

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VOLKSWAGEN GROUP OF AMERICA, INC.,
Petitioner

v.

YECHEZKAL EVAN SPERO,
Patent Owner.

IPR2023-00197
Patent 10,894,503 B2

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

MOORE, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background

Volkswagen Group of America, Inc. (“Petitioner”) filed a Petition requesting *inter partes* review of claims 20–23, 24, 25, 59–62, 63, and 64 of U.S. Patent No. 10,894,503 B2 (Ex. 1001, “the ’503 patent”). Paper 1 (“Pet.”). Yechezkal Evan Spero (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”).

We may institute an *inter partes* review if “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) (2018).

For the reasons provided below, and based on the record as it now stands, we determine that Petitioner has demonstrated a reasonable likelihood that it will prevail in showing the unpatentability of at least one challenged claim. Accordingly, we institute *inter partes* review.

B. Related Proceedings

Petitioner identifies one civil action, *Torchlight Techs. LLC v. Daimler AG et al.*, No. 1:22-cv-00751 (D. Del.), as a related matter. *See* Pet. 129. Petitioner also identifies U.S. Patent Nos. 9,955,551 and 8,100,552 as having issued from parent applications, and U.S. Patent No. 11,208,029, as having issued from a child application. *See id.* at 130. Petitioner filed a petition for *inter partes* review of the ’029 patent, which we instituted in May 24, 2023.

Patent Owner identifies two civil actions in which the ’503 patent has been asserted, *Torchlight Techs. LLC v. Daimler AG et al.*, No. 1:22-cv-00751 (D. Del.), and *Torchlight Techs. LLC v. General Motors LLC et al.*, No. 1:22-cv-00751 (D. Del.), both of which are pending. *See* Paper 4, 1. Patent Owner also identifies two related *inter partes* reviews, *Volkswagen*

Group of America, Inc. v. Yechezkal Evan Spero, IPR2023-00328 and *Volkswagen Group of America, Inc. v. Yechezkal Evan Spero*, IPR2023-00335. *See id.* at 1–2. Patent Owner additionally identifies seven other Patent Office proceedings concerning related patents. *See id.* at 2.

C. The '503 Patent

The '503 patent is titled “Detector Controlled Headlight System” and is directed to “[a]n automated headlight system for vehicles [that] replaces the high and low beam with a continuum of beam patterns, with further variable spatial distribution of intensities and color spectrum.” Ex. 1001, Abstract. The embodiment that corresponds to the challenged claims is depicted in Figure 15, reproduced in part below:

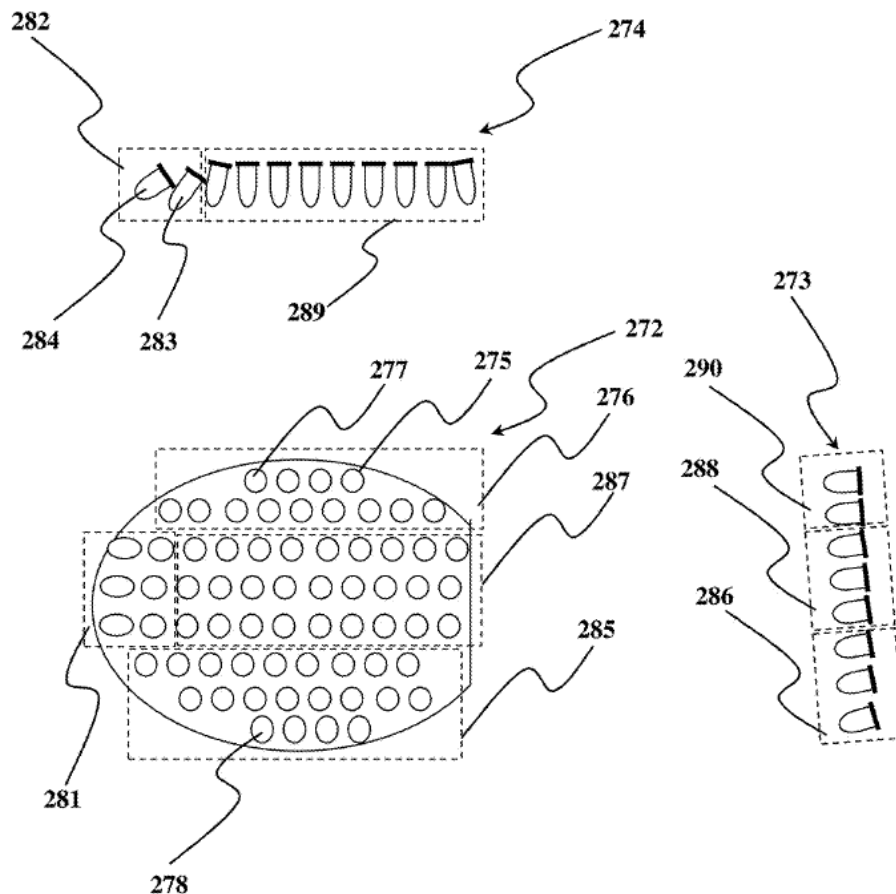


Figure 15 shows a “multiple light-source headlamp.” Ex. 1001, 15:64.

The figure depicts “a headlamp 270 of a land, sea or air vehicle” . . . in front view 272, side view of a section 273 and top view of a section 274.”

Ex. 1001, 53:17–19.

A solid-state light source, “such as an LED 275 with [a] specific location within the cluster 276 has a specific spatial light distribution, color wavelength and aiming relative to the vehicle, such as straight ahead, and or downwards and or off towards the right or left.” Ex. 1001, 53:19–23.

Different LED 277, which is “at a second location within the same cluster[,] may have a similar or dissimilar aiming, wavelength and spatial light distribution.” *Id.* at 53:19–32.

The patent explains that, because drivers may find yellow colored headlamps less offending than blueish colors, a controller that “receives traffic data from sensors” can “shift wavelength specific radiant power contributions of SLSs such that the resultant on the CIE chromacity diagram would be yellowish” but that if “there is no car immediately ahead or oncoming traffic,” then the controller can shift the color to “bluish white, allowing the driver to better ascertain road conditions further up ahead.” Ex. 1001, 53:53–62.

Claims 20 and 59 are independent and are directed to vehicle headlight systems. Claim 20 is reproduced in full below:

20. A vehicle headlight system, comprising:

one or more headlamps affixed to a vehicle, each headlamp including at least three directional light sources aimed at different angles relative to the vehicle, the light sources configured to have one or more controllable light characteristics, wherein a first light source of the more than one light sources at a first angle is less visually disturbing to traffic than a second light source of the more than one light sources aimed at a second angle, different from the first angle;

control circuitry configured to adjust the at least one light characteristic of at least one of the directional light sources;

one or more sensors configured to sense information defined as pertinent to determining illumination output from the one or more headlamps and communicating the sensed information to a processor as sensor data;

the processor, in communication with at least the sensors and the control circuitry, configured to:

process the sensor data to determine, within a field-of-view, at least a first subsection including a detected vehicle and at least a second subsection not including the detected vehicle,

determine optimal use of the differently aimed directional light sources to maximize vehicle operator visibility in at least the second subsection, while minimizing a disturbing effect, resulting from the illumination output, on the vision of other traffic in at least the first subsection, and

direct the control circuitry to adjust the directional light sources to achieve the determined optimal use.

D. Asserted Grounds of Unpatentability

Petitioner’s challenge raises the following grounds:

Claims Challenged	Basis	References
20, 24, 25	§ 103	Beam, ¹ Thominet ²
59, 63, 64	§ 103	Beam, Thominet, Stam ³
21–23	§ 103	Beam, Thominet, Kobayashi ⁴
60–62	§ 103	Beam, Thominet, Stam, Kobayashi
20, 24, 25, 59, 63, 64	§ 103	Karlsson, ⁵ Harbers ⁶
21–23, 60–62	§ 103	Karlsson, Harbers, Gotou ⁷

Petitioner also relies on Declaration of Jianzhong Jiao, Ph.D., filed as Exhibit 1003.

II. ANALYSIS

A. Level of Ordinary Skill in the Art

Petitioner contends that a person of ordinary skill in the art at the time of the alleged invention “would have had a bachelor’s degree (B.S.) in mechanical engineering, electrical engineering, optical engineering, applied physics, or an equivalent field, as well as at least 2 years of industry

¹ U.S. Patent No. 6,144,158 (Exhibit 1005).

² U.S. Patent App. Pub. No. 2001/0019486 A1 (Exhibit 1006).

³ PCT Patent App. Pub. No. WO 01/70538 (Exhibit 1007).

⁴ U.S. Patent No. 6,049,749 (Exhibit 1008).

⁵ PCT Patent App. Pub. No. WO 98,54030 (Exhibit 1010).

⁶ PCT Patent App. Pub. No. WO 01/01038 (Exhibit 1011).

⁷ U.S. Patent No. 5,588,733 (Exhibit 1012).

experience in the area of automotive lighting and lighting-control systems” and “may work as part of a team, for example, with computer engineers to integrate, program, etc., controllers and various control inputs to affect control of a given light source.” Pet. 9 (citing Ex. 1003 ¶¶ 42–44).

Patent Owner asserts that a person of ordinary skill in the art “would have had a Master of Science Degree (or a similar technical Master Degree, or higher degree) in an academic area emphasizing electrical engineering, computer engineering, or computer science with experience or education in optics and imaging systems or, alternatively, a Bachelor’s Degree (or higher degree) in an academic area emphasizing electrical, computer engineering or computer science and having two or more years of experience in the field of optical and imaging systems.” Prelim. Resp. 9–10 (citing Ex. 2001 ¶¶ 28–30).

For purposes of this analysis, we adopt Petitioner’s proposal, which we find generally consistent with the disclosures of the ’503 patent, except that we omit the qualifier “at least” and set the level of experience at two years. Petitioner’s use of the qualifier “at least two years” introduces ambiguity and may encompass skill levels beyond ordinary. If Patent Owner believes that use of its proposal instead of Petitioner’s as modified would affect the analysis, that should be addressed during the trial.

B. Claim Construction

We construe claims using the standard that would be applied in a civil action under 35 U.S.C. § 282(b), giving terms their ordinary and customary meaning to one of ordinary skill in the art in view of the specification and prosecution history. *See* 37 C.F.R. § 42.100(b).

Petitioner discusses Patent Owner’s assertion, made during prosecution of a different patent, that “light source” should mean “individual LED” but

asserts that “the applied references cover Patent Owner’s proposed construction.” *See* Pet. 10–11. Petitioner further states that it “does not believe any other claim terms require specific construction and should receive their plain and ordinary meaning, in the context of the ’503 patent specification.” *Id.* at 11. For its part, Patent Owner asserts that “[n]o claim construction is necessary to deny institution because Patent Owner’s arguments for denial do not hinge on the outcome of an actual controversy about claim interpretation.” Prelim. Resp. 10.

We do not agree that we do not need to engage in any claim construction at this time, because some of the arguments being made depend on the meaning of “light source.” On the current record we will interpret that term as the Specification appears to define it: “any system that is capable of receiving an electrical signal and producing light in response to the signal.” Ex. 1001, 17:7–10 (“As used herein, the term ‘light source’, LED or ‘solid state light source’ means any system that is capable of receiving an electrical signal and producing light in response to the signal.”). The Specification further explains that “light source” includes “light emitting diodes of all types, light emitting polymers, semiconductor dies that produce or emanate light in response to current, organic LEDs, electroluminescent strips, and other such systems,” as well as “[i]ncandescent and discharge light sources.” *Id.* at 17:10–15.

We find that no further express claim construction is necessary to resolve the institution question. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (explaining that construction is needed only for terms that are in dispute, and only as necessary to resolve the controversy).

C. Patentability Analysis

A claim is unpatentable under 35 U.S.C. § 103 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 to a person having ordinary skill in the art to which said subject matter pertains. *See 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 skill in the art; and (4) where in evidence, so-called secondary considerations, including commercial success, long-felt but unsolved needs, failure of others, and unexpected results. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Petitioner argues that independent claim 20 and dependent claims 24 and 25 would have been obvious in view of Beam and Thominet, adds Stam for claim independent 59 and dependent claims 63 and 64, and adds Kobayashi for dependent claims 21–23 and 60–62. *See* Pet. 4, 23–76. Petitioner also argues that claims 20, 24, 25, 59, 63, and 64 would have been obvious in view of Karlsson and Harbers, and adds Gotou for dependent claims 21–23 and 60–62. *See* Pet. 76–126.

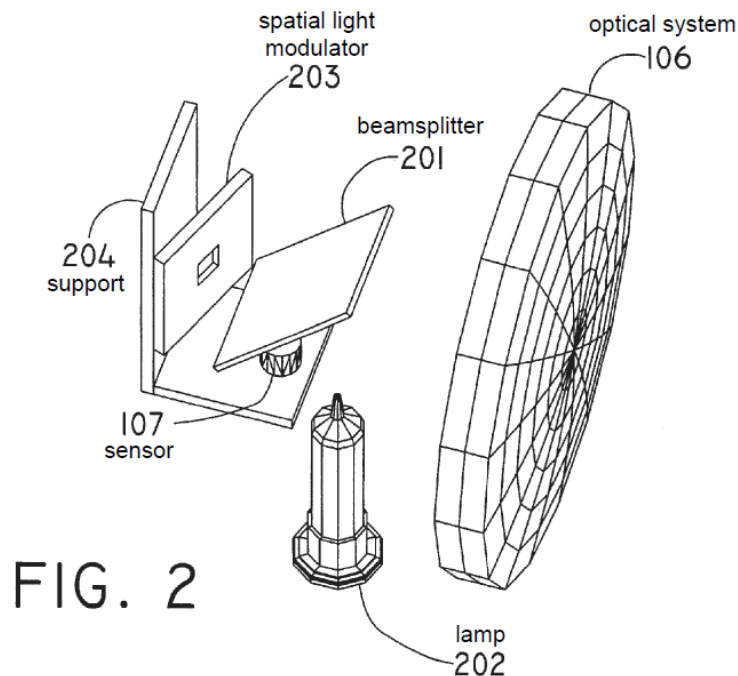
For the independent claims, Petitioner asserts that the base references (Beam or Karlsson) disclose all of the features of the claims, including the differently angled light sources and the technique of sensing oncoming headlights and dimming the light projected in the direction of the oncoming vehicle. Petitioner then adds the secondary references (Thominet or Harbers)

in the event we determine that the primary reference does not disclose the differently angled light sources. *See* Pet. 25, 76–77.⁸

We agree that both primary references disclose the headlight sensing and beam dimming technique, but find that neither Beam nor Karlsson describes differently angled light sources.

1. Angled Light Sources in the Primary References

Beam discloses a first embodiment, illustrated in Figure 2, that uses a lamp 202, a spatial light modulator 203, and beam splitter 201:



Beam’s Figure 2 “illustrates the component layout of an Automatic Beam Control system.” Ex. 1005, 3:56–57.

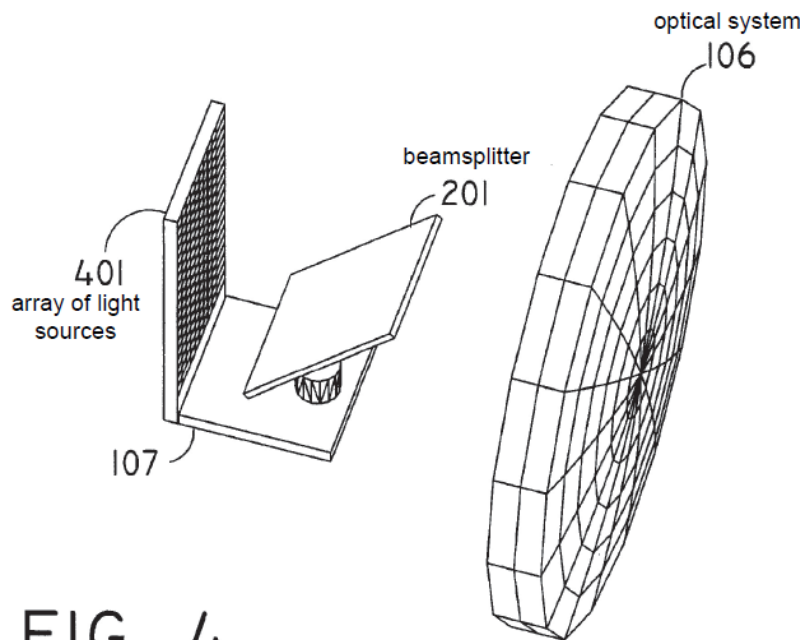
Beam explains that “[r]ays from a lamp 202 fall on the surface of a spatial light modulator 203 . . . where they are either reflected through or blanked (attenuated by being either absorbed or deflected to an absorbing

⁸ Stam is included for claim 59 in the event Beam does not disclose that “the illumination aimed at the first subsection substantially result[s] in light below a first predefined illuminance in the first subsection.” *See* Pet. 51–52.

surface)” and “[i]f reflected, they pass through beamsplitter 201 and out optical system 106.” Ex. 1005, 4:35–41. Beam states that this system “produce[s] an overall beam pattern comprising many . . . individual narrow-angle microbeams of light” and that “[t]he angular position or attenuation of each of these microbeams is independently set.” *Id.* at 4:42–48.

Petitioner asserts that “[e]ach microbeam is a directional ‘source,’” having its own independent *angular* position (angle/aiming), that combines to form the headlamp beam; so Beam’s lamp 202 and SLM 203 . . . form at least three directional light sources having different angles/aimings.” Pet. 23–24. We do not agree with Petitioners’ analysis because we find that the “microbeams” are the light itself, not the light *source*, as we have construed that term. *See* Section II.B. We find that Beam’s Figure 2 embodiment has just one light source (lamp 202) and, thus, does not meet the different angles limitation.

Beam also discloses a second embodiment, illustrated in Figure 4 below with the components labeled, in which “the lamp 202 and spatial light modulator 203 are replaced by an array of light sources 401 which are individually controlled” (Ex. 1005, 5:4–6):



Beam’s Figure 4 shows “the light source and the spatial light modulator [of Beam’s Figure 2] replaced by an array of individually controlled light sources.” Ex. 1005, 3:63–64.

Beam explains that the “array could be implemented a number of ways: it could be an addressable matrix of lasers; it could be an array of incandescent filaments; or it could be some other similar arrangement of emitters.” Ex. 1005, 5:6–9. A controller uses signals received from the scene to “determine the size and position of the light emitters to be dimmed” and “[t]he output of the active emitters is projected through optical system 106.” *Id.* at 13–16.

Petitioner asserts that, in this embodiment, “[e]ach light source of the array has its own independent angular position (angle/aiming), that combines to form the headlamp beam; so Beam’s array of light sources 401 form at least three directional light sources having different angles/aimings.” Pet. 24 (citing Ex. 1005, 3:61–64, 4:26–59, 5:3–16, Figs. 2, 4–6, 8:4–17; Ex. 1003 ¶ 119). We, however, find nothing in the cited portions of Beam, or in the

Jiao Declaration (which simply parrots the Petition), to suggest that the individual light sources in array 401 of Figure 4 are aimed at different angles. Most of the material cited by Petitioner, including the “angular position” language, is describing the Beam’s Figure 2 embodiment, not the Figure 4 embodiment.

For these reasons, we conclude that Beam does not disclose different light sources aimed at different angles.

Karlsson describes a lighting device with a controllable lighting pattern depicted in Figure 3, which is annotated and reproduced below:

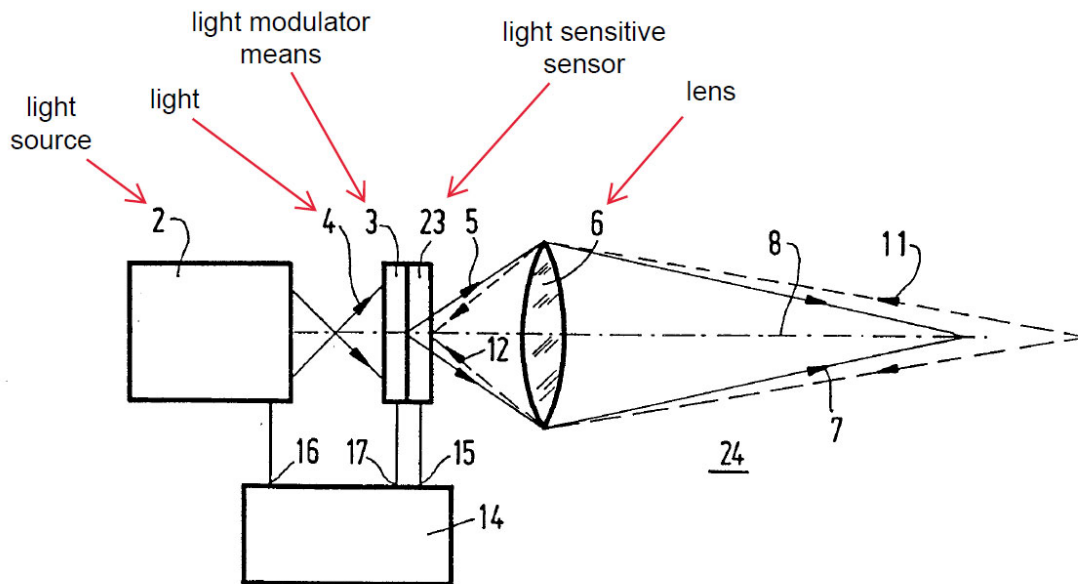


FIG. 3

Karlsson’s Figure 3 shows an embodiment with a light sensitive sensor. See Ex. 1010, 7:10–11.

This drawing shows a light source 2 that projects light 4 through a light modulator means 3, a light sensitive sensor 23, and a lens 6 to form a light beam 7. This arrangement “enables the combined use of a single optical system both for forming the light beam 7 to be emitted and for detecting

ambient light, due to the intermittently control of the lighting means 2, 3, and of the light-sensitive sensor 23, if desired, such that one or the other can be controlled to be light transmittive or light blocking.” Ex. 1010, 11:19–23.

Petitioner argues that Karlsson discloses directional light sources as follows:

Karlsson discloses “spotlight beams 34 can be . . . a *grid of separate light sources*, such as *LEDs* . . . controlled either *individually* or in *groups* . . . [and] may also be made up of . . . *light modulator means*” and “*light modulator means 3* advantageously can be switched to . . . *given directions*.”

Pet. 77 (quoting Ex. 1010, 11:25–28; 14:1–9).

Petitioner’s argument mischaracterizes the quoted language, using ellipses to flip the meaning. The full passage from page 11 is reproduced below, with the selectively quoted language regarding direction in bold italics and omitted language underlined:

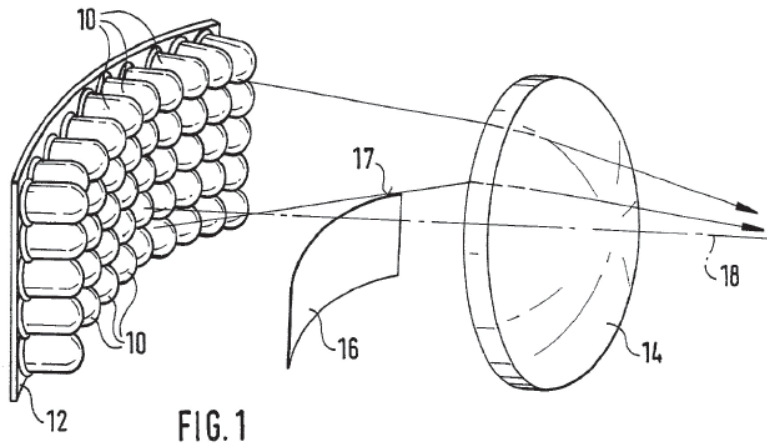
The lighting device according to the invention advantageously enables the combined use of a single optical system both for forming the light beam 7 to be emitted and for detecting ambient light, due to the intermittently control of the lighting means 2, 3, and of the light-sensitive sensor 23, if desired, such that one or the other can be controlled to be light transmittive or light blocking, dependent on the relative position of the light modulator means 3 and the sensor 23 as well as their typical characteristics. If the light modulator means 3 are arranged to receive incident light in front of the sensor 23, the ***light modulator means 3 advantageously can be switched to*** detect light by the sensor 23 from a given direction or *given directions*.

Ex. 1010, 11:18–28.

Read in context, the quoted language is referring to the light modulator means ***detecting*** light ***from*** different directions, not projecting light in different directions. Petitioner thus has not shown that Karlsson discloses different light sources aimed at different angles.

2. *Angled Light Sources in the Secondary References*

We find that Thominet *does* disclose an embodiment with light sources arranged at different angles, depicted clearly in its Figure 1:



Thominet’s Figure 1 shows “an illumination device for a vehicle in a schematic representation.” Ex. 1006 ¶ 10.

This drawing shows a number of “semiconductor light sources 10” that, by virtue of being mounted on a curved substrate, are angled in different directions. Thominet explains that the light sources “can be arranged approximately in one plane, or can be distributed over a concavely curved surface or a stepped surface.” Ex. 1006 ¶ 18. “[A]n optically active element 14 is arranged and formed as a collecting lens” through which the light emitted by the light sources passes. *Id.* Thominet further describes independently actuating different regions of the light sources to produce different lighting patterns, including asymmetrical low beams, high beams, and side-oriented beams for curves. *See id.* ¶¶ 20–26.

Similar to Thominet, Harbers discloses a vehicle headlight with light sources arranged at different angles, explaining that its “array of optoelectronic elements . . . does not have to be provided on a flat substrate” and “may alternatively be provided on a curved substrate.” Ex. 1011,

7:27–29. The reference states that “[t]he shape of the substrate on which the array of opto-electronic elements . . . is provided is determined to a substantial degree by the desired direction of the light beams emitted by the various opto-electronic elements.” *Id.* at 29–32.

3. *Motivation to Combine*

Regarding the combination of Beam and Thominet, Petitioner argues that “it would have been obvious to [one] designing an adaptive headlamp to implement Thominet’s multiple directional beam regions with different angles/aimings—through either software or hardware—for different functions in Beam’s system.” Pet. 25–26.

For the “software implementation,” Petitioner asserts that “Beam discloses ‘[t]he angular position’ of each microbeam can be set by controller 108, which commands SLM 203 in illuminator 109, to reduce glare” and that “including an additional control technique,” i.e., “Thominet’s *known technique* of using multiple directional beam regions for different functions” would have “added more control methods for different functions to Beam’s visibility for different driving situations, thereby increasing safety.” Pet. 26 (citing Ex. 1005, 4:26–59, 5:3–21, Figs. 1–2, 5, Abstract, 8:4–17; Ex. 1003, ¶¶ 126, 155, 225).

For the “hardware implementation,” Petitioner asserts that one of skill in art “would have sought to incorporate *known components* . . . of Thominet’s semiconductor light sources 10 on curved surface . . . into Beam’s system (with flat array of light sources 401)” because “this would have, like Thominet, provided different spatial distributions for different driving situations, improving visibility and thereby safety.” Pet. 30 (citing Ex. 1003 ¶¶ 135, 164, 234).

Petitioner makes similar arguments for the combination of Karlsson and Harbers, asserting that “Karlsson discloses ‘directional light sources’ with independently controlled angular positions for reducing glare towards other drivers,” that “Harbers provides further detail on implementing ‘directional light sources’ for different functions, conceptually and physically,” and that “it would have been obvious to [one] designing an adaptive headlamp to implement Harbers’s multiple directional beam segments with different angles/aimings—through either software or hardware—for different functions in Karlsson’s system.” Pet. 80.

Patent Owner argues that the proposed combination of Beam and Thominet would “1) render Beam’s AABH system inoperative or unsatisfactory for its stated purpose of providing ‘high-intensity illumination all the time’ but for selective darkening associated with the location of incoming light, 2) interfere with Thominet’s stated purpose of providing partial predefined regions that are controllable as a unit to deliver multi-functional capability with an LED array and 3) as a result, would not accomplish Petitioner’s proffered purpose of ‘improving driver safety.’” Prelim. Resp. 50. For similar reasons, Patent Owner contends that Beam “teaches away.” *Id.* at 53–54.

We find Patent Owner’s arguments unpersuasive. It is true that Beam describes a system that allows one to maintain maximum intensity at all times except in the direction of oncoming lights, but we do not agree that those teachings would have made it nonobvious to use Beam’s selective darkening technique with Thominet’s different illumination scheme, which provides a different set of benefits. *See Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 795 (Fed. Cir. 2021) (explaining that “simultaneous advantages and

disadvantages . . . do[] not necessarily obviate motivation to combine.”) (quoting *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006)). “It’s not necessary to show that a combination is ‘the best option, only that it be a *suitable* option.’” *Id.* at 800 (quoting *PAR Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1197–98 (Fed. Cir. 2014)).

Patent Owner also argues that Petitioner does not explain how one of ordinary skill in the art would combine the teachings of these references. *See* Prelim. Resp. 55–58. Specifically, Patent Owner argues that the Petition “does not: 1) explain how the combined Beam-Thominet system would determine which LEDs to blank in view of the predefined functionality of the LED regions; 2) how the Beam-Thominet combined hardware or software system would provide spatially differentiated illumination to different subsections based on the detection or identification of a vehicle in a given subsection; or 3) provide Beam’s anti-blinding feature for microbeams that change direction based on Thominet’s curved hardware.” *Id.* at 56. Patent Owner also argues that “Petitioner does not explain how the combined Karlsson/Harbers system . . . controls intensity of the individual spotlight beams of Karlsson in response to light detected by the interspersed light-sensitive sensors of Karlsson, or how parameters such as vehicle velocity, steering wheel position, or weather as disclosed by Harbers are provided by the dipped/main beam groupings of LEDs disclosed by Karlsson.” *Id.* at 57.

We find these arguments also unpersuasive. The proposed combination would employ Thominet’s lighting scheme and Beam’s method of reducing the amount of illumination directed at oncoming traffic. We conclude that it would have been within the level of ordinary skill in the art

(*see* Section II.A) to implement that combination as described in the references and using known light sources, sensors, and control techniques.

Patent Owner additionally argues that Petitioner does not provide a reason to combine, and that the combinations are hindsight reconstructions. *See* Prelim. Resp. 58–63. On the current record, we find Petitioner’s proposed motivations of improving visibility and safety sufficient to justify use of the lighting schemes that the secondary references describe as advantageous for those reasons. That the lighting scheme of the combination would be different from, or even inferior in some respects to, the lighting scheme of the base references would not preclude the combination. *See Intel*, 21 F.4th at 800.

Because we find Patent Owner’s arguments unpersuasive, we conclude that, on the present record, Petitioner’s motivations to combine are sufficient.⁹ However, we note that both secondary references describe use of the curved substrate as optional. *See* Ex. 1006 ¶ 18 (“The semiconductor light sources 10 can be arranged approximately in one plane, or can be distributed over a concavely curved surface or a stepped surface.”); Ex. 1011 7:27–29 (“The array of optoelectronic elements . . . does not have to be provided on a flat substrate, it may alternatively be provided on a curved substrate.”). It thus appears that differently angled light sources may not be necessary to achieve the benefits of the secondary references’ lighting

⁹ We rely on Petitioner’s “hardware implementation” theory because the secondary references disclose differently angled light sources. The “software implementation” arguments are unpersuasive because they rely on the primary references disclosing differently angled light sources, which Petitioner has not shown. The claims require that the light sources be at physically different angles, and incorporation of Thominet’s or Harbers’s “software” into Beam or Karlsson would not result in that physical change.

schemes. The parties are invited to address whether that is correct and, if so, what bearing it might have on the obviousness analysis. For example, the parties may consider whether the benefits cited by Petitioner are sufficient to support modifying the primary references to use the secondary references' lighting schemes *and also* to support modifying the primary references to use the secondary references' curved substrate. The parties may also wish to address whether the law requires a specific or separate motivation to include what may be an optional aspect of the secondary references.

4. *The “Detected Vehicle” and “Output” Limitations*

Patent Owner argues that Beam does not “process the sensor data to determine, within a field-of-view, at least a first subsection including a detected vehicle,” as recited in the claims, because Beam’s “system is agnostic to whether the incoming radiation is from a vehicle, a streetlight or another light source” and “it simply blanks all LEDs correlated with the position of incoming light, regardless of the classification of the light source.” Prelim. Resp. 45. According to Patent Owner, “Beam lacks any specific way to differentiate between different sources of incoming light” and “Beam’s generalized, more simplistic solution is devoid of a machine vision system or pattern recognition system for detecting or identifying a vehicle.” *Id.* Patent Owner similarly argues that “Karlsson, like Beam, lacks the ability to detect or identify a vehicle and then segment the field of view based on the location of the detected vehicle.” Prelim. Resp. 46.

We find these arguments unpersuasive because the claims do not require that the system detect *only* vehicles. We find it sufficient to meet the claim language that Beam and Karlsson would identify oncoming headlights and dim the light being projected in that area, even if they would also reduce light being projected towards other types of light sources. Patent Owner

acknowledges that Beam and Karlsson would be able to reduce the light directed toward headlights. *See, e.g.*, Prelim. Resp. 45 (asserting that Beam “blanks all LEDs correlated with the position of incoming light, regardless of the classification of the light source”). Patent Owner’s arguments about “machine vision” and “pattern recognition” systems are not persuasive because such features are not recited in the claims.

Patent Owner also relatedly argues that because Beam and Karlsson are “incapable of detecting a vehicle,” they are “incapable of differently illuminating at least two distinct subsections to minimize light output at a subsection including the detected vehicle.” Prelim. Resp. 48. We do not agree because, as explained above, the primary references *are* capable of detecting vehicles.

5. *Patentability Conclusion*

Because we find that the Beam/Thominet and Karlsson/Harbers combinations disclose the elements of the independent claims and that Petitioner has shown a sufficient rationale to make each combination, we determine that Petitioner has established a reasonable likelihood of proving that at least one claim is unpatentable over the cited prior art.

D. *Procedural Arguments*

Patent Owner argues that we should exercise our discretion to deny institution because “the Petition lacks particularity.” Prelim. Resp. 64.

Specifically, Patent Owner asserts that the Petition “adopts an extreme word count optimization strategy of hiding the claim limitations in a claim appendix.” *Id.* at 64, 66–67. We agree that Petitioner’s use of claim appendixes is cumbersome, but do not agree that it renders the Petition insufficiently particular.

Patent Owner also argues that, because Petitioner makes alternative arguments, it “does not identify with particularity ‘the *grounds* on which the challenge to each claim is based,’ and therefore should be denied institution under 35 U.S.C. § 312(a)(3).” Prelim. Resp. 68. We do not agree that Petitioner’s challenges lack particularity, because we understand the asserted combinations. Assertions that both references disclose a particular claim element do not undermine or overly cloud Petitioner’s asserted combinations.

Patent Owner also argues that the three parallel petitions filed by Petitioner on the ’503 patent are “redundant,” that they “place a substantial and unnecessary burden on the Board and the patent owner [raising] fairness, timing, and efficiency concerns,” and they “therefore should be denied under 35 U.S.C. §§ 316(b), 314.” Prelim. Resp. 72–73. We do not agree, because we find the filing of three petitions justified in view of the large number of claims and the differences in claim scope.

III. CONCLUSION

We determine that Petitioner has established a reasonable likelihood of proving that at least one claim of the ’503 patent is unpatentable over the cited prior art and that it would not be appropriate to deny institution on procedural grounds. We accordingly institute an *inter partes* review.

IV. ORDER

For the reasons given, it is:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is instituted on all challenged claims with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(a), *inter partes* review of the '503 patent is instituted commencing on the entry date of this Order, and, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is given of the institution of a trial.

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For PETITIONER:

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