

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MERCEDES-BENZ USA, LLC,
Petitioner,

v.

YECHEZKAL EVAN SPERO,
Patent Owner.

IPR2023-01039
Patent 9,955,551 B2

Before JON M. JURGOVAN, JASON W. MELVIN, and
AARON W. MOORE, *Administrative Patent Judges*.

MELVIN, *Administrative Patent Judge*.

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

I. INTRODUCTION

Mercedes-Benz USA, LLC (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 8, 10–18, and 24–47 (“the challenged claims”) of U.S. Patent No. 9,955,551 B2 (Ex. 1001, “the ’551 patent”). Yechezkal Evan Spero (“Patent Owner”) filed a Preliminary Response. (Paper 7, “Prelim. Resp.”). As authorized, Petitioner filed a Preliminary Reply (Paper 8 (“Prelim. Reply”)), and Patent Owner filed a Preliminary Sur-Reply (Paper 9 (“Prelim. Sur-Reply”)). Pursuant to 35 U.S.C. § 314 and 37 C.F.R. § 42.4(a), we have authority to determine whether to institute review.

An *inter partes* review may not be instituted unless “the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). For the reasons set forth below, we conclude that Petitioner has shown a reasonable likelihood it will prevail in establishing the unpatentability of at least one challenged claim.

A. REAL PARTIES IN INTEREST

As real parties in interest, Petitioner identifies: Mercedes-Benz USA, LLC; Mercedes-Benz Group AG; Mercedes-Benz AG; and Mercedes-Benz Intellectual Property GmbH & Co. KG. Pet. 2. Patent Owner identifies Yechezkal Evan Spero and Torchlight Technologies LLC as the real parties in interest, noting that Torchlight is the exclusive licensee of the ’551 patent. Paper 4, 1 (Patent Owner’s Mandatory Notices).

B. RELATED MATTERS

The parties identify the following related federal district court litigations of the ’551 patent: *Torchlight Techs. LLC v. Daimler AG et al.*, Case No. 1:22-cv-

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00751 (D. Del.); *Torchlight Technologies LLC v. General Motors LLC et al.*, No. 1:22-cv-00752 (D. Del). Pet. 2–3; Paper 4, 1.

The parties identify the following PTAB *inter partes* reviews of the '551 patent: IPR2023-00315; IPR2023-00318; IPR2023-00336; IPR2023-01040; IPR2023-01225. Pet. 3; Paper 4, 2.¹ Patent Owner identifies pending Reissue Application 16/858,342. Paper 4, 1.

C. THE '551 PATENT

The '551 patent is titled “Detector Controlled Illuminating System” and relates to an “illuminating device” whereby “illumination intensity and spectrum” are varied to illuminate “areas according to the principles of correct lighting practice,” e.g., “adapt to ambient lighting, movement, visual tasks being performed, and environmental and personal conditions.” Ex. 1001, codes (54), (57). The specification generally describes a lighting device that “incorporates one or more discrete light sources and their ancillary optical and electrical control equipment in an integrated illuminating element.” *Id.* at 13:34–36. The combined unit is referred to as a Digital Lighting Fixture (DLF). *Id.* at 18:18–22.

The specification further describes transportation vehicle applications. *Id.* at 50:38–57:37. One such application involves a DLF headlamp device that includes a cluster of LEDs for flexible illumination. *Id.* at 50:50–58. With LEDs having a variety of aims, the headlamp’s light distribution pattern may be controlled based on a number of factors, including detected oncoming vehicles. *See id.* at 51:43–47, 52:59–65.

¹ Patent Owner further lists IPRs involving patents related to the '551 patent. Paper 4, 1–3.

D. CHALLENGED CLAIMS

Petitioner challenges claims 8, 10–18, and 24–47. *See* Pet. 5. Independent claim 8 is reproduced below, with additional formatting to distinguish limitations:

8. An illuminating device which provides light to meet an illumination requirement of an illuminated area in which visual activities are performed, where different sub-areas of the illuminated area need to be illuminated at a different intensity and/or at a different spectrum than another sub-area of the illuminated area, comprising:
 - a light fixture including a multiplicity of directional light sources including at least two directional light sources pointing in different directions thereby illuminating different sub-areas of the illuminated area,
the light fixture having movable structure for aiming the directional light sources mounted thereon in a defined direction;
 - a camera for obtaining images of the illuminated area functioning as a detector for at least one of (i) a light detector (ii) a spectrum detector, (iii) a motion detector, (iv) a measuring detector for sensing a geometry of the illuminated area, and (v) a detector for sensing at least one of work surfaces and road objects and at least one of vehicles and people;
 - a controller for adjusting a light intensity and a direction of each of the directional light sources;
 - a processor with
 - stored algorithms and data for identifying at least one of (i) tasks being carried out by people, (ii) location of people, (iii) frequency of area usage by people, (iv) traffic density in the illuminated area from the sensed geometry, (v) work surfaces, (vi) road objects, people and/or vehicles, and (vii) roadway surface luminance
 - any of which is used by said processor for determining illumination within the illuminated area using at least one of artificial intelligence, pattern recognition, video analytics, and look-up tables

wherein said processor, upon calculating the required illumination parameters according to best practice standards, directs the controller to adjust the directional light sources that illuminates the specific sub-areas to meet the illumination requirements of the visual activities.

Ex. 1001, 96:38–97:3. Claims 10–18 depend from claim 8, directly or indirectly.

Id. at 97:13–60. Claim 35 depends from claim 8, indirectly through claim 14.

Ex. 2014, 1185 (3:47–4:4).

Independent claim 24 is reproduced below:

24. An illuminating device having automatic control of light provided to an illuminated area comprising:

a structure for incorporating illuminating device elements,
wherein the structure comprises a motor vehicle;

a plurality of individually controllable LEDs incorporated in the structure via at least one headlamp mounted to the structure, each headlamp including at least one of the LEDs, the LEDs in communication with a power source;

electronic circuitry apparatus for the controlled powering of the LEDs and other of the illuminating device elements;

one or more processors;

one or more sensors, including one or more cameras, placed on the structure for detecting coordinate-specific information about the illuminated area, at least one of said cameras in communication with power, and in communication with at least one of the one or more processors;

a controller, including at least one of the one or more processors, integrated with the structure via mounting, in communication with the controlling power electronic circuitry apparatus, said controller arranged to process the information communicated from the cameras and to automatically control the light provided to the illuminated area; and

memory storing instructions that, when executed by one or more processors of the controller, enable the controller to:

determine coordinates corresponding to an other vehicle, based on the coordinate-specific information;
select a cluster of the LEDs that emit light toward at portion of the other vehicle based on the LEDs having emission aimings associated with the first coordinates; and
change emission of the selected cluster of LEDs relative to emission of other LEDs not included in the cluster to create headlamp illumination that preserves a first level of illumination illuminating past the other vehicle while preventing glare to a driver of the other vehicle.

Ex. 2014, 1184 (1:21–63).² Claims 25–31 depend from claim 24, directly or indirectly. *Id.* (1:64–2:41). Claim 32 is independent and recites limitations similar to those of claim 24. *Id.* at 1184–85 (2:42–3:19); *see* Pet. Appx. A. Claims 33, 34, and 36–39 depend from claim 32, directly or indirectly. *Id.* at 1185 (3:20–46, 4:5–19). Claim 40 is independent and recites limitations similar to those of claim 24. *Id.* at 1185–86 (4:20–5:5); *see* Pet. Appx. A. Claims 41–47 depend from claim 40, directly or indirectly. *Id.* at 1186 (5:6–6:23).

² Through *ex parte* reexamination, original claim 6 was canceled and new claims 24–87 issued in a Reexamination Certificate. Ex. 2014, 1184–90. A number of typographical errors were corrected through a Certificate of Correction. *Id.* at 1214–19.

E. PRIOR ART AND ASSERTED GROUNDS

This proceeding includes the following unpatentability grounds:

Claims Challenged	35 U.S.C. § ³	References/Basis
24–27, 29–31, 32–35, 37–39, 40–43, 45–47	102	Alden ⁴
24–27, 29–31, 32–35, 37–39, 40–43, 45–47	103	Alden
28, 36, 44	103	Alden, Kobayashi ⁵
8, 10–14	103	Alden, Kondo ⁶
15–18	103	Alden, Kondo, Stam ⁷

Pet. 5. Petitioner also relies on the Declaration of Dr. Nikolaos Papanikolopoulos. Ex. 1003.

II. ANALYSIS

A. DISCRETIONARY DENIAL

Patent Owner asserts that we should exercise our discretion to deny institution for two reasons. Prelim. Resp. 49–63.

1. Lack of particularity

First, Patent Owner contends that the Petition lacks particularity under 35 U.S.C. § 312(a)(3) because it improperly combines anticipation and obviousness

³ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284 (2011), effective March 16, 2013, amended the applicable statutes. Because the application from which the ’551 patent issued was filed before this date, the pre-AIA versions of §§ 102 and 103 apply.

⁴ US 2003/0137849 A1, filed Jan. 22, 2002 (Ex. 1005).

⁵ US 6,049,749, issued Apr. 11, 2000 (Ex. 1006).

⁶ US 2002/0057572 A1, published May 16, 2002 (Ex. 1007).

⁷ WO 2001/07538 A2, published Sept. 27, 2001 (Ex. 1008).

grounds based on Alden alone. *Id.* at 49–52. We do not agree that the Petition’s approach presents a problem or is hard to understand. As discussed below, we agree with Patent Owner that Petitioner has not adequately supported its obviousness contention based on Alden alone (*see infra* at 17 (§ II.D.2)), but that does not undermine the anticipation ground or make it difficult to understand. Accordingly, we do not agree with Patent Owner that the Petition warrants discretionary denial for lack of particularity.

2. Serial petitions

Patent Owner argues that we should exercise our discretion under 35 U.S.C. § 314(a) to deny institution under the factors considering serial petitions set forth in *General Plastic Industrial Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19, 15–16 (PTAB Sept. 6, 2017) (precedential). Prelim. Resp. 54–63. The ’551 patent was challenged by Volkswagen Group of America, Inc., in three prior IPR petitions. We instituted review in the first two proceedings and denied review in the third. IPR2023-00315, Paper 11 (instituting review of claims 24–55); IPR2023-00318, Paper 11 (instituting review of claims 56–87); IPR2023-00336, Paper 11 (denying institution for a petition challenging claims 7, 8, and 10–18). Contesting institution here, Patent Owner raises only the two instituted Volkswagen proceedings. Prelim. Resp. 53–54. We do not agree that this case warrants discretionary denial.

The first *General Plastic* factor considers whether the same petitioner previously challenged the same claims of the same patent. *General Plastic*, Paper 19, 16. Here, Patent Owner asserts that although Petitioner did not do so, we should consider Petitioner as having a substantial relationship to Volkswagen, which is also as a defendant in Patent Owner’s infringement suit. Prelim.

Resp. 54–59. In that regard, Patent Owner relies on *Valve Corp. v. Electronic Scripting Products, Inc.*, IPR2019-00062, Paper 11, 2 (PTAB April 12, 2019) (precedential). We do not agree, because *Valve* involved parties that were accused of infringement based on the same product. *Valve*, Paper 11, 9–10. Here, Patent Owner asserts that Petitioner is accused of infringing “based on the same type of headlight technology” (Prelim. Resp. 55), but that is insufficient. Patent Owner asserts that both parties’ accused headlights were “developed jointly with Hella KGaA Hueck & Co.” (*id.* at 56), but that also is an insufficient connection for us to consider two parties substantially related for purposes of discretionary denial. As Petitioner points out, it and VW are direct competitors, and they are accused of infringing based on two different products, not as a supplier and customer of a single product, as at issue in *Valve*. Prelim. Reply 1.

Additionally, although Patent Owner asserts that Petitioner and VW “have a history of coordinating serial IPR petitions against asserted patents” (Prelim. Resp. 56), the facts of each case are unique and we will not infer a motive from prior proceedings. Having considered Patent Owner’s arguments,⁸ we conclude that the first *General Plastic* factor weighs strongly against discretionary denial.

Factors 2 through 5 relate to Petitioner’s knowledge of its asserted art, knowledge of Patent Owner’s or the Board’s position on previously asserted art,

⁸ Patent Owner asserts further that we should follow *Shenzhen Silver Star Intelligent Tech. v. iRobot Corp.*, IPR2018-00761, Paper 15 at 16-17 (PTAB September 5, 2018), to apply a presumption that a petition should be denied when it is filed after a preliminary response or institution decision arising from an earlier-filed petition. Prelim. Resp. 55. Patent Owner does not acknowledge that the discussion it seeks to rely on comes from a concurrence, which is not the opinion of the Board. That opinion is not binding and we decline to adopt its approach.

and any explanation for the time between two petitions. *General Plastic*, Paper 19, 16. Because we determine that Petitioner did not previously challenge the challenged claims, those factors are substantially diminished. Even considering that Petitioner saw Patent Owner’s preliminary responses to Volkswagen’s petitions and the Board’s institution decisions, any roadmapping concern is substantially reduced in light of our decision to institute review for two prior petitions. *See* IPR2023-00315, Paper 11; IPR2023-00318, Paper 11. Patent Owner’s roadmapping contention relates to arguments it made in a preliminary response, but we concluded those arguments were not persuasive when instituting review. IPR2023-00315, Paper 11, 10–12; *see* Prelim. Resp. 60–61. In short, we do not agree with Patent Owner that the IPR2023-00315 institution decision gave Petitioner any reason to move away from Beam as a reference. Although Patent Owner raises other related IPRs, those decisions considered different claims and therefore do not show that Petitioner gained an advantage here. *See* Prelim. Resp. 61 (raising IPR2022-01586).

We have considered Patent Owner’s arguments based on *General Plastic* and conclude that this case does not warrant discretionary denial.

B. LEVEL OF ORDINARY SKILL IN THE ART

Petitioner asserts that an ordinarily skilled artisan “would have had an undergraduate degree in mechanical engineering, electrical engineering, automotive engineering, optical engineering, applied physics, computer science, or similar disciplines, along with two years of experience working with intelligent vehicle systems, automotive control systems, or lighting control systems.” Pet. 9 (citing Ex. 1003 ¶ 33). Patent Owner does not dispute that level of ordinary skill in

the art. Prelim. Resp. 6. We adopt the undisputed level of ordinary skill in the art for purposes of this decision.

C. CLAIM CONSTRUCTION

The parties agree that no express claim construction is required at this stage. Pet. 9; Prelim. Resp. 6. We agree with the parties and therefore do not further construe the claims for this decision. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those 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)).

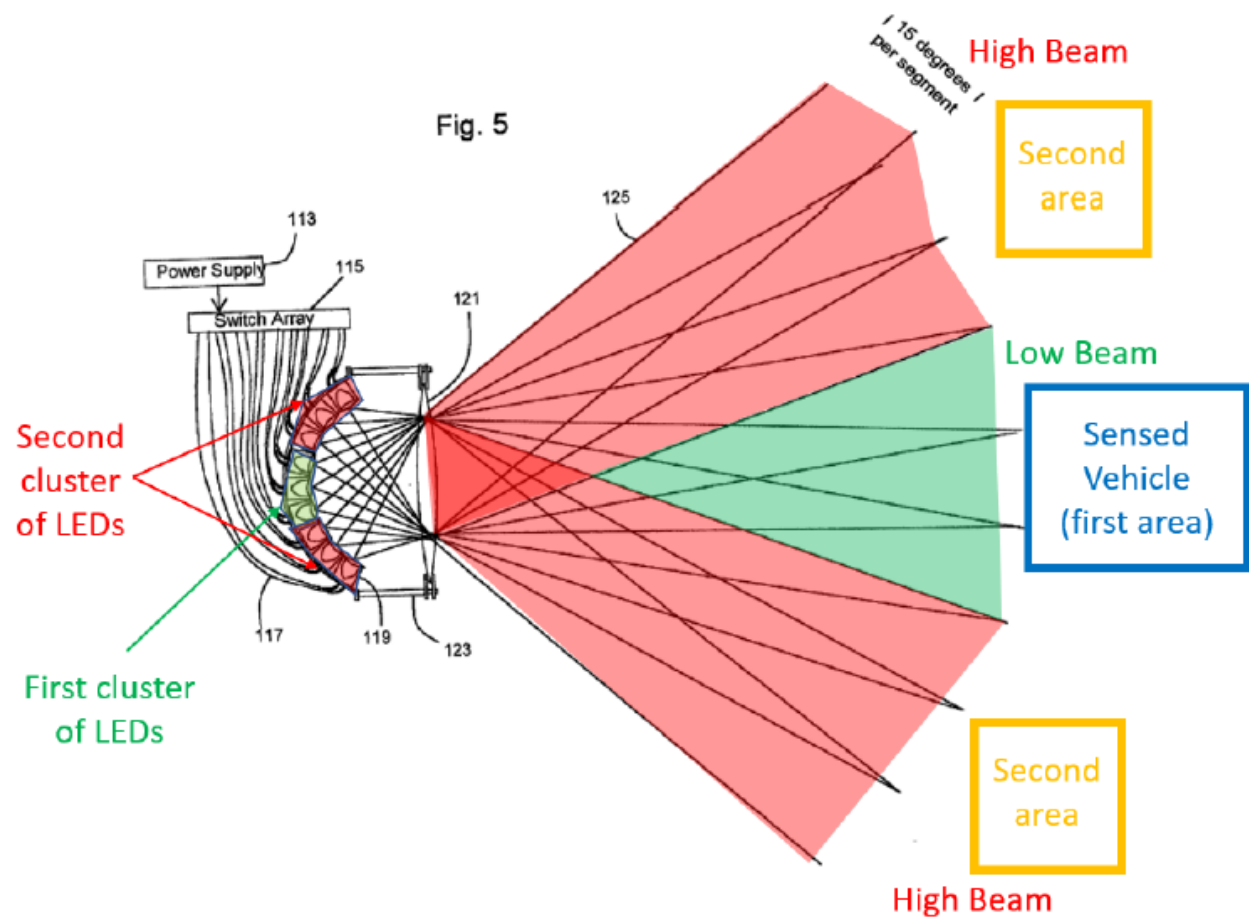
D. ANTICIPATION BY OR OBVIOUSNESS OVER ALDEN

Petitioner asserts that claims 24–27, 29–35, 37–43, and 45–47 are anticipated or rendered obvious over Alden. Pet. 10–62. Patent Owner disputes several aspects of Petitioner’s contentions relating to the independent claims. Prelim. Resp. 25–46.

1. Anticipation

a. *Claim 24*

As to claim 24, Patent Owner argues that Alden does not enable “creating headlamp illumination that preserves a first level of illumination illuminating past the other vehicle while preventing glare to a driver of another vehicle.” Prelim. Resp. 28. Patent Owner focuses on Petitioner’s annotation of Alden’s Figure 5, reproduced below:



Pet. 30; *see* Prelim. Resp. 29. Figure 5 illustrates Alden’s segmented headlight and controlling switch array in an embodiment using individual lighting elements 119 such as LEDs arranged on a curve along the focal point of lens 121 “such that the light from each lighting element goes into a specified portion (or portions) of the headlight distribution area.” Ex. 1005 ¶ 29. Petitioner’s annotations identify a portion of the distribution area where an oncoming vehicle is sensed, such that Alden’s system reduces the intensity of the lighting elements corresponding to the distribution area where the vehicle is sensed, while the lighting elements outside that area remain at full intensity. Pet. 29 (citing Ex. 1005 ¶¶ 5, 26–28).

Although Patent Owner contends that Alden does not disclose the operations purportedly shown by Petitioner’s annotations (Prelim. Resp. 29), we do not agree.

Alden describes a system that detects an oncoming vehicle and modifies the intensity of light directed toward that vehicle, while providing a second intensity to other areas. Ex. 1005 ¶ 25. Alden describes using a sensor to detect oncoming light in multiple sectors and then modulating a segmented light to control illumination in corresponding sectors. *Id.* ¶ 26. And Alden describes an embodiment of its segmented light using LEDs. *Id.* ¶ 29. Thus, Petitioner’s annotations appear to accurately represent Alden’s disclosures.

Patent Owner argues further that Petitioner’s depiction of an oncoming vehicle in Alden’s Figure 5 and elsewhere uses an inaccurate scale, with the width of a vehicle being less than the headlight. Prelim. Resp. 29–30. In Patent Owner’s view, a properly scaled vehicle “would have a width that spans all the beam segments illuminating the distribution area.” *Id.* at 30. That is, Patent Owner contends that Alden’s headlight illuminates an area no wider than a single vehicle. We do not agree. Our conclusion is supported by Alden’s other figures, which show headlight illumination spreading much wider than an oncoming vehicle. *See* Ex. 1005, Fig. 1, Fig. 2. Additionally, Alden indicates Figure 5 depicts an embodiment in which each lighting element provides 15 degrees of the overall illumination. *Id.* ¶ 39, Fig. 5. Using that example, each element’s illumination would spread about 39 feet at a distance of 150 feet.⁹ Thus, Patent Owner’s scale argument does not adequately consider Alden’s disclosures. When considering those disclosures, Petitioner’s contentions do not rely on an inaccurate scale.

Next, Patent Owner contends that Alden is “fatally ambiguous” and cannot support Petitioner’s contentions. Prelim. Resp. 31–33. Patent Owner recognizes that Alden discloses control circuits for a switch array to selectively dim portions

⁹ $150 \times \sin(15^\circ) = 38.8$

of a segmented headlight. *Id.* at 31 (citing Ex. 1005 ¶ 27). But, in Patent Owner’s view, those disclosures are made in the context of a different embodiment. *Id.* We do not agree. Alden discusses “elements of a segmented distribution illumination process” in connection with Figure 2. Ex. 1005 ¶ 26. The described process uses “Segmented Beam Headlight” 61 to differentially illuminate sectors of the illumination. *Id.* Alden’s description is generic to the specific headlight embodiment, and states that “[s]ome methods employed within 61 to segment light into independently controlled sectors are discussed later.” *Id.* Similarly, Figure 3 and its associated discussion provides “a more detailed illustration of the information flow, processes and architecture of the elements described in FIG. 2.” *Id.* ¶ 27, Fig. 3. Figure 3 depicts Segmented Headlights 83 and 85 generically, and the description refers to them without limiting the particular form of those headlights. *Id.* Thus, when Alden describes that Figure 5 “illustrates the segmented headlight means and controlling switch array in a first embodiment,” that does not describe an aspect disconnected from the components and operation depicted in Figures 2 or 3, but rather provides details regarding one embodiment of the segmented headlights included in Figures 2 and 3. *See id.* ¶ 29.

Patent Owner does not otherwise contest Petitioner’s anticipation challenge to claim 24. We have reviewed Petitioner’s contentions and evidence regarding anticipation of claim 24 and determine that they support institution.

b. Claim 32

Independent claim 32 recites a controller that can “create a beam of diminished illumination illuminating at least a portion of the at least one target with non-glaring illumination, created in a broader field of illumination having different intensity than the beam, the beam diminished in intensity relative to the

broader field of illumination illuminating at least above and on both sides of the beam.” Ex. 2014, 1185 (3:3–15). To account for the broader illumination field, Petitioner relies on Alden’s Figure 3, which shows that its sensors and control circuit operate using a two-dimensional array. Pet. 42 (annotating Ex. 1005, Fig. 3). Petitioner contends that Alden senses light from oncoming headlights and “uses this information to determine the spatial (horizontal and vertical) position of the oncoming vehicle” so that light from the segmented headlights may be dimmed only where the vehicle is sensed. *Id.*

Patent Owner argues that Alden does not disclose illumination varying vertically, in that Alden’s illumination may vary in the horizontal direction but remains constant for each vertical slice. Prelim. Resp. 36–37. We do not agree, because Alden’s Figure 3 plainly shows two-dimensional sensor arrays and control circuits. Ex. 1005, Fig. 3. While Alden’s Figure 5 shows a sectional view of one segmented-headlight embodiment, that does not restrict the embodiment as a whole to a one-dimensional array. Indeed, Alden’s disclosures contradict such a view. The Figure 5 embodiment that Petitioner relies on includes a switch array to control the individual lighting elements, with “[e]ach lighting element being independently controlled by a corresponding switch in an array of switches 115.” *Id.* ¶ 29. The Figure 6 embodiment includes a face-on view of the segmented headlight plainly showing a two-dimensional array, in addition to a sectional view similar to Figure 5’s. *Id.* at Fig. 6. And Alden describes that the Figure 6 embodiment uses “switch array similar to 115 and the process previously described herein.” *Id.* ¶ 30. Considering Alden’s description of its sensing-and-control circuit in connection with Figure 3, which illustrates a two-dimensional array, and its description of Figure 5’s segmented headlight as working with that approach, we find that Alden’s LED-based segmented headlight is capable of selective

illumination in two dimensions. *Id.* ¶¶ 27, 29, Figs. 3, 5. Further, Alden illustrates that it operates to dim illumination only around a sensed vehicle, providing non-dimmed illumination above the vehicle. *Id.* Fig. 3.

Although Patent Owner argues that Alden’s embodiments using a two-dimensional array are not compatible with its LED-based segmented headlight (Prelim. Resp. 40–41), we do not agree. As explained above, Alden’s disclosures are consistent with each other and are directed to a two-dimensional approach to sensing, control, and illumination.

In other respects, Patent Owner contests Petitioner’s anticipation challenge to claim 32 for the same reasons regarding claim 24. Those arguments are not persuasive for the reasons discussed above. We have reviewed Petitioner’s contentions and evidence regarding anticipation of claim 32 and determine that they support institution.

c. Claim 40

Independent claim 40 recites a device similar to claim 24’s, but able to detect at least two other vehicles, determine clusters of LEDs illuminating the two other vehicles, and decrease illumination intensity of both such clusters relative to illumination provided between the two vehicles. Ex. 2014, 1185–86 (4:20–5:5). Petitioner relies on Alden’s disclosure that its system can “detect the sector in which [oncoming vehicle] 33 (or any other vehicle) is located.” Ex. 1005 ¶ 25, Fig. 1. Alden states that it provides “specific means for sensing locations of vehicles and independent illumination control” and provides high-beam illumination “where no vehicle is detected.” *Id.*; *see also* Ex. 1003 ¶¶ 93–99.

Patent Owner contests Petitioner’s challenge, arguing that Alden does not disclose the claimed multiple-vehicle detection and selective illumination. Prelim.

Resp. 43–44. In Patent Owner’s view, Alden’s disclosures relate to detecting and accommodating multiple oncoming vehicles in succession, not simultaneously. *Id.* at 44 (citing Ex. 2001 ¶ 86). At most, Patent Owner’s argument establishes a factual dispute best resolved through trial.

In other respects, Patent Owner contests Petitioner’s anticipation challenge to claim 40 for the same reasons regarding claim 24. Those arguments are not persuasive for the reasons discussed above. We have reviewed Petitioner’s contentions and evidence regarding anticipation of claim 40 and determine that they support institution.

d. Dependent claims

At this stage, Patent Owner does not challenge Petitioner’s anticipation contentions regarding the dependent claims. We will evaluate the merits of those contentions during the instituted trial.

2. Obviousness

Petitioner presents its first ground as asserting “Alden Anticipates and Renders Obvious Claims 24–27, 29–35, 37–43, 45–47.” Pet. 11. As reflected in our description of asserted grounds above, we consider obviousness over Alden a separate ground from anticipation. *See supra* at 7 (§ I.E). Patent Owner submits that Petitioner fails to explain its obviousness contentions based on Alden alone with any level of detail. Prelim. Resp. 34. We agree. It does not appear that Petitioner has provided any basis on which to account for differences between Alden and the challenged claims based on Alden’s disclosures alone (as considered by a skilled artisan).

E. OBVIOUSNESS OVER ALDEN AND KONDO

1. Claim 8

Petitioner challenges independent claim 8 based on a combination of Alden and Kondo. Kondo is titled “Automatic Optical-Axis Adjusting Device for Automatically Adjusting Directions of Optical Axes of from Lights,” and is directed to vehicle lights mounted on a swivel such that they may be turned left or right as desired. Ex. 1007, codes (54), (57), ¶¶ 8, 16. Kondo’s device controls the swivel angle using actuators based on an angle determined in part on the vehicle’s steering angle. *Id.* ¶ 30–31.

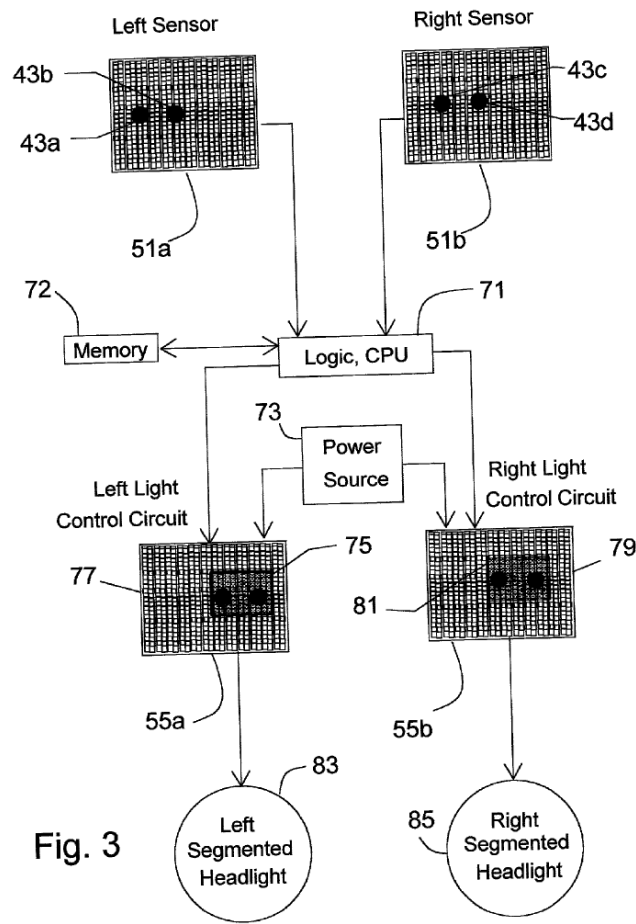
Petitioner reasons that skilled artisans would have modified Alden to place some LEDs on a moveable structure as taught by Kondo because that approach is a known alternative for re-directing light from headlamps—in other words, it was another way of providing functionality that Alden embraced. Pet. 72. Petitioner points out that using Kondo’s moveable structure was a way of “focusing light in the direction of a curve or turn to improve driver visibility.” *Id.* Petitioner further submits that Kondo provides a specific solution for Alden’s recognized desire to “direct light into the corners to maximize light there.” *Id.* at 73 (quoting Ex. 1005 ¶ 36). Thus, Petitioner contends that because Kondo “can accommodate sharp turns by using a swivel structure to adjust the physical direction of lights,” using its structure “would have given greater flexibility in controlling the directionality of emitted beams” through the ability “to sweep across a greater range in front of the vehicle than by using the fixed lighting elements and optical members disclosed in Alden.” *Id.*

Patent Owner challenges the reason for the combination, arguing that because Alden’s system uses a sensor separate from the headlight, making a portion of the headlight moveable would disassociate the headlight’s illumination

from the sensor field, such that the fixed sensor would not detect illumination from the moved headlight illumination. Prelim. Resp. 17–19. Thus, argues Patent Owner, the proposed combination “would render Alden inoperable or unsatisfactory for its intended purpose and thus an unsuitable option.” *Id.* at 19. We do not agree. A skilled artisan would configure the combined system such that Alden’s sensor could determine illumination over the full extent of a moveable headlight. Nothing about the systems described in Alden or Kondo suggests that doing so would pose a problem, and configuring the system in that manner is the only logical approach to the combined system.

Claim 8 recites a processor that can “determin[e] illumination within the illuminated area using at least one of artificial intelligence, pattern recognition, video analytics, and look-up tables.” Ex. 1001, 96:62–65. Petitioner contends that Alden discloses determining illumination using pattern recognition because its CPU received information from sensors regarding patterns of sensed light. Pet. 76–78. In particular, Alden discloses that its sensor “detects the two headlights” of an oncoming vehicle when “[e]lectrons corresponding to the position and intensity of light are categorized by a logic and CPU 71 and stored in a memory 72.” Ex. 1005 ¶ 27; *accord id.* ¶ 44. The CPU makes “assumptions about the space that may potentially be occupied by the drive of the sensed vehicle” and identifies an area of the segmented headlight to dim. *Id.* Part of that process includes storing a map of sensed light. *Id.* ¶ 28.

Patent Owner contends that the preceding disclosures do not amount to “pattern recognition.” Prelim. Resp. 21–24. In Patent Owner’s view, Alden simply dims any area in which light is detected over a certain threshold. *Id.* at 22. We do not agree. Alden’s Figure 3 is reproduced below:



Ex. 1005, Fig. 3. Figure 3 depicts the information flow, process, and architecture of Alden’s system. *Id.* ¶ 27. It shows sensors 51a and 51b, providing information to logic and CPU 71, which provides information to light control circuits 55a and 55b, which in turn provide information to segmented headlights 83 and 85. *Id.* Figure 3 depicts detecting two spots from an oncoming vehicle, causing logic and CPU to create areas 75 and 79 in the control circuit in which light from the segmented headlights will be dimmed. *Id.* Notably, the dimmed areas are “significantly larger than the headlight dots that were initially received . . . because the CPU has made assumptions about the space that may potentially be occupied by the driver of the sensed vehicle.” *Id.*

Because Figure 3 and the associated description support that Alden detects two spots of light, then interprets those two lights as an oncoming vehicle, and uses that determination to control the size of a dimmed area corresponding to the vehicle, we agree with Petitioner that Alden discloses claim 8's pattern-recognition limitation.

2. Objective evidence of nonobviousness

Patent Owner submits that, during reexamination of the '551 patent, "Patent Owner provided detailed objective evidence of nonobviousness directed to the Challenged Claims, including nexus proofs." Prelim. Resp. 46 (citing Ex. 2014, 67–83). Patent Owner faults Petitioner for not addressing that evidence in the Petition. *Id.*

As an initial matter, Patent Owner's asserted evidence does not expressly consider claim 8, as that claim was not part of the reexamination. Ex. 2014, 1184 (1:18) (indicating claim 8 was not reexamined). Thus, we question whether Patent Owner's asserted evidence could establish the required nexus. Additionally, evidence of nonobviousness involves a number of factual determinations that are best resolved through trial. Thus, we conclude that the present record does not support denying institution here.

3. Summary

Patent Owner does not otherwise contest Petitioner's obviousness challenge to claim 8. We have reviewed Petitioner's contentions and evidence regarding obviousness of claim 8 and determine that they support institution.

4. Dependent claims

At this stage, Patent Owner does not challenge Petitioner's contentions regarding the dependent claims. We will evaluate the merits of those contentions during the instituted trial.

F. OBVIOUSNESS OVER ALDEN, KONDO, AND STAM

For claims 15–18, which depend from claim 8, directly or indirectly, Petitioner asserts that Stam or Alden discloses the additionally recited limitations. Pet. 85–89. Stam discloses a system for controlling exterior vehicle lights. Ex. 1008, codes (54), (57), Fig. 11. Stam's system uses information from sensors including an imaging sensor and controls exterior lights such as fog lamps. *Id.* at 2:28–5:23, 25:4–5, 27:14–17, 63:15–16. Petitioner reasons that skilled artisans had reason to use Stam's teachings so that the same sensor used for headlights—Alden's camera—would detect conditions such as fog and control other exterior lights based on those conditions. Pet. 86–87.

At this stage, Patent Owner does not challenge Petitioner's contentions for claims 15–18. We will evaluate the merits of those contentions during the instituted trial.

III. CONCLUSION

For the reasons discussed above, we conclude Petitioner has shown a reasonable likelihood of prevailing with respect to at least one claim. We have evaluated all of the parties' submissions and determine that the record supports institution.

IV. ORDER

Accordingly, it is

ORDERED that, pursuant to 35 U.S.C. § 314(a), *inter partes* review of claims 8, 10–18, and 24–47 of the '551 patent is instituted on the grounds 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.

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