array 18 for defining the optical detection sites on the sensor array.” *Id.* at 3:43–45. Spector explains that “[f]or detectors with a large fill factor, an aperture array may be beneficial to establish the individual optical detection sites.” *Id.* at 3:54–56.

D. Alleged Ground of Unpatentability Over Hall, Borowski, and Spector

Petitioner contends that claims 21 and 23–33 of the ’405 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Hall, Borowski, and Spector. Pet. 44–76. Patent Owner offers counterarguments. Prelim. Resp. 32–47.

1. Motivation to Combine Hall, Borowski, and Spector

a) Petitioner’s Contentions

Petitioner argues that a person of ordinary skill in the art would have been motivated to combine Hall, Borowski, and Spector with a reasonable expectation of success. Pet. 56–58. Petitioner contends that Hall describes many standard components of a rotating LiDAR device for autonomous vehicle applications, but lacks low-level implementation details of its emitters and receivers, so a person of ordinary skill in the art would have thus looked to other references in the field, such as Borowski and Spector, to implement and improve the emitters and detectors within Hall’s LiDAR system. *Id.* at 56. In particular, Petitioner asserts that Borowski specifically teaches an improved detector implementation using SPAD arrays, which could predictably and beneficially be applied to Hall’s system with a reasonable expectation of success, and Spector teaches adding an aperture array to detectors to improve a conventional LiDAR system by reducing

crosstalk and multipath signals. *Id.* Petitioner contends that this would have predictably and beneficially improved Hall's device. *Id.*

In particular, Petitioner argues that a person of ordinary skill in the art would have been motivated to modify Hall to incorporate SPAD arrays in view of Borowski. *Id.* at 57 (citing Ex. 1003 ¶¶ 189–190). Petitioner submits that “Hall acknowledges that in existing LiDAR systems, the ‘detection of return signals includes significant sources of measurement noise that are exacerbated as measurement ranges are extended,’ and that conventional solutions required ‘increasing laser pulse intensity.’” *Id.* (citing Ex 1008, 2:27–33). Petitioner argues that improvements are thus needed for “power management . . . while maintaining sufficiently high levels of imaging resolution and range.” *Id.* (citing Ex. 1008, 2:46–48). Petitioner asserts that Borowski teaches that SPADs can solve problems with light intensity because they “provide[] significant carrier amplification.” *Id.* (citing Ex. 1009 ¶ 35). Petitioner contends that Borowski further teaches that using a “cluster” of SPAD detector cells whose outputs are multiplexed and averaged is advantageous because the “programmed macro-cell . . . acts as the equivalent of a single ‘perfect’ SPAD having no recovery time.” *Id.* (citing Ex. 1009 ¶ 53). Petitioner argues that a person of ordinary skill in the art would have thus understood that using clusters of SPADs for LiDAR detection can improve detection at longer ranges and at lower light intensities. *Id.* (citing Ex. 1003 ¶¶ 189–190).

Petitioner further asserts that a person of ordinary skill in the art would have been motivated to modify Hall to incorporate an arrayed micro-optic (on the emitter side) and an aperture array (on the detector side) as taught by Spector. *Id.* (citing Ex. 1003 ¶ 191). Petitioner argues that Hall

acknowledges that there is a need to “avoid cross-talk” in LiDAR systems with multiple emitters. *Id.* (citing Ex. 1008, 9:13–25). Petitioner further submits that Spector teaches an arrayed micro-optic used to “project a two-dimensional array of light spots on a scene.” *Id.* at 57–58 (citing Ex. 1005, 3:1–14). Petitioner submits that Spector also teaches an aperture array that “establish[es] . . . individual optical detection sites.” *Id.* at 58 (citing Ex. 1005, 3:54–61). Petitioner argues that the array of isolated light spots generated by the arrayed micro-optic, in combination with the individual optical detection sites, in a one-to-one correspondence, reduce cross-talk and multipath signals. *Id.* (citing Ex. 1005, 6:12–15). Based on these disclosures in Hall and Spector, Petitioner argues that a person of ordinary skill in the art would have thus understood that applying Spector’s aperture array within Hall’s system would reduce cross-talk and associated errors, and improve the accuracy of the LiDAR system. *Id.* (citing Ex. 1003 ¶ 191). Petitioner argues that Spector’s system also provides additional advantages, such as permitting “smaller and/or simpler and less expensive scanning mechanisms.” *Id.* (citing Ex. 1005, 6:15–20).

b) Patent Owner’s Arguments

Patent Owner argues that Petitioner’s asserted motivations to combine Hall with Spector “contradict or are entirely unsupported by evidence presented in the petition.” Prelim. Resp. 32. With respect to Petitioner’s contentions that Spector’s techniques would reduce cross-talk, Patent Owner argues that Hall already discloses ways of eliminating cross-talk from its system, so Spector “add[s] nothing.” *Id.* Patent Owner submits that Hall identified two techniques for reducing cross talk. *Id.* at 32–33. First, Patent Owner notes that Hall discloses adjusting the delay time between one laser

firing a measurement pulse and the next laser firing a measurement pulse. *Id.* at 33 (citing Ex. 1008, 9:13–16). Patent Owner contends that Hall discloses that “there is no cross talk” if such adjustments are made. *Id.* (citing Ex. 1008, 9:16–17) (emphasis omitted). Second, Patent Owner submits that Hall also teaches, even if the delay time is not adjusted in the manner suggested, cross-talk can be avoided if there is sufficient spatial separation between the areas of the surrounding environment interrogated by each beam. *Id.* (citing Ex. 1008, 9:21–25). Patent Owner argues that Petitioner fails to analyze these disclosures of Hall, and because the proposed modifications to reduce cross-talk are redundant of the techniques disclosed in Hall, there is no motivation to combine the references. *Id.* at 32–33.

Patent Owner also contends that “Hall teaches away from systems like Spector.” *Id.* at 37. Patent Owner submits that Hall criticizes systems with single light sources, and, in particular, single light source systems that use a gimbal. *Id.* (citing Ex. 1008, 1:45–48, 1:55–63). Patent Owner argues that “Spector discloses exactly the sort of gimbaled system with a single light source taught away from by Hall.” *Id.* Patent Owner asserts that “[d]ue to Spector’s disclosure of the use of a single light source, there is strong evidence that a [person of ordinary skill in the art] would not have looked to Spector for elements to combine with Hall based on Hall’s teaching away from single light source systems.” *Id.* at 38. Patent Owner also argues that a person of ordinary skill in the art would not have looked to Spector because Spector discloses “using two-dimensional actuation to ‘achieve a broader field of view than a single sensor’—exactly what Hall teaches away from.” *Id.* at 38–39 (citing Ex. 1008, 1:55–57, 1:60–63).

Finally, Patent Owner argues that a person of ordinary skill in the art “would not have thought to consider the alleged apertures from Spector’s system—which scans in two planar dimensions—to be valuable in Hall’s system—which rotates in only one rotary dimension.” *Id.* at 41. Patent Owner asserts that “Spector’s “aperture array” is part of a system that faces in a single direction and continually scans through a scene by moving in horizontal (X-axis) and vertical (Y-axis) directions,” while “Hall discloses only horizontal scanning along a radial axis.” *Id.* at 41–42. Patent Owner contends that “the outcome of incorporating Spector’s “aperture array” into Hall’s rotating LIDAR system would look significantly different from Spector’s “complete scan” of a scene depicted in Spector’s Figure 9 reproduced above.” *Id.* at 42. Patent Owner argues that Spector teaches that a system using its type of aperture “must be paired with horizontal and vertical scanning,” because, without such scanning, “the system will detect incomplete information about a scene.” *Id.* at 45. Patent Owner concludes, therefore, “Spector explicitly taught away from such a use of its light spots and apertures—disclosing that each spot or aperture should be scanned “no more than the distance between adjacent spots.” *Id.* at 46 (citing Ex. 1005, 1:62–67).

c) Analysis

A motivation to combine may be found “explicitly or implicitly in market forces; design incentives; the ‘interrelated teachings of multiple patents’; ‘any need or problem known in the field of endeavor at the time of invention and addressed by the patent’; and the background knowledge, creativity, and common sense of the person of ordinary skill.” *ZUP, LLC v. Nash Mfg., Inc.*, 896 F.3d 1365, 1371 (Fed. Cir. 2018) (quoting *Plantronics*,

Inc. v. Aliph, Inc., 724 F.3d 1343, 1354 (Fed. Cir. 2013)). “The motivation-to-combine analysis is a flexible one.” *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1379 (Fed. Cir. 2023).

We find on the current record that Petitioner has shown sufficiently that there is a motivation to combine Hall, Borowski, and Spector. We note that Patent Owner does not dispute, at this time, that there is a motivation to combine Hall and Borowski. We have reviewed Petitioner’s contentions with respect to the combination of Hall and Borowski and find it sufficient. We focus our analysis on combination of Hall and Spector.

To begin with, we disagree with Patent Owner’s contentions that a person of ordinary skill would not have looked to Spector because Hall already solved the problem of cross-talk. *See* Prelim. Resp. 32–36. Although Patent Owner is correct that Hall offers some techniques to address the problem of cross-talk, Hall is clear that those methods are not the exclusive methods or universally solve the problem of cross-talk. For the first technique identified by Patent Owner, Hall states that “[i]n some embodiments, the delay time is set to be greater than the time of flight of the measurement pulse sequence to and from an object located at a maximum range of the LIDAR device. *In this manner*, there is no cross-talk among any of the sixteen multi-pulse illumination systems.” Ex. 1008, 9:13–17 (emphasis added). And for the second technique, Hall states

In some other embodiments, measurement pulse *may be* emitted from one pulsed illumination system before a measurement pulse emitted from another pulsed illumination system has had time to return to the LIDAR device. *In some of these embodiments*, care is taken to ensure that there is sufficient spatial separation between the areas of the surrounding environment [interrogated] by each beam to *avoid cross-talk*.”

Id. at 9:18–25 (emphasis added). Thus, Hall makes clear that these options for some embodiments, and that the technique works only if certain conditions are met. Thus, on this record, we do not agree that a person of ordinary skill would have been discouraged from looking at other techniques to address the cross-talk problem. Here, Hall discloses several, non-exclusive methods, that may address the cross-talk problem in certain circumstances, but we disagree with Patent Owner that would discourage a person of ordinary skill from looking to other methods of reducing cross-talk to improve Hall’s device. *See Allied Erecting and Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (“A given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.”).

Patent Owner’s argument that Hall teaches away from the combination with Spector because Spector is a single-light-source device with a gimbal is also not persuasive. *See* Prelim. Resp. 37–39. Here, Petitioner proposes using the apertures used in Spector’s LIDAR device in Hall’s device. *See* Pet. 64–65. Petitioner does not propose incorporating Spector’s light source or its gimbal. *Compare* Pet. 65 (showing annotated version of Figure 1 of Spector showing aperture), *with* Prelim. Resp. 38 (showing annotated version of Figure 1 of Spector highlighting light source.). We disagree with Patent Owner that a person of ordinary skill in the art would ignore everything taught in Spector, which also discloses a LIDAR system, because Hall might criticize one component of Spector. We note that Hall does not appear to criticize Spector’s apertures or the components Petitioner seeks to rely on. “A person of ordinary skill is also a person of ordinary creativity, not an automaton.” *KSR*, 550 U.S. at 421.

Indeed, “in many cases[,] a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle.” *Id.* at 420. Thus, we disagree that Hall teaches away from incorporating Spector’s apertures, as Patent Owner contends.

Finally, on this record, we do not agree with Patent Owner that Spector teaches away from the combination. *See* Prelim. Resp. 41–47. We note that much of Patent Owner’s argument is based on its assertions of how the modified device would operate. *See id.* at 43–44. However, these assertions are supported only by attorney argument, and entitled to little weight. *See Icon Health & Fitness, Inc. v. Strava, Inc.*, 849 F.3d 1034, 1043 (Fed. Cir. 2017) (“Attorney argument is not evidence.”). Moreover, we note that the proposed combination seeks to improve Hall’s device, not Spector’s, so it is unclear why a person of ordinary skill would necessarily compare the performance of Spector’s device versus the combined device. But even if we ignore these problems, we note that “[a] reference does not teach away, however, if it merely expresses a general preference for an alternative invention but does not ‘criticize, discredit, or otherwise discourage’ investigation into the invention claimed.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009). Spector’s discussion of obtaining a “complete scan of the scene,” Ex. 1005, 5:12, does not necessarily “criticize, discredit, or otherwise discourage,” anything less than “a complete scan of the scene.” Indeed, “[i]t’s not necessary to show that a combination is ‘the best option, only that it be *a suitable* option.’” *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 800 (Fed. Cir. 2021). At this stage, Patent Owner does not provide any evidence suggesting that Petitioner’s expert’s testimony is incorrect. *See* Ex. 1003 ¶¶ 185–195.

Accordingly, we find that Petitioner has shown sufficiently that a person of ordinary skill in the art would have been motivated to combine Hall and Spector.⁴ We note that this is only a preliminary finding and Patent Owner is free to develop further its various motivation to combine arguments by providing additional reasoning and evidence, and by cross examining Petitioner’s expert about his testimony.

2. *Claim 21*

a) *21(a): An optical system for performing distance measurements, the optical system comprising:*

Petitioner contends that, to the extent the preamble is limiting, Hall discloses limitation 21(a). Pet. 58 (citing Ex. 1003 ¶¶ 197–198). Petitioner notes that Hall teaches a “LIDAR based 3-D point cloud measuring system,” and that LiDAR systems “employ pulses of light to measure distance to an object.” *Id.* (citing Ex. 1008, 1:16–17, 1:21–23). At this time, Patent Owner does not dispute that Hall discloses the preamble. Accordingly, we find that, to the extent the preamble is limiting, Petitioner has shown sufficiently that Hall discloses the preamble.

b) *21(b): a stationary housing having a base, a top and an optically transparent window disposed between the base and the top and extending fully around a periphery of the stationary housing;*

Petitioner argues that Hall discloses limitation 21(b). Pet. 58–59 (citing Ex. 1003 ¶¶ 199–200). Petitioner asserts that Hall teaches that a 3-D LiDAR system 10 includes a “lower housing 11 and an upper housing 12 that includes a cylindrical shell element 13 constructed from a material that

⁴ We note that because we find Petitioner’s “cross-talk” rationale sufficient we do not address Petitioner’s “smaller and/or simpler and less expensive scanning mechanisms” rationale. *See* Pet. 58; Prelim. Resp. 35–36.

is transparent to infrared light.” *Id.* (citing Ex. 1008, 5:41–47). Petitioner contends that Figure 2 shows “the cylindrical shell element (i.e., the window) is disposed between the upper housing 11 and the lower housing 12, and, being cylindrical in shape, extends fully around the periphery of the housing.” *Id.* at 58–59 (citing Ex. 1008, Fig. 2). Petitioner further submits that a person of ordinary skill in the art “would have understood and it would have been obvious that Hall’s housing is stationary.” *Id.* at 59 (citing Ex. 1003 ¶ 200; Ex. 1008, 6:16–30, 6:48–7:6). At this time, Patent Owner does not dispute that Hall discloses this limitation. Accordingly, we find that, Petitioner has shown sufficiently that Hall discloses this limitation.

c) 21(c): a light ranging device disposed within the housing and comprising:

Petitioner contends that Hall discloses limitation 21(c). *See* Pet. 59–60 (citing Ex. 1003 ¶ 201). Petitioner submits that “Hall teaches that its system ‘perform[s] three dimensional LIDAR measurements’ to detect ‘objects . . . in the three dimensional environment.’” *Id.* at 59 (citing Ex. 1008, 2:52–54, 3:20–41). Petitioner also asserts that “Hall’s system includes within the housing a ‘light emission/collection engine’ with emitters, detectors, and associated optical and electronic components, all mounted to a rotating electronics board.” *Id.* at 60 (citing Ex. 1008, 6:10–7:6). At this time, Patent Owner does not dispute that Hall discloses this limitation. Accordingly, we find that, Petitioner has shown sufficiently that Hall discloses this limitation.

d) 21(d): a platform;

Petitioner argues that Hall discloses limitation 21(d). Pet. 60 (citing Ex. 1003 ¶¶ 202–203). Petitioner submits that Hall teaches that its light

emission/collection engine is “fixedly positioned” on a “rotating electronics board 111, and thus rotates about central axis 104.” *Id.* (citing Ex. 1008, 6:27–30, 6:48–7:6). At this time, Patent Owner does not dispute that Hall discloses this limitation. Accordingly, we find that, Petitioner has shown sufficiently that Hall discloses this limitation.

- e) *21(e): a light transmission module coupled to the platform and comprising a bulk transmitter optic and a plurality of optical emitters, each optical emitter in the plurality of optical emitters configured to generate and transmit pulses of radiation through the bulk transmitter optic and through the optically transparent window into a field external to the optical system; and*

Petitioner argues that Hall discloses limitation 21(e). *See* Pet. 61; Ex. 1003 ¶¶ 204–205. Petitioner contends that Hall teaches that its light emission/collection engine is mounted on the rotating electronics board. *Id.* (citing Ex. 1008, 6:27–30, 6:48–7:6). Petitioner asserts that the light emission/collection engine includes “an array of light emitting elements 114” (a plurality of optical emitters) and “a series of illumination optics 115” (bulk transmitter optic) that “collimate the emitted light into an array of beams” which are emitted from the 3-D LiDAR system into an external field. *Id.* (citing Ex. 1008, 6:31–38). Petitioner submits that the light emitting elements and illumination optics may be physically separated from the collection/detection elements and optic by intermediate circuit boards directly connected to the rotating electronics board, as shown in Figure 4 of Hall, forming a light transmission module and a light sensing module. *Id.* At this time, Patent Owner does not dispute that Hall discloses this limitation. Accordingly, we find that, Petitioner has shown sufficiently that Hall discloses this limitation.

- f) 21(f): a light sensing module coupled to the platform and comprising a bulk receiver optic, an aperture layer comprising a plurality of apertures separated by a stop region, a plurality of photosensors operable to detect photons emitted from the plurality of optical emitters and received through the bulk receiver optic after being reflected from surfaces within the field, and an optical filter disposed between the bulk receiver optic and the plurality of photosensors and configured to allow a band of radiation, including an operating wavelength of the plurality of optical emitters, to pass through the filter to the plurality of photosensors while blocking radiation outside the band from reaching the plurality of photosensors; and*

Petitioner contends that the combined teachings of Hall and Spector render limitation 21(f) obvious. *See* Pet. 62–65; Ex. 1003 ¶¶ 206–212. Petitioner submits that “Hall’s light emission/collection engine is mounted on the rotating electronics board and includes separate light emitting/illumination elements (light transmission module) and light collection/detection elements (light sensing module).” Pet. 62. Petitioner argues that the light collection/detection elements include “collection optics 116” (bulk receiver optic), which collects light reflected from objects in the environment and focus it onto an “array of detecting elements 113” (a plurality of photosensors). *Id.* (citing Ex. 1008, 6:41–47). Petitioner asserts that “Hall further discloses and renders obvious an optical filter disposed between the bulk receiver optic and the plurality of photosensors.” *Id.* (citing Ex. 1003 ¶¶ 208–209). Petitioner contends that Hall’s collection optics may include multiple lens elements 116A-D through which collected light is focused onto the array of detecting elements. *Id.* (citing Ex. 1008, Fig. 5, 7:7–13). Petitioner argues that “[i]nstead of functioning as a bulk

receiver optic, ‘one or more of the optical elements of collection optics 116’ may function as an optical filter by being ‘constructed from one or more materials that absorb light outside of . . . the wavelengths of light emitted by’ Hall’s emitters. *Id.* at 63 (citing Ex. 1008, 7:13–27). Petitioner asserts that a person of ordinary skill in the art “would have understood and it would have been obvious that range of wavelengths emitted by the emitters corresponds to a band of radiation, and that Hall’s filters would thus block light outside of that band from reaching the array of detecting elements.” *Id.* (citing Ex. 1003 ¶ 208). Petitioner also argues that a person of ordinary skill in the art “would have understood and it would have been obvious that if, as in one possible configuration according to Hall’s disclosure, element 116A functions as a bulk receiver optic, and elements 116B-D are constructed as optical filters, then the optical filters will be disposed between the bulk receiver optic (116A) and the light detecting elements.” *Id.* (citing Ex. 1003 ¶ 209). Petitioner acknowledges that “Hall does not expressly teach an aperture layer,” but contends that “it would have been obvious to [a person of ordinary skill in the art] to modify Hall to include an aperture layer in view of Spector.” *Id.* at 64 (citing Ex. 1003 ¶ 210).

Petitioner further contends that “Spector teaches an ‘aperture array 18 for defining the optical detection sites on [a] sensor array,’ including a ‘mask’ that defines ‘a plurality of transparent apertures arranged according to the two dimensional array [of detectors].’” *Id.* (citing Ex. 1005, Fig. 1; 3:32–59; Ex. 1010, 12, 19). Petitioner argues that “[a person of ordinary skill in the art] would have understood and it would have been obvious that Spector’s mask functions as a stop region that restricts the passage of light, particularly in view of Spector’s teaching that the plurality of apertures

‘limits visibility by each optical detection site to a single corresponding light spot.’” *Id.* at 65 (citing Ex. 1005, 3:59–61; Ex. 1010. at 13, 20; Ex. 1003 ¶ 212). At this time, other than its dispute that there is no motivation to combine the references discussed above, Patent Owner does not dispute that the combination of Hall and Specter discloses this limitation. Accordingly, we find that, Petitioner has shown sufficiently that the combination of Hall and Specter teaches this limitation.

g) 21(g): a motor disposed within the housing and operatively coupled to spin the platform and the light ranging device within the housing;

Petitioner argues that Hall discloses and renders obvious limitation 21(g). *See* Pet. 66; Ex. 1003 ¶¶ 213–214. Petitioner argues that Hall teaches that its rotating electronics board 111 is “configured to rotate with respect to stationary electronics board 111.” Pet. 66 (citing Ex. 1008, 6:18–22). Petitioner argues that a person of ordinary skill in the art “would have understood and it would have been obvious that a motor coupled to the rotating electronics board is used to effect this rotation.” *Id.* (citing Ex. 1003 ¶¶ 213–214; Ex. 1015, 5:5–7). At this time, Patent Owner does not dispute that Hall discloses this limitation. Accordingly, we find that, Petitioner has shown sufficiently that Hall accounts for this limitation.

h) 21(h): wherein: each photosensor in the plurality of photosensors comprises a plurality of single photon avalanche diodes (SPADs);

Petitioner asserts that the combined teachings of Hall and Borowski render limitation 21(h) obvious. *See* Pet. 66–67; Ex. 1003 ¶¶ 215–216. Petitioner submits that Hall discloses an “array of light detecting elements 113,” but does not specify the type of light detecting elements used or their

configuration within the array. Pet. 66 (citing Ex. 1008, 6:31–33). As discussed above, Petitioner contends it would have been obvious to a person of ordinary skill in the art to use an array of SPADs for each of Hall’s light detecting elements in view of Borowski. *Id.* (citing Ex. 1003 ¶ 215). Petitioner submits that Borowski teaches a “receiving part” in a LIDAR device that includes a “plurality of SPAD detector arrays.” *Id.* (citing Ex. 1009 ¶ 78). Borowski further teaches that each SPAD array “comprises a plurality of SPAD detector cells,” and that the plurality of SPAD cells is clustered into macro-cells, such that each cluster or macro cell functions as a photosensor, i.e., “the equivalent of a single ‘perfect’ SPAD having no recovery time.” *Id.* (citing Ex. 1009 ¶¶ 53, 171, 192). At this time, Patent Owner does not dispute that the combination of Hall and Borowski teaches this limitation. Accordingly, we find that, Petitioner has shown sufficiently that the combination of Hall and Borowski teaches this limitation.

i) 21(i): the plurality of apertures comprises at least first, second, third and fourth apertures;

Petitioner argues that the combination of Hall, Borowski, and Spector render limitation 21(i) obvious. *See* Pet. 67; Ex. 1003 ¶¶ 217–218. Petitioner contends that “[t]he Hall-Borowski-Spector combination includes an aperture array with a plurality of apertures, as taught by Spector,” and that “[i]n one exemplary embodiment, illustrated in Figure 4A, the aperture array includes a 4x4 grid of apertures, and thus comprises sixteen apertures.” *Id.* (citing Ex. 1005, Fig. 4A, Figs. 1, 5A–5B (showing other configurations); Ex. 1010, 19–20 (illustrating aperture arrays with more than four apertures)). At this time, other than its dispute that there is no motivation to combine the references discussed above, Patent Owner does not dispute that the combination of Hall, Borowski, and Spector teaches this

limitation. Accordingly, we find that, Petitioner has shown sufficiently that the combination of Hall, Borowski, and Spector teaches this limitation.

- j) *21(j): the plurality of photosensors comprises at least first, second, third and fourth photosensors; and the light sensing module includes a first optical path to the first photosensor through the first aperture, a second optical path to the second photosensor through the second aperture, a third optical path to the third photosensor through the third aperture, and a fourth optical path to the fourth photosensor through the fourth aperture.*

Petitioner argues that the combination of Hall, Borowski, and Spector render limitation 21(j) obvious. *See* Pet. 68; Ex. 1003 ¶¶ 219–220. Petitioner contends that the “Hall-Borowski-Spector combination includes an aperture array with at least four apertures, as taught by Spector, each of which corresponds to an optical detection site (i.e., a photosensor).” Pet. 68 (citing Ex. 1005, 3:57–59 (the “plurality of transparent apertures” is “arranged according to the two dimensional array” of optical sensors); Ex. 1010, 12–13). Petitioner notes that “Spector further teaches that each aperture ‘limit[s] visibility by each optical detection site to a single corresponding light spot’ from the light transmission module.” *Id.* (citing Ex. 1005, 2:4–6; Ex. 1010, 12 (“[A]n aperture is used to select imaged light at locations that correspond to the projected light.”)). Petitioner argues that a person of ordinary skill in the art “would have thus understood and it would have been obvious that each of the at least four apertures provides an optical path to its corresponding optical detection site through the aperture.” *Id.* (citing Ex. 1003 ¶¶ 219–220). At this time, other than its dispute that there is no motivation to combine the references discussed above, Patent Owner does not dispute that the combination of Hall, Borowski, and Spector

teaches this limitation. Accordingly, we find that, Petitioner has shown sufficiently that the combination of Hall, Borowski, and Spector teaches this limitation.

k) Summary as Claim 21

For all of the foregoing reasons, we find that Petitioner has shown a reasonable likelihood of success in demonstrating that a person of ordinary skill in the art would have had reason to combine the teachings of Hall, Borowski, and Spector, with a reasonable expectation of success in arriving at the subject matter claim 21 recites. As noted above, we also agree with Petitioner's arguments and evidence that the combination of Hall, Borowski, and Spector teach or suggest all of the limitations of claim 21. As a result, on the current record, Petitioner establishes, a reasonable likelihood of prevailing in showing that claim 21 would have been obvious over the combination of Hall, Borowski, and Spector.

3. Claims 23–33

Patent Owner does not raise any other separate arguments regarding claims 23–33 other than those we have considered above with respect to claim 21. *See* Prelim. Resp. 19–20, 32–47. We have reviewed Petitioner's contentions regarding claims 23–33, and determine that they show a reasonable likelihood Petitioner will prevail with respect to obviousness of claims 23–33 over Hall, Borowski, and Spector. *See* Pet. 68–76.

E. Alleged Ground of Unpatentability over Hall, Borowski, Spector, and Droz

Petitioner contends that claim 34 of the '405 patent is unpatentable under 35 U.S.C. § 103(a) as obvious over Hall, Borowski, Spector, and Droz. Pet. 76–78. Patent Owner offers counterarguments. Prelim. Resp.

32–47. Claim 34 depends from claim 26. Patent Owner relies on the arguments raised with respect to claims 21 and 26 raised regarding the challenge regarding Hall, Borowski, and Spector. For the reasons discussed above, we did not find those arguments persuasive. We have reviewed Petitioner’s contentions regarding claim 34 and determine that they show a reasonable likelihood Petitioner will prevail with respect to obviousness of claim 34 over Hall, Borowski, Spector, and Droz.

F. Remaining Grounds

Petitioner contends that claims 21, 23, 26–31, and 34 of the ’405 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Pacala and Droz. Pet. 13–37. Petitioner also contends that claims 24, 25, 32, and 33 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Pacala, Droz, and Villeneuve. *Id.* at 37–44. Patent Owner opposes. Prelim. Resp. 20–31. As we preliminarily conclude that Petitioner demonstrates a reasonable likelihood of prevailing on its challenge to claims 21 and 23–33 based on obviousness over Hall, Spector, and Borowski, we institute review on all challenged claims on all grounds set forth in the Petition, including Petitioner’s obviousness challenge to claims 21, 23, 26–31, and 34 based on Pacala and Droz and claims 24, 25, 32, and 33 based on Pacala, Droz, and Villeneuve. *See SAS*, 138 S. Ct. at 1354; *PGS*, 891 F.3d at 1360. However, we offer some preliminary thoughts on Patent Owner’s arguments regarding the Pacala-based grounds.

Patent Owner offers two main arguments. First, that Petitioner fails to show that the combination of Pacala and Droz accounts for the claimed “aperture” under Petitioner’s proposed construction from the (now terminated) ITC investigation. *See* Prelim. Resp. 20–25. Second, Patent

Owner argues that Petitioner’s motivation to combine Pacala and Droz is inadequate. *See id.* at 25–31. With respect to Patent Owner’s “aperture” arguments, we note that it is unclear whether Patent Owner contents that “aperture” should be construed under Petitioner’s proposed ITC construction. Instead, it appears that Patent Owner argues that Petitioner should have shown that the waveguides of Droz meet its ITC construction. *Id.* at 16–18, 20–25. We do not agree that Petitioner was bound by its prior proposed (and unadopted) claim construction. Moreover, our initial review of the arguments offered in the Preliminary Response cause us to doubt whether that construction is correct. *See id.* at 16–18. If the parties believe that “aperture” requires construction, they are encouraged to address it during the trial.

As for Patent Owner’s motivation to combine arguments, we do not find them to be persuasive at this time. We note they appear to rely on a number of contentions about the prior art (e.g., characterizing Droz’s waveguides as “heavy,” *id.* at 27, noting “[t]here appear to be at least eight different optoelectronic channels,” *id.* at 28–29, characterizing the waveguides as “costly, somewhat exotic materials”) that are supported only by attorney argument, and lack sufficient evidentiary support to be entitled to much weight. Thus, on the current record, we do not find them to be persuasive. Patent Owner is free to further develop the record on this issue during the trial.

IV. CONCLUSION

For the foregoing reasons, we conclude that the information presented in the Petition establishes a reasonable likelihood that Petitioner would prevail in showing that claims 21 and 23–34 of the ’405 patent are

unpatentable. At this preliminary stage, we have not made a final determination as to the patentability of the challenged claims or any underlying factual and legal issues.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 21 and 23–34 of the '405 patent is hereby instituted on all grounds of unpatentability set forth in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial commencing on the entry date of this decision.

IPR2023-01421
Patent 11,175,405 B2

FOR PETITIONER:

Jared W. Newton
James M. Glass
Nima Hefazi
QUINN EMANUEL URQUHART & SULLIVAN, LLP
jarednewton@quinnemanuel.com
jimglass@quinnemanuel.com
nimahefazi@quinnemanuel.com

FOR PATENT OWNER:

Phillip Morton
Eamonn Gardner
COOLEY LLP
pmorton@cooley.com
egardner@cooley.com