

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CAMBRIDGE INDUSTRIES USA, INC., and
ACCELIGHT TECHNOLOGIES, INC.
Petitioners,¹

v.

APPLIED OPTOELECTRONICS, INC.,
Patent Owner.

IPR2025-00437
Patent 10,788,690 B2

Before THU A. DANG, MONICA S. ULLAGADDI, and
IFTIKHAR AHMED, *Administrative Patent Judges*.

Opinion for the Board filed by *Administrative Patent Judge* ULLAGADDI.

Opinion Concurring filed by *Administrative Patent Judge* AHMED.

Opinion Dissenting in part filed by *Administrative Patent Judge* DANG.

ULLAGADDI, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining No Challenged Claims Unpatentable
35 U.S.C. § 318(a)

¹ Accelight Technologies, Inc. was joined as a petitioner in this proceeding based on a petition and motion for joinder filed in IPR2025-01570, which was granted. *See* Paper 27.

I. INTRODUCTION

A. Background and Summary

Cambridge Industries USA Inc. (“Petitioner”) filed a petition (Paper 2, “Pet.”) to institute an *inter partes* review of claims 1–19 (“the challenged claims”) of U.S. Patent No. 10,788,690 B2 (Ex. 1001, “the ’690 patent”). Applied Optoelectronics, Inc. (“Patent Owner”) did not file a Preliminary Response on the merits of patentability.

Upon review of the preliminary record, we instituted *inter partes* review, pursuant to 35 U.S.C. § 314, as to the challenged claims based on the challenges set forth in the Petition. Paper 11 (“Institution Decision” or “Inst. Dec.”). Patent Owner thereafter filed a Response (Paper 14, “Patent Owner’s Response” or “PO Resp.”), Petitioner filed a Reply to Patent Owner’s Response (Paper 21 “Petitioner’s Reply” or “Pet. Reply”), and Patent Owner filed a Sur-Reply (Paper 24, “Patent Owner’s Sur-Reply” or “PO Sur-Reply”). On June 4, 2026, we held an oral hearing. A transcript of the hearing is of record. Paper 29 (“Tr.”).

For the reasons that follow, we conclude Petitioner has not established that any of the challenged claims of the ’690 patent is unpatentable by a preponderance of the evidence.

B. Real Parties in Interest

Petitioner Cambridge Industries USA Inc. identifies itself and its parent corporation, CIG Shanghai, Co. Ltd., as real parties-in-interest. Pet. 39. Petitioner Accelight Technologies, Inc. identifies itself and Accelight Technologies (Wuhan) Inc. as real parties-in-interest. IPR2025-01570, Paper 1, 31. Patent Owner identifies itself as a real party-in-interest. Paper 6, 2.

C. Related Matters

The parties identified as related proceedings the co-pending district court proceedings of *Applied Optoelectronics, Inc. v. Cambridge Industries USA, Inc.*, No. 3:24-cv-01010-JD (N.D. Cal.) (filed Feb. 20, 2024) and *Applied Optoelectronics, Inc. v. Accelight Technologies, Inc.*, 4:24-cv-09041 (N.D. Cal. filed Dec. 13, 2024). Pet. 39; Paper 6, 2.

D. The '690 Patent

The '690 patent describes “an optical isolator array with a magnetic base that allows for mounting and alignment of N number of optical isolator[] modules within an optical subassembly module.” Ex. 1001, code (57). “[T]he magnetic base provides at least one mounting surface for coupling to N number of optical isolators, with N being equal to an optical channel count for the optical subassembly (e.g., 4-channels, 8-channels, and so on).” *Id.* The optical isolators are secured to the magnetic base in a predefined arrangement by an “adhesive such as ultraviolet-curing (UV-curing) optical adhesives.” *Id.* Arranging the optical isolators on the magnetic base in this manner provides for “a relatively compact and modular profile that supports N number of optical isolators for use in an optical subassembly module.” *Id.* at 1:9–11.

E. Illustrative Claims

Claims 1 and 11 are the independent claims among the challenged claims. Claim 1 recites:

- 1[a]. An optical isolator array for use in an optical subassembly module, the optical isolator array comprising:
- 1[b] a first magnetic base defining at least one mounting surface;
- 1[c] a plurality of optical isolators mounted to the at least one mounting surface, each of the plurality of optical isolators disposed substantially in parallel relative to each other; and

- 11[d] at least one layer of adhesive disposed on the at least one mounting surface to couple the plurality of optical isolators to the first magnetic base and to hold each optical isolator of the plurality of optical isolators at a predefined position relative to each other.

Ex. 1001, 9:21–33 (with bracketed labels for reference purposes). Claim 11 recites:

- 11[a]. An optical transceiver, the optical transceiver comprising:
- 11[b] a transceiver housing;
- 11[c] at least one optical transmitter subassembly (TOSA) arrangement disposed in the transceiver housing, the at least one TOSA arrangement comprising:
- 11[d] a substrate defined by at least one mounting surface;
- 11[e] a plurality of laser diodes mounted to the at least one mounting surface of the substrate, each laser diode of the plurality of laser diodes to emit a different associated channel wavelength along a corresponding light path of a plurality of light paths; and
- 11[f] an optical isolator array mounted to the at least one mounting surface adjacent the plurality of laser diodes such that the plurality of light paths intersect with the optical isolator array, the optical isolator array comprising a at least a first magnetic base and a plurality of optical isolators coupled thereto, and wherein each optical isolator is optically aligned with a corresponding laser diode of the plurality of laser diodes via a corresponding light path;
- 11[g] an optical receiver subassembly (ROSA) disposed in the transceiver housing.

Id. at 10:5–28 (with bracketed labels for reference purposes).

F. Prior Art and Asserted Grounds

Petitioner asserts that claims 1–19 are unpatentable in view of the following challenges. Pet. 2. Petitioner supports its challenges with the

Declaration of Dr. Andrew G. Kirk. Ex. 1003. Patent Owner supports its arguments with the Declaration of Dr. Alan E. Willner. Ex. 2004.

Claim(s) Challenged	35 U.S.C. § ²	Reference(s)/Basis
1–10	102	Wang ³
11–19	103	Wang, Xiong ⁴

II. ANALYSIS

A. Legal Standards

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros., Inc. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987).

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

² The Leahy-Smith America Invents Act, Pub. L. No. 112–29, 125 Stat. 284 (2011) (“AIA”), included revisions to 35 U.S.C. §§ 102 and 103 that became effective before the effective filing date of the challenged claims. Therefore, we apply the AIA versions of 35 U.S.C. §§ 102 and 103.

³ Chinese Patent No. 208421455 U (Ex. 1005), issued Jan. 22, 2019. We cite to an English language translation (Ex. 1006, “Wang”) of the Chinese patent.

⁴ U.S. Patent No. 9,563,073 B2, issued Feb. 7, 2017 (Ex. 1008, “Xiong”).

evidence of nonobviousness.⁵ *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”)). The 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) (citing *Tech. Licensing Corp. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in an *inter partes* review). Furthermore, Petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

Thus, to prevail in an *inter partes* review, Petitioner must explain how the prior art discloses the challenged claims or how the proposed combinations of prior art would have rendered the challenged claims unpatentable. We analyze the challenges presented in the Petition in accordance with the above-stated principles.

B. Level of Ordinary Skill in the Art

In determining 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

⁵ Neither party has presented evidence concerning objective indicia of nonobviousness.

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).

According to Petitioner, a person of ordinary skill “relevant to the field of the ’690 Patent would have had at least (1) an undergraduate degree in electrical engineering, computer engineering, computer science, or a comparable field of study and (2) at least two years of experience with optical data communications or a comparable field of work.” Pet. 14 (citing Ex. 1003 ¶ 22). Petitioner also states that “[i]ndividuals having different educational backgrounds and supplemental experience might still be of ordinary skill in the art if such experience compensates for any deficiencies in education relative to the criteria stated above” and “[i]n some cases, additional education might be an acceptable substitute for some experience, or vice versa.” *Id.* Patent Owner does not dispute Petitioner’s characterization of the level of skill in the art. *See e.g.*, PO Resp. 9.

We adopt Petitioner’s unopposed definition of the level of ordinary skill in the art as it appears consistent with the disclosures of the ’690 patent and the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

C. Claim Construction

In an *inter partes* review, we construe claim terms according to the standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b) (2023). Under *Phillips*, claim terms are afforded “their ordinary and customary meaning.” *Phillips*, 415 F.3d at 1312. “[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Id.* at 1313. “Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the

context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.*

According to Petitioner, “[t]he language used in the claims of the ’690 Patent is self-explanatory and would have been recognized by a [person of ordinary skill in the art] as having plain and ordinary meanings.” Pet. 10. “Petitioner submits that no special constructions are required” because “the claim terms appear understandable in the context of the disclosure provided by the specification of the ’690 Patent.” *Id.* (citing Ex. 1003 ¶ 58). Patent Owner “agrees that the claim terms should be given their plain and ordinary meaning as understood by a [person of ordinary skill in the art].” PO Resp. 10.

After reviewing the arguments and evidence before us, we determine that we do not need to expressly construe any claim term to resolve any controversy in the proceeding. *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. Ground 1: Anticipation of Claims 1–10 by Wang

Petitioner contends that Wang anticipates claims 1–10. Pet. 15–24.

1. Wang

Wang discloses a multi-channel isolator device. Ex. 1006 ¶ 1. By way of background, Wang explains that “[a]n optical isolator is a passive optical component that only allows one-way light to pass through.” *Id.* ¶ 2. “In particular, a free space isolator has the main function of achieving low-loss forward transmission and high-loss reverse isolation for polarized light.” *Id.* Wang explains that the free space isolator has several disadvantages,

including “the overall required space is large” (*id.* ¶ 8) and “difficulty of assembly” (*id.* ¶¶ 9, 10).

To solve these problems, Wang discloses a multi-channel isolator device that “comprises a substrate with multiple channels and a plurality of isolators disposed in the respective channels on the substrate.” *Id.* ¶ 12. Wang’s “isolator comprises a polarizing polarizer, a Faraday plate, and an analyzer disposed in sequence,” and “all or a part of the substrate is made of a magnetic material that can generate a magnetic field.” *Id.* ¶ 12. Wang further describes that, in a preferred embodiment, “the substrate comprises a base,” and that “baffles and isolators [] are disposed on the base in sequence,” such that “any adjacent ones of the baffles and the base form a channel for accommodating an isolator, and the isolator is separately bonded to the baffles and the base by means of an adhesive.” *Id.* ¶ 14.

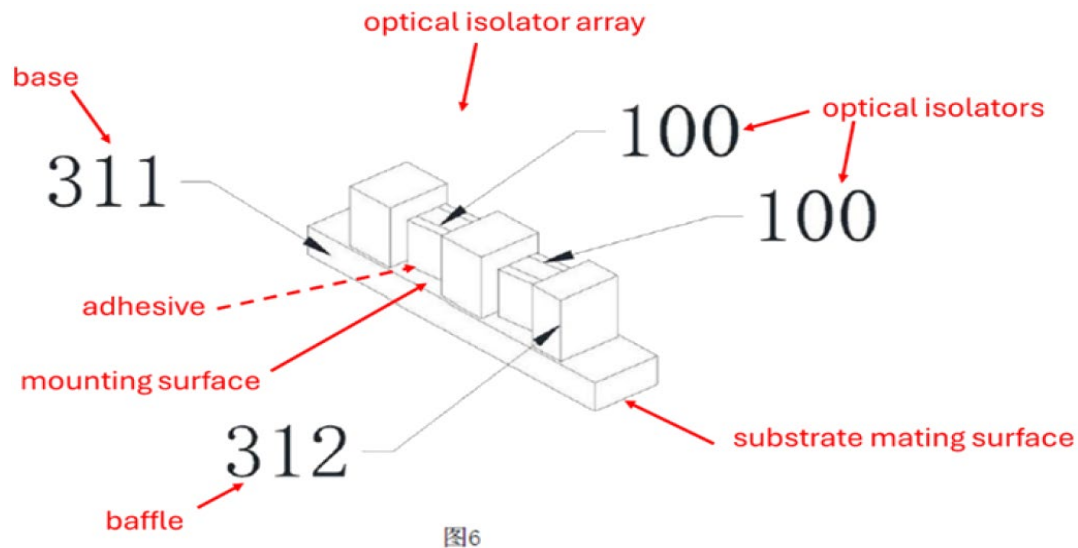
2. Analysis of Claim 1

Petitioner contends independent claim 1 is unpatentable under 35 U.S.C. § 102 as anticipated by Wang. Pet. 15–16. Patent Owner does not dispute Petitioner’s showing that claim 1 is anticipated by Wang. *See generally* PO Resp. Instead, Patent Owner points out that Petitioner bears the burden of proving unpatentability by a preponderance of the evidence. PO Sur-reply 2 (citing 35 U.S.C. § 316(e)). For the reasons below, we determine that Petitioner does not establish that claim 1 is unpatentable under 35 U.S.C. § 102 as anticipated by Wang by a preponderance of the evidence.

a) Petitioner's Arguments

- (1) *Limitation 1[a]: “An optical isolator array for use in an optical subassembly module, the optical isolator array comprising:”*

Petitioner argues that “Wang discloses a multichannel optical isolator array that solves space limitation and assembly difficulty problems when free space isolators need to be used for multi-channel optical components.” Pet. 15 (citing Ex. 1005; Ex. 1006 ¶¶ 8–11; Ex. 1003 ¶ 71). Petitioner’s annotated version of Wang’s Figure 6 is reproduced below.



Ex. 1005, FIG. 6 (annotated)

Petitioner’s annotated version of Wang’s Figure 6 is a perspective schematic view of a first embodiment disclosed in Wang and depicts optical isolators 100 on base 311 and separated by baffles 312. Ex. 1006 ¶ 45.

- (2) *Limitation 1[b]: “a first magnetic base defining at least one mounting surface;”*

Petitioner asserts that “Wang discloses the optical isolator array includes a base (base 311, substrate 320) that defines at least one mounting surface for the optical isolator array.” Pet. 15 (citing Ex. 1005, Fig. 6; Ex. 1006 ¶¶ 37–39). According to Petitioner, “Wang further discloses that all or

part of the base is made of a magnetic material that can generate a magnetic field.” *Id.* at 16 (citing Ex. 1005; Ex. 1006 ¶¶ 12, 40; Ex. 1003 ¶ 72).

- (3) *Limitation 1[c]: “a plurality of optical isolators mounted to the at least one mounting surface, each of the plurality of optical isolators disposed substantially in parallel relative to each other; and”*

Petitioner asserts that “Wang discloses multiple optical isolators are mounted on the base in a substantially parallel arrangement relative to each other with an adhesive, such that the adhesive fills any gaps between the optical components and the base to control accuracy of the positioning of the isolators.” Pet. 16 (citing Ex. 1005; Ex. 1006 ¶¶ 41, 43; Ex. 1003 ¶ 75). According to Petitioner, “Wang further teaches that its opto-isolator array achieves a compact product with improved accuracy of spacing between the isolators for multi-channel applications.” *Id.* (citing Ex. 1005; Ex. 1006 ¶¶ 8–11, 41, 43; Ex. 1003 ¶ 73).

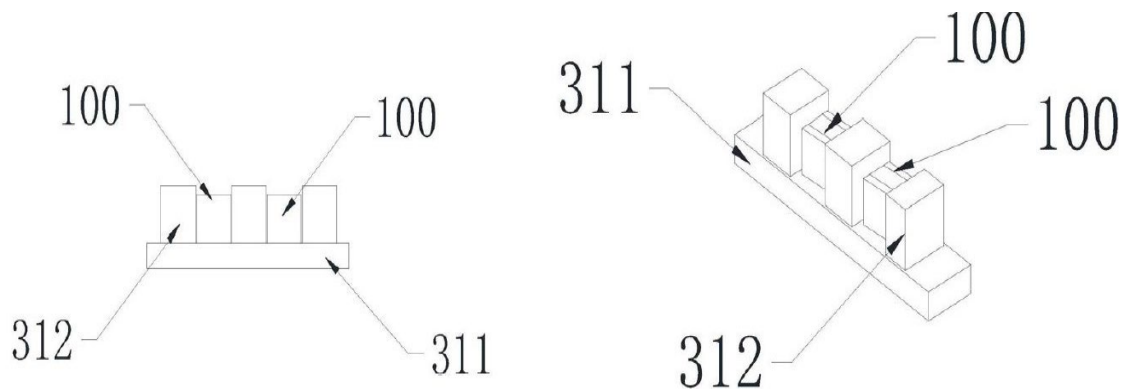
- (4) *Limitation 1[d]: “at least one layer of adhesive disposed on the at least one mounting surface to couple the plurality of optical isolators to the first magnetic base and to hold each optical isolator of the plurality of optical isolators at a predefined position relative to each other.*

Petitioner asserts that “Wang teaches that the optical isolators are mounted to the substrate, in predefined positions relative to one another, by adhesive that holds the isolators in position.” Pet. 16 (citing Ex. 1005, Figs. 6, 8, 10; Ex. 1006 ¶¶ 13, 14). Petitioner further asserts that “Wang describes that the multiple optical isolators are bonded to the base, in between baffles, by adhesive in a substantially parallel arrangement relative to each other, such that the adhesive fills any gaps between the optical components and the substrate to thereby control accuracy of the positioning of the isolators.” *Id.* (citing Ex. 1005; Ex. 1006 ¶¶ 41, 43; Ex. 1003 ¶ 74).

b) Our Analysis of Petitioner's Arguments

With respect to limitation 1[c], the cited portion in paragraph 41 of Wang discloses that “the isolator 100 is bonded to the substrate by means of an adhesive” in which “[t]he adhesive is not only used to fix the isolator 100 to the substrate, *but also fills a gap between the isolator 100 and the substrate* to improve the installation accuracy of the isolator 100.” Ex. 1006 ¶ 41 (emphasis added). Petitioner does not explain how filling in a gap between the isolator 100 and a substrate necessarily results in “each of the plurality of optical isolators [being] disposed substantially in parallel relative to each other,” as recited in claim 1.

The cited portion in paragraph 43 references Figures 5 and 6, which depict Embodiment 1 of Wang and are reproduced below.



Figures 5 and 6 of Wang depict isolators 100, base 311, and baffles 312. Although paragraph 44 of Wang states that “[t]he substrate includes a base 311, and baffles 312 and isolators 100 sequentially disposed on the base 311,” Petitioner does not sufficiently persuade us how Wang’s disclosure “sequentially disposed” isolators *necessarily* discloses that the isolators are “disposed substantially in parallel relative to each other” as recited in independent claim 1. Ex. 1006 ¶ 44. Although the cited portion in Figure 6 of Wang apparently *shows* a *possibly* parallel arrangement of

isolators, Petitioner does not *argue* the same with respect Wang's figures. Petitioner cites to Dr. Kirk's Declaration, but Dr. Kirk does not opine on why cited portions of Wang *necessarily* disclose or depict the claimed "disposed substantially in parallel relative to each other" requirement. Ex. 1003 ¶¶ 73, 74; Ex. 1006 ¶¶ 41, 43, Figs. 6, 8, 10. At best, Dr. Kirk testifies that "a POSITA would have understood that Wang anticipates Claim 1." Ex. 1003 ¶ 75.

Also relevant to our analysis is that this is an anticipation ground and Petitioner is required to show that the reference discloses not only the elements of the claimed invention, but also discloses those elements as arranged in the claim. *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008). Although our Institution Decision concluded that Petitioner had demonstrated a reasonable likelihood of prevailing with respect to its anticipation challenge to independent claim 1 applying Wang (Inst. Dec. 6), at this stage of the proceeding we are required to evaluate Petitioner's challenges under a higher standard, the preponderance of evidence standard.

For the foregoing reasons, we are not persuaded that Petitioner sufficiently establishes that claim 1 is unpatentable under 35 U.S.C. § 102 as anticipated by Wang by a preponderance of the evidence.

3. *Analysis of Claims 2–10*

Claims 2–10 depend, directly or indirectly, from independent claim 1. We do not discern that Petitioner's showings for any of dependent claims 2–10 cure the deficiencies set forth above in Section II.D.2 with respect to independent claim 1. Pet. 17–24. Accordingly, we reach the same conclusion with respect to these claims as we reach with respect to independent claim 1. We are not persuaded that Petitioner sufficiently establishes that dependent

claims 2–10 are unpatentable 35 U.S.C. § 102 as anticipated by Wang by a preponderance of the evidence.

E. Ground 2: Obviousness of Claims 11–19 Over Wang and Xiong

Petitioner contends that claims 11–19 would have been obvious over Wang in view of Xiong. Pet. 24–32.

1. Xiong

Xiong “relates generally to optical isolators, and in particular to multifunctional optical isolators suitable for use in a [Transmit Optical Subassembly (TOSA)].” Ex. 1008, 1:11–13. By way of background, and referring to Figure 1, Xiong explains that “a typical TOSA includes a spot size converter 120, an isolator 140, and a beam splitter 160.” *Id.* at 1:24–25. Figure 1 of Xiong is reproduced below.

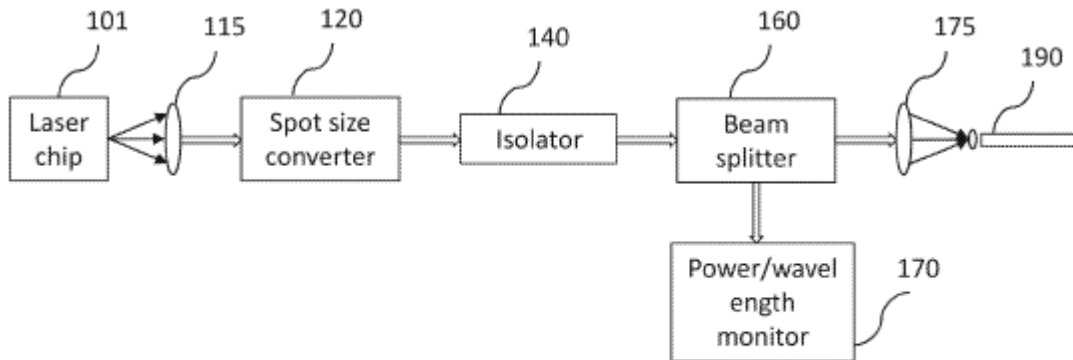


FIG. 1
(Prior Art)

Xiong describes that “[t]he spot size converter 120 shapes and/or sizes the beam of light emitted from the laser chip 101 and collimated by the collimating lens 115 to improve coupling efficiency into an optical fiber, and thus provide higher power” and “[t]he isolator 140 prevents back-reflection light from reaching the laser chip 101, while allowing the light to pass to the beam splitter 160.” *Id.* at 1:25–32. Xiong explains that “[t]he beam splitter

160 allows a portion of the light to be tapped and diverted to a power/wavelength monitor 170, while allowing the remaining light to be transmitted to the optical fiber coupled to the fiber pigtail 190 via the focusing lens 175.” *Id.* at 1:32–36. Xiong further describes that “[t]he spot size converter 120 shapes and/or sizes the beam of light emitted from the laser chip (e.g., a laser diode)” and,

[i]n particular, since the output beam of light of most laser diodes has an elliptical cross-section (e.g., elongated in the vertical direction), the spot size converter will often reduce the beam aspect ratio (e.g. beam waist ratio along horizontal and vertical axes) such that the cross-section of the beam of light is closer to circular.

Id. at 1:41–47. Xiong further explains that “[t]he isolator 140 is an optical isolator, which passes the forward propagating light advancing from the laser chip 101 and prevents the backward propagating light from propagating to the laser chip 101 (e.g., back reflected light)” and “[i]n general, the optical isolator 140 may be a polarization dependent isolator or a polarization independent isolator.” *Id.* at 1:66–2:4.

2. *Analysis of Claim 11*

Petitioner argues that the combination of Xiong and Wang teaches or suggests the limitations recited in challenged independent claim 11. Pet. 27–30. Patent Owner disputes Petitioner’s arguments. PO Resp. 10–18. For the reasons below, we determine that Petitioner does not establish that claim 11 is unpatentable under 35 U.S.C. § 103 as obvious in view of Wang and Xiong by a preponderance of the evidence.

a) Petitioner's Arguments

(1) Motivation to Combine

Petitioner contends that “a [person of ordinary skill in the art] would have been motivated to combine the optical isolator array of Wang into an optical subassembly module, as taught by Xiong, to create an optical transceiver that addresses the space, complexity and assembly problems known to exist with multi-channel optical components.” Pet. 24–25 (citing Ex. 1003 ¶ 96). First, Petitioner contends that “a [person of ordinary skill in the art] would have understood the need to optimize available space within an optical module and also simplify the assembly and adjustment process prior to January 2019.” *Id.* at 25 (citing Ex. 1003 ¶ 97). Second, Petitioner contends that “a [person of ordinary skill in the art] would have been motivated to combine Wang into an optical transceiver having a TOSA, such as Xiong, because both references employ optical isolators to facilitate propagation of light incident to an optical isolator in preferred directions.” *Id.* at 25–26 (Ex. 1003 ¶ 98). And, according to Petitioner “a [person of ordinary skill in the art] would have understood that the optical isolator array of Wang could successfully be employed in a TOSA and optical transceiver, as exemplified by Xiong, because a [person of ordinary skill in the art] would have understood that achieving the stated goals and benefits described in Wang, in TOSAs and optical transceivers, was the intended use of the device disclosed in Wang.” *Id.* at 26 (citing Ex. 1003 ¶ 99).

(2) Limitation 11[a]: “An optical transceiver, the optical transceiver comprising:”

Petitioner contends that “Xiong discloses an optical transceiver having a TOSA.” Pet. 27 (citing Ex. 1008, 1:17-19; see also Ex. 1003 ¶ 100). Patent Owner does not dispute Petitioner’s position for this limitation.

(3) Limitation 11[b]: “a transceiver housing;”

Petitioner contends that “[a person of ordinary skill in the art] would have understood, and it was well-known in January 2019, that the optical transceiver would include a transceiver housing to house various subassemblies and components of the optical transceiver.” Pet. 27 (citing Ex. 1003 ¶ 101). Patent Owner does not dispute Petitioner’s position for this limitation.

(4) Limitation 11[c]: “at least one optical transmitter subassembly (TOSA) arrangement disposed in the transceiver housing, the at least one TOSA arrangement comprising:”

Petitioner contends that “Xiong discloses the optical transceiver includes at least one TOSA arrangement.” Pet. 27 (citing Ex. 1008, FIG. 1, 1:19-21; Ex. 1003 ¶ 102). According to Petitioner, “[a person of ordinary skill in the art] would have understood, and it was well-known in January 2019, that the TOSA arrangement would be located in the transceiver housing of the optical transceiver.” *Id.* (citing Ex. 1003 ¶ 102).

Patent Owner disputes Petitioner’s arguments with respect to this limitation. PO Resp. 10 (citing Ex. 2004 ¶ 69). We address Patent Owner’s arguments with respect to limitation 11[c] below.

(5) Limitation 11[d]: “a substrate defined by at least one mounting surface;”

Petitioner contends that “Wang discloses a substrate of an optical isolator array that is defined by at least one mounting surface.” Pet. 28 (citing Ex. 1005 Figs. 5–10; Ex. 1006 ¶¶ 37–39; Ex. 1003 ¶ 103). According to Petitioner, “[a person of ordinary skill in the art] would have understood, further in view of Xiong, that the optical isolator array and associated

components are included in the TOSA arrangement.” *Id.* (citing Ex. 1003, ¶ 103).

Patent Owner does not dispute Petitioner’s position for this limitation.

(6) *Limitation 11[e] a plurality of laser diodes mounted to the at least one mounting surface of the substrate, each laser diode of the plurality of laser diodes to emit a different associated channel wavelength along a corresponding light path of a plurality of light paths; and*

Petitioner contends that “Xiong discloses the TOSA includes a number of laser diodes each designed to emit a different associated channel wavelength along a corresponding light path of a number of light paths.” Pet. 28 (citing Ex. 1008, Fig. 1, 1:24–65, 6:66–7:3; Ex. 1003 ¶ 104).

According to Petitioner, “[a person of ordinary skill in the art] would have understood, further in view of Wang, that the laser diodes would be mounted to the mounting surface(s) of the substrate in alignment with respective optical isolators of the optical isolator array.” *Id.* (citing Ex. 1003 ¶ 104).

Patent Owner disputes Petitioner’s arguments with respect to this limitation. We address Patent Owner’s arguments with respect to limitation 11[e] below.

(7) *Limitation 11[f] an optical isolator array mounted to the at least one mounting surface adjacent the plurality of laser diodes such that the plurality of light paths intersect with the optical isolator array, the optical isolator array comprising a at least a first magnetic base and a plurality of optical isolators coupled thereto, and wherein each optical isolator is optically aligned with a corresponding laser diode of the plurality of laser diodes via a corresponding light path;*

Petitioner contends that “Wang discloses an optical isolator array for use in an optical subassembly module comprising a substrate with multiple channels and a plurality of isolators disposed in the respective channels,

wherein each opto-isolator includes a polarizer, a Faraday plate, and an analyzer disposed in sequence.” Pet. 29 (citing Ex. 1005, Fig. 1; Ex. 1006 ¶¶ 37–39; Ex. 1003 ¶ 105).

Patent Owner disputes Petitioner’s arguments with respect to this limitation. We address Patent Owner’s arguments with respect to limitation 11[f] below.

(8) Limitation 11[g] an optical receiver subassembly (ROSA) disposed in the transceiver housing.

Petitioner contends that “Xiong discloses the optical transceiver includes a ROSA.” Pet. 30 (citing Ex. 1008, 1:19–23; Ex. 1003 ¶ 107). Patent Owner does not dispute Petitioner’s position for this limitation.

b) Patent Owner’s Arguments

With regard to limitation 11[c], Patent Owner argues that “Petitioner argues only that Xiong discloses at least one TOSA arrangement, and does not argue that Wang discloses the at least one TOSA arrangement.” PO Resp. 11 (citing Pet. 27; Ex. 1003 ¶ 102); *see id.* at 10 (citing Ex. 2004 ¶ 69). “However,” according to Patent Owner, “Xiong does not disclose a TOSA arrangement *that is multi-channel* as required by the ’690 Patent.” *Id.* (citing-in-part Ex. 2004 ¶ 70) (emphasis added). Patent Owner argues that “[a]t most, Xiong mentions using the single combined splitter, isolator, and spot-size converter in a *single-channel* TOSA.” *Id.* at 12 (citing-in-part Ex. 1008, 14:61–63) (emphasis added).

With regard to limitation 11[e], Patent Owner argues that “Petitioner argues only that Xiong discloses this limitation, and does not argue that Wang discloses the TOSA including a number of laser diodes each designed to emit a different associated channel wavelength along a corresponding light path of a number of light paths.” PO Resp. 13 (citing Pet. 28; Ex. 1003

¶ 104). According to Patent Owner, “a [person of ordinary skill in the art] would not understand Xiong to disclose *a plurality of laser diodes*, each *emitting different wavelengths* for a multi-channel TOSA arrangement.” *Id.* (citing Ex. 2004 ¶ 74) (emphasis added). Patent Owner reiterates that “Xiong relates to a single combined splitter, isolator and spot-size converter for potential use in a single-channel TOSA.” *Id.* at 13–14 (citing Ex. 2004 ¶ 74; Ex. 1008, Abstract).

With regard to limitation 11[f], Patent Owner argues that “Xiong does not disclose an isolator array” because “Xiong discloses *a single isolator*.” PO Resp. 15–16 (citing Ex. 2004 ¶ 77; Ex. 1008, Abstract) (emphasis added). Patent Owner again argues that “Xiong does not disclose *a plurality of laser diodes*.” *Id.* at 16 (emphasis added). Patent Owner concludes that “Xiong does not disclose an optical isolator *array* mounted adjacent to laser diodes such that the light paths intersect with the optical isolator array as [Petitioner] contends.” *Id.* (emphasis added).

With regard to Petitioner’s rationale for combining, Patent Owner argues that “a [person of ordinary skill in the art] would not have been motivated to combine the two references to achieve the claimed invention.” PO Resp. 16 (citing Ex. 2004 ¶ 79). According to Patent Owner, the proposed combination (1) “would render Xiong unsatisfactory for its intended” (*id.*) (2) “would require significant redesigns” (*id.* at 17) and (3) “would change the principle of operation of the reference” (*id.* at 18).

c) Petitioner’s Reply Arguments

First, Petitioner argues that it “relied on and cited to ***the admitted prior art disclosed in FIG. 1. of Xiong***, which is discussed in the ‘Background’ portion of Xiong (and depicted in FIG. 1) as invalidating

claims 11-19 when combined with Wang.” Pet. Reply 4. According to Petitioner,

Patent Owner argues with respect to claims 11-19 that a POSITA would not have understood how to use the opto-isolator of Wang for its intended purpose. But the ’690 patent explains that this exact use was well-known in the art at the time the ’690 patent was filed. Rather than address this admission, Patent Owner instead focuses on whether Wang could not be used with the specific spot size converter disclosed in Xiong.

Id. at 4–5; *see id.* at 6–7. After summarizing portions of the ’690 patent and Dr. Willner’s deposition testimony, Petitioner contends that “[t]he foregoing admissions demonstrate that a POSITA, given the opto-isolator array of Wang, would have found the recitations of claim 11 entirely obvious in view of the teaching of Xiong (and the admissions regarding prior art in the ’690 patent).” *Id.* at 9.

Second, Petitioner argues that “[a]t no point in the Response does Patent Owner acknowledge that the prior art systems of FIG. 1 of Xiong teaches [sic] all of the elements recited in claim 11, *which plainly must be replicated for multiple channels* to employ the **array** of opto-isolators disclosed in Wang’s multichannel opto-isolator array.” Pet. Reply 7 (first emphasis added); *id.* at 10 (“A POSITA further would have understood that for a multichannel device as described in Wang, *the arrangement of the prior art FIG. 1 of Xiong would be replicated* for each opto-isolator in the array.” (citing Ex. 1014, 28:7–29:16) (emphasis added)).

Petitioner also argues that “[w]hen the correct combination is considered for invalidity purposes (i.e., Xiong’s prior art of FIG. 1), it is plain that a [person of ordinary skill in the art] would [have] readily been motivated to incorporate that structure to utilize the multichannel opto-

isolator disclosed in Wang.” Pet. Reply 11 (citing Pet. 28; Ex. 1003 ¶¶ 99, 104; Ex. 1001, 1:35–37).

Third, Petitioner argues that Dr. Willner’s Declaration is unreliable because he “could not articulate the basis for his written opinions, as opposed to the admissions made during his deposition.” Pet. Reply 12. Petitioner notes that in his Declaration, Dr. Willner opined that he considered the limitations of claim 11 and what a POSITA would have understood the terms of that claim to mean. *Id.* (citing Ex. 1014, 37:16–20). Petitioner argues, however, that “during his deposition, he was repeatedly unable to explain what the terms of claim 11 would have meant to a POSITA.” *Id.* at 12–13 (citing Ex. 1014, 36:15–41:13); *see id.* at 13–14.

d) Our Analysis of Petitioner’s and Patent Owner’s Arguments for Independent Claim 11

The dispute between the parties centers on what constitutes Petitioner’s position as to the combination of Wang and Xiong and whether it was first presented in the Petition. As set forth above, the Petition cites Xiong as “disclos[ing] the optical transceiver includes at least one TOSA arrangement.” Pet. 27 (citing Ex. 1008, Fig. 1, 1:19–21; Ex. 1003, ¶ 102). The Petition states that “[a] POSITA would have understood, and it was well-known in January 2019, that the TOSA arrangement would be located in the transceiver housing of the optical transceiver.” *Id.* (citing Ex. 1003 ¶ 102). Continuing on to limitation 11[e], the Petition states that “Xiong discloses *the TOSA includes a number of laser diodes* each designed to emit a different associated channel wavelength along a corresponding light path of a number of light paths,” notwithstanding the fact that Figure 1 of Xiong cited and annotated with respect to limitation 11[c] depicts a single laser chip 101 and not a plurality of laser diodes. *Id.* at 28 (citing Ex. 1008, Fig. 1,

1:24–65, 6:66–7:3; Ex. 1003 ¶ 104) (emphasis added). The Petition muddies the waters further with its showing for limitation 11[f] by stating that “Wang discloses an optical isolator array” *and* “Xiong discloses an optical isolator array,” which is “mounted adjacent to *laser diodes such that the light paths intersect* with the optical isolator array and, moreover, such that each optical isolator is optically aligned with a corresponding laser diode via a corresponding light path.” *Id.* at 29 (citing Ex. 1008, 1:24–65, 6:66–7:3; Ex. 1003 ¶ 106) (emphasis added).

To the extent that Petitioner attempts to rehabilitate the obviousness challenge set forth in the Petition by citing the background of the ’690 patent and Dr. Willner’s deposition testimony and characterizing the same as “admissions” of Patent Owner in Petitioner’s Reply, such “evidence” did not form the basis of Appellant’s original position set forth in the Petition.⁶ Petitioner’s arguments that all of the components recited in claim 11 “were known in the prior art” or that Dr. Willner admitted the same are unpersuasive at least because the Petition did not set forth this position. Contrary to Petitioner’s arguments during the oral hearing, the Petition does not present challenges based on “Applicant Admitted Prior Art.” *See generally* Pet.

We attempted to clarify Petitioner’s challenge to independent claim 11 during the oral hearing.

JUDGE ULLAGADDI: . . . Claim 11 recites a plurality of laser diodes mounting to at least one mounting surface, each laser diode of the plurality to admit a different associated channel

⁶ Even if it were somehow possible to cite Dr. Willner’s later-arising deposition testimony in the Petition, we note that his testimony is not a patent or printed publication as required by 37 C.F.R. § 42.104(b)(4).

wavelength. Which reference teaches those plurality of laser diodes?

MR. PISANO: Well, I would say at least the '690 [patent] does in the background of the invention.

JUDGE ULLAGADDI: But is that part of the challenge that's in the petition?

MR. PISANO: I believe it is, Your Honor. Because I think what we specifically cite to this portion of the '690 patent, and I can look it up and tell you where. But in paragraph 29 to 35, say, and if you look at -- and this is what I have on the screen right now . . .

JUDGE ULLAGADDI: The question I'm asking there is not what the '690 patent background says, but do the challenges rely on applicant-admitted prior art?

MR. PISANO: We believe it does, Your Honor. Because if you look at the petition at page -- *we are at page 3 of the petition*. We specifically cite, optical transceivers generally include optical subassembly modules such as the TOSA and ROSA. See Exhibit 1 at 29 to 35. . . . So, respectfully, I do think that that prior art is how -- or that admitted prior is part of what is cited in the Petition.

Tr. 12:6–13:12 (emphasis added). The portion of the Petition on page 3 cited by Petitioner's counsel during the oral hearing is Section IV.A of the Petition entitled "Technical Background." Merely describing the background of the technology disclosed in the challenged patent does not sufficiently persuade us that Petitioner's second challenge, "Claims 11–19 are unpatentable under 35 U.S.C. § 103 as obvious over Wang in view of knowledge of skill in the art, as exemplified by Xiong" (Pet. 2) is *also* based on AAPA. It is further unclear from page 3 of the Petition what specific portions of the alleged AAPA Petitioner apparently intended to rely on. *See* 37 C.F.R. § 42.104(b)(5) ("The Board may exclude or give no weight

the evidence where a party has failed to state its relevance or to identify specific portions of the evidence that support the challenge.”).

During the oral hearing, we also pointed out the specific portions of Xiong cited in the Petition for limitation 11[e]:

JUDGE ULLAGADDI: [I]n the petition, on page 28, for an element 11E, it says, Xiong discloses the TOSA includes a number of laser diodes, each designed to emit to a different associated channel wavelength along a light path -- of a number of light paths.

MR. PISANO: Yes, Your Honor.

JUDGE ULLAGADDI: So is it the ‘690 patent background . . . Petitioner is relying on, or is it Xiong, or is it I think in the reply --

MR. PISANO: It’s also Wang.

JUDGE ULLAGADDI: Wang also, in the reply it says that Wang -- Xiong teaches all the elements recited in Claim 11, which plainly must be replicated for multiple channels to employ the array of opto-isolators. That's on Petitioner's reply 7.

MR. PISANO: Right.

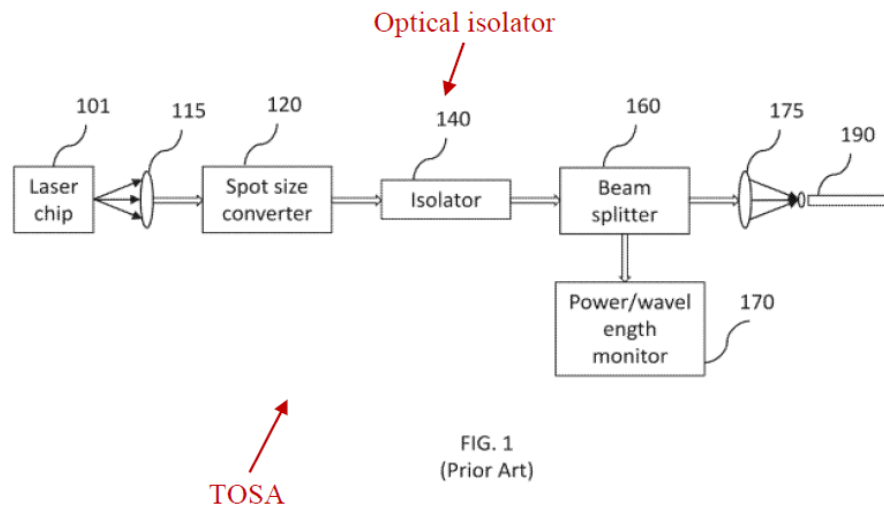
JUDGE ULLAGADDI: So I’m hearing three different positions. I'm not clear on [which] specifically of the three that Petitioner’s challenge relies on.

MR. PISANO: Okay. So I believe, Your Honor, we rely upon the background, the admitted prior art, which we cite in the Petition of the ‘690 patent, which talks about multichannel TOSAs and ROSAs, talks about having a plurality of laser diodes mounted on something and pointing at the opto-isolators.

Tr. 13:13–14:9. Based on the complete record developed during trial, we determine that there is insufficient support for Petitioner’s *first* set of arguments that it relies on AAPA for its challenge to independent claim 11.

With regard to Petitioner’s *second* set of arguments, we agree with Patent Owner that what Xiong shows is a “a single combined splitter,

isolator and spot-size converter” and that “a [person of ordinary skill in the art] would not understand Xiong to disclose a plurality of laser diodes, each emitting different wavelengths for a multi-channel TOSA arrangement.” PO Resp. 13–14 (citing Ex. 2004 ¶ 74; Ex. 1008, Abstract). The Petition *does not* indicate that any portion of Xiong, let alone each of the elements shown in cited Figure 1 which Petitioner labels as “TOSA,” reproduced below, is replicated. *See e.g.*, Pet. 27; *but see* Pet. Reply 7, 10.



Ex. 1008, FIG. 1

Petitioner’s annotated version of Xiong’s Figure 1 depicts an arrow labeled “TOSA” pointing to laser chip 101, collimating lens 115, spot size converter 120, isolator 140, beam splitter 160, power/wavelength monitor 170, focusing lens 175, and fiber pigtail 190. Pet. 27. Whether a POSITA would have or could have replicated elements 101, 115, 120, 140, 160, 170, 175, and 190 in Xiong cited as teaching the TOSA arrangement is not the dispositive inquiry. The dispositive inquiry is whether Petitioner presented such position in the Petition. *See* 37 C.F.R § 42.104(b)(4) (“The petition must specify where each element of the claim is found in the prior art patents or printed publications relied upon.”).

Insofar we determine that Petitioner's second challenge is deficient on its face, we do not rely on Dr. Willner's testimony to support our findings and reach our ultimate conclusion as independent claim 11. Accordingly, we need not address Petitioner's *third* set of arguments concerning the reliability of Dr. Willner's testimony.

For the foregoing reasons, Petitioner does not sufficiently establish unpatentability, by a preponderance of the evidence, of independent claim 11 under 35 U.S.C. § 103 as being obvious over Wang in view of knowledge of skill in the art, as exemplified by Xiong.

3. Analysis of Claims 12–19

Each of claims 12–19 depends, directly or indirectly, from independent claim 11. We do not discern that Petitioner's challenges to dependent claims 12–19 cure the deficiencies noted above with respect to independent claim 11. Accordingly, we reach the same conclusion with respect to these claims as we reach with respect to independent claim 11. For the foregoing reasons, Petitioner does not sufficiently establish that any of dependent claims 12–19 are unpatentable under 35 U.S.C. § 103 as obvious over Wang in view of knowledge of skill in the art, as exemplified by Xiong, by a preponderance of the evidence.

III. CONCLUSION

For the reasons discussed above, Petitioner does not establish by a preponderance of the evidence that claims 1–10 are unpatentable under 35 U.S.C. § 102 as anticipated by Wang. Petitioner also does not establish by a preponderance of the evidence that claims 11–19 are unpatentable under 35 U.S.C. § 103 as obvious over the combination of Xiong and Wang.

In summary:

Claim(s)	35 U.S.C. §	Reference(s)/Basis	Claim(s) Shown Unpatentable	Claim(s) Not shown Unpatentable
1–10	102	Wang		1–10
11–19	103	Wang, Xiong		11–19
Overall Outcome				1–19

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has not established, by a preponderance of evidence, that any of challenged claims 1–10 of the '690 patent are unpatentable as anticipated under 35 U.S.C. § 102;

FURTHER ORDERED that Petitioner has not established, by a preponderance of evidence, that any of challenged claims 11–19 of the '690 patent are unpatentable as obvious under 35 U.S.C. § 103; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to this proceeding seeking judicial review of this Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CAMBRIDGE INDUSTRIES USA, INC., and
ACCELIGHT TECHNOLOGIES, INC.
Petitioner,

v.

APPLIED OPTOELECTRONICS, INC.,
Patent Owner.

IPR2025-00437
Patent 10,788,690 B2

AHMED, *Administrative Patent Judge*, concurring.

I join the entirety of the majority's opinion. I write separately to provide some additional views as to Petitioner's Ground 1 challenge to claims 1–10 and specifically as to Petitioner's contention that Wang discloses limitation 1[c].

Reproduced below are the entirety of Petitioner's contentions as to limitation 1[c] on Ground 1.

[1c] Wang discloses multiple optical isolators are mounted on the base in a substantially parallel arrangement relative to each other with an adhesive, such that the adhesive fills any gaps between the optical components and the base to control accuracy of the positioning of the isolators. Ex. 1005; 1006 ¶¶ [0041], [0043]; Ex. 1003, ¶ 75. Wang further teaches that its opto-isolator array achieves a compact product with improved accuracy of spacing between the isolators for multi-

channel applications. Ex. 1005; Ex. 1006, ¶¶ [0008]–[0011], [0041], [0043]; Ex. 1003, ¶ 73.

Pet. 16. The two paragraphs of Wang that Petitioner cites say *nothing* about a parallel arrangement of optical isolators—all they disclose is that isolators are sequentially disposed on the base. *See* Ex. 1006 ¶¶ 41, 43. And aside from the citation to paragraph 43, Petitioner does not expressly rely on Figure 6 as showing a parallel arrangement.⁷ Merely repeating the claim language and pointing generally to portions of a prior art reference when those disclosures are *silent* as to the claim limitation cannot be sufficient to meet Petitioner’s burden to show that the reference actually discloses the claim limitation. Instead, our rules require that a petition specify with particularity where each element of a claim is found in the prior art, and include a detailed explanation of the relevance of the prior art to the claim. 37 C.F.R. § 42.104(b)(4) (“[t]he petition must specify where each element of the claim is found in the prior art patents or printed publications relied upon”); *id.* § 42.22(a)(2) (“[e]ach petition . . . must include . . . a detailed explanation of the significance of the evidence including material facts”); *id.* § 42.104(b)(5) (the petition must “identify . . . the relevance of the evidence to the challenge raised, including identifying specific portions of the evidence that support the challenge”). As the Federal Circuit has explained, “[i]n an IPR, 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) (emphasis added). The burden never shifts to Patent Owner to show that the claims are

⁷ Petitioner also cites to Dr. Kirk’s declaration, but the cited paragraph simply mirrors the Petition. *See* Ex. 1003 ¶ 74. Dr. Kirk’s testimony therefore adds nothing as to the parallel limitation.

patentable or to respond during trial where Petitioner has not made its case. *In re Magnum Oil Tools Intl., Ltd.*, 829 F.3d 1364, 1376 (Fed. Cir. 2016).

Petitioner also cannot expect the Board to parse through the petition and construct arguments that Petitioner did not specifically present as to how Wang discloses the parallel arrangement of isolators. *See Parus Holdings, Inc. v. Google LLC*, 70 F.4th 1365, 1372 (Fed. Cir. 2023) (“The burden of production cannot be met without some combination of citing the relevant record evidence with specificity and explaining the significance of the produced material in briefs.”); *General Access Solutions, Ltd. v. Sprint Spectrum L.P.*, 811 F. App’x 654, 657 (Fed. Cir. 2020) (explaining that the Board should not be forced to play archaeologist with the record).

Even if I were to agree that Petitioner has sufficiently relied on Figure 6 of Wang in its contentions as to limitation 1[c], the Federal Circuit has cautioned against relying on patent drawings not drawn to scale to show specific arrangements or particular sizes. *See Nystrom v. TREX Co., Inc.*, 424 F.3d 1136, 1149 (Fed. Cir. 2005); *see also Hockerson-Halberstadt, Inc. v. Avia Group Int’l, Inc.*, 222 F.3d 951, 956 (Fed. Cir. 2000) (“it is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue”); *Regents of Univ. of California v. Satco Products, Inc.*, No. 2023-1356, 2024 WL 4972639, at *4 (Fed. Cir. Dec. 4, 2024) (finding that the Board erred by relying on bold lines in a prior art drawing to make findings regarding the *relative thickness* of metal leads). Whether two structures are parallel to each other requires disclosure with some level of precision similar to showing particular sizes or thickness; after all, the term *parallel* requires measurement of distance between two lines at all points.

Here, nothing in Wang indicates that its figures are drawn to scale or intended to depict precise arrangements. Instead, the optical isolators shown in Figure 6 of Wang could just as well demonstrate only the existence of separate structures that form a specific embodiment of the device. As paragraph 43 of Wang makes clear, Figure 6 is intended to show how the base, the baffles, and isolators are structured together, not to depict a parallel arrangement of the isolators. An inference from Figure 6, absent any supporting evidence, that the isolators are in a parallel arrangement is far from the clear disclosure that an anticipation finding requires. *See Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008) (“[A]nticipation requires the presence in a single prior art disclosure of all elements of a claimed invention *arranged as in the claim.*”); *see also TF3 Ltd. v. Tre Milano, LLC*, 894 F.3d 1366, 1374 (Fed. Cir. 2018) (“Claims cannot be anticipated by devices that are not the same. Invalidity for anticipation requires that the identical invention must be shown in *as complete detail* as contained in the patent claim.” (internal quotations omitted) (emphasis added)).

I am therefore not persuaded that Petitioner has proven by a preponderance of the evidence that Wang anticipates claims 1–10.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CAMBRIDGE INDUSTRIES USA, INC., and
ACCELIGHT TECHNOLOGIES, INC.
Petitioner,

v.

APPLIED OPTOELECTRONICS, INC.,
Patent Owner.

IPR2025-00437
Patent 10,788,690 B2

DANG, *Administrative Patent Judge*, dissenting in part.

I join my colleagues in the decision that Petitioner has not established, by a preponderance of evidence, that any of challenged claims 11–19 of the ’690 patent is unpatentable as obvious under 35 U.S.C. § 103. I respectfully dissent from the Majority’s decision that Petitioner has not established, by a preponderance of evidence, that any of challenged claims 1–10 of the ’690 patent is unpatentable as anticipated under 35 U.S.C. § 102.

DISCUSSION

Under “Ground 1” of the Petition, Petitioner contends that claim 1–10 of the ’690 patent are unpatentable as anticipated by Wang. Pet. 15–16.

The invention as set forth in challenged claims 1–10 of the ’690 patent is generally directed to an “optical isolator array.” Ex. 1001, code (57).

Figure 2 of the '690 patent, showing a perspective view of an optical isolator array for use in an optical transceiver (*id.* at 1:53–55), is reproduced below.

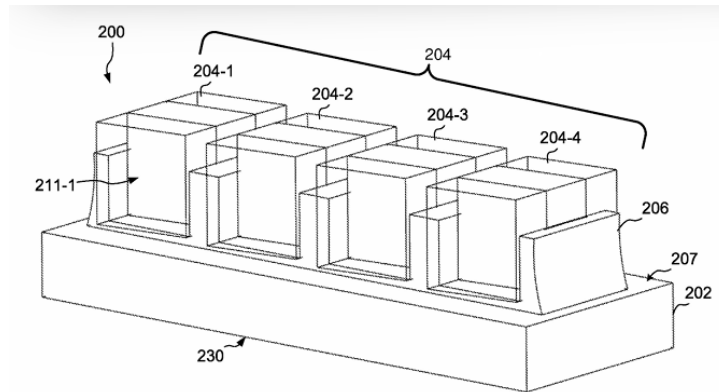


Figure 2 of the '690 patent shows optical isolator array 200 comprising magnetic base 202 and optical isolators 204 disposed thereon.

Among its showing of unpatentability of claims 1–10, Petitioner relies on Figure 6 of Wang (Pet. 15–16), reproduced below.

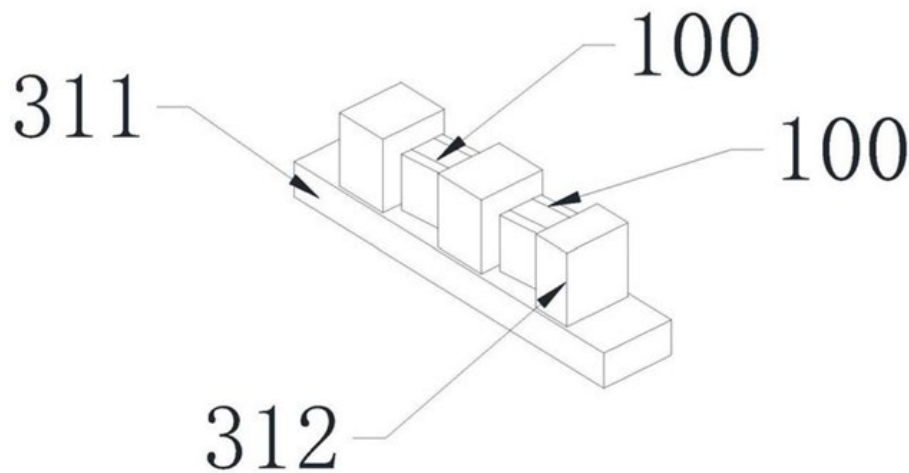


Figure 6 of Wang shows an optical isolator array that includes base 311 and optical isolators 100 disposed thereon.

During Oral Hearing, Petitioner presented Figure 2 of the '690 patent as showing the features of claim 1 (*see* Tr. 5:17–20 (“Claim 1 of the '690 patent calls for an opt-isolator array . . . in Figure 2 here of the '690 patent”))

as a side-by-side comparison of Figure 6 of Wang (*see* Tr. 6:3–7 (“as you can see, this is Figure 6 of the Chinese patent, . . . it shows a multichannel isolator device”)). However, during Oral Hearing, the counsel of record had difficulty differentiating the invention as illustrated in Figure 2 of the ’690 patent and Figure 6 of Wang, when presenting to the Panel:

JUDGE ULLAGADDI: It appears that in Figure 6 the baffles are taller than the isolators, and in Figure 2 the baffles are shorter than the isolators. Are these two different embodiments?

MR. PISANO: They are two different embodiments, but they are for the -- well, in Figure 2 -- sorry. Figure 2 is from the ’690 patent. Figure 6 is from the -- oh, my goodness, I may have to take this down. Figure 6 is from the Chinese patent.

JUDGE ULLAGADDI: Okay.

MR. PISANO: So, *although they look identical*, they're not. *These figures are from different patents. Hence the anticipation claim here.* Which is maybe a reason why *Patent Owner did not challenge the invalidity of Claims 1 through 10*. So if you line them up here -- now I'm on Slide 5.

If you put Figure 2 from the '690 patent on one side and Figure 6, which is the Chinese patent, on the other side

Tr. 6:19–7:11 (emphasis added).

Our reviewing court has said, “[d]escription for the purposes of anticipation can be by drawings alone as well as by words.” *In re Mraz*, 455 F.2d 1069, 1072 (CCPA 1972) (citation omitted). The drawings must be evaluated for what they reasonably disclose and suggest to one of ordinary skill in the art. *In re Aslanian*, 590 F.2d 911, 914 (CCPA 1979) (citations omitted). Here, I find that simple observation of Figure 6 of Wang would reveal to a person of ordinary skill in the that Wang’s plurality of optical

isolators are mounted to a mounting surface, with each of the plurality of optical isolators disposed “substantially” in parallel relative to each other, similar to the isolators shown in Figure 2 of the ’690 patent. *Compare* Wang, Fig.6 (isolators 100), *with* Ex. 1001, Fig. 2 (isolators 204).

For at least this reason, I disagree with the Majority that Petitioner has failed to establish, by a preponderance of evidence, that at least claim 1 of the ’690 patent is unpatentable as anticipated by Wang under 35 U.S.C. § 102.

I elaborate further and address some points highlighted by the Majority.

As shown in its Figure 2 above, the ’690 patent discloses optical isolator array 200 that includes magnetic base 202 and plurality of optical isolators 204, wherein a plurality of sidewalls define magnetic base 202 and first mounting surface 207. Ex. 1001, 5:46–58. According to the ’690 patent, an optical transceiver consistent with embodiments of the invention includes “a multi-channel transmitter optical subassembly (TOSA) arrangement.” *Id.* at 4:13–24.

Relying on its expert’s evidentiary testimony for support, Petitioner argues that Wang similarly discloses “a multichannel optical isolator array.” Pet. 15 (citing Ex. 1005; Ex. 1006 ¶¶ 8–11; Ex. 1003 ¶ 71). In particular, Petitioner contends that Wang discloses “a substrate with multiple channels and a plurality of isolators disposed in the respective channels.” *Id.* at 10–11 (citing Ex. 1005; Ex. 1006 ¶¶ 8–11, 37–39; Ex. 1003 ¶¶ 60, 71). As the Majority also points out, Petitioner provides an annotated version of Wang’s Figure 6, reproduced below:

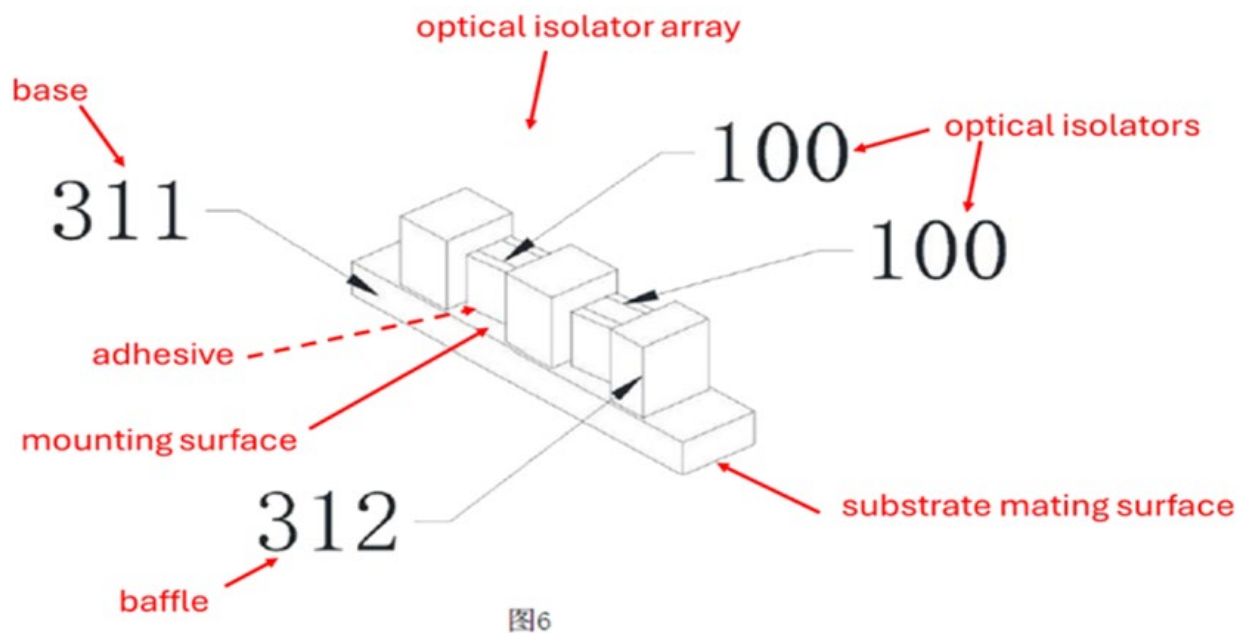


图6
Ex. 1005, FIG. 6 (annotated)

Petitioner's annotated version of Wang's Figure 6 is a perspective schematic view of a first embodiment disclosed in Wang and depicts optical isolators 100 on base 311 and separated by baffles 312. Pet. 11; *see* Ex. 1006 ¶ 45. According to Petitioner, "Wang includes a base that defines at least one mounting surface for the optical isolator array," wherein "[t]he multiple optical isolators are bonded to the base, in between baffles, by adhesive in a substantially parallel arrangement relative to each other." Pet. 12 (citing Ex. 1005, Figs. 6, 8, 10; Ex. 1006 ¶¶ 14, 40, 41, 43; Ex. 1003 ¶ 61). In particular, Petitioner asserts that "Wang discloses multiple optical isolators are mounted on the base in a substantially parallel arrangement relative to each other with an adhesive," wherein such "opto-isolator array achieves a compact product with improved accuracy of spacing between the isolators for multi-channel applications." *Id.* at 16 (citing Ex. 1005; Ex. 1006 ¶¶ 8–11, 41, 43; Ex. 1003 ¶¶ 73, 75).

I agree with my colleagues that, for an anticipation ground, Petitioner is required to show that the reference discloses not only the elements of the claimed invention, but also discloses those elements as arranged in the claim. *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008). However, contrary to the Majority's conclusion, I am persuaded that Petitioner has sufficiently shown the elements of claim 1 as arranged in the claim, and in particular, limitation 1(c) highlighted by the Majority, reciting "a plurality of optical isolators mounted to the at least one mounting surface, each of the plurality of optical isolators disposed substantially in parallel relative to each other." Ex. 1001, 9:26–28.

In the Petition, citing to, *inter alia*, Figures 6, 8, and 10 of Wang and relying on its expert's evidentiary testimony for support, Petitioner contends that "Wang includes a base that defines at least one mounting surface for the optical isolator array," wherein "[t]he multiple optical isolators are bonded to the base, in between baffles, by adhesive in a substantially parallel arrangement relative to each other." Pet. 12. In particular, citing to paragraphs 41 and 43 of Wang and Dr. Kirk's declaration at paragraph 61, Petitioner asserts that "Wang discloses multiple optical isolators are mounted on the base in a substantially parallel arrangement relative to each other with an adhesive" (*id.* at 16), wherein paragraph 43 of Wang states, "As shown in Figs. 5 and 6, the present utility model provides Preferred Embodiment 1 of the substrate." I am persuaded by Petitioner's reliance on at least Figure 6 of Wang, for example, for showing "a plurality of optical isolators mounted to the at least one mounting surface, each of the plurality of optical isolators disposed substantially in parallel relative to each other," as recited in claim 1. That is, I am persuaded that, to a person of ordinary skill in the art, in simple observation, Figure 6 of Wang also shows isolators

baffles/sidewalls and isolators sequentially disposed on the base in a parallel manner, similar to Figure 2 of the '690 patent.

Thus, I am persuaded by Petitioner's contention that although Figure 6 of Wang and Figure 2 of the '690 patent look similar, "[t]hese figures are from different patents. Hence the anticipation claim here." Tr. 7:2–3.

Although the Majority finds that Petitioner's showing is not sufficiently persuasive as to how Wang's isolators "*necessarily*" disclose that the isolators are "disposed substantially in parallel relative to each other," a showing of whether an *unstated* feature is necessarily present is required *if a prior art reference is silent about an asserted characteristic or limitation*. See *Continental Can Co. USA v. Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1991). Here, Petitioner is asserting explicit disclosure and is not relying on inherency anticipation ground, i.e., Petitioner is not asserting that Wang is silent about an asserted inherent characteristic, wherein a gap in the reference is to be filled with recourse to extrinsic evidence. In particular, Petitioner specifically points to Figure 6, *inter alia*, for explicit disclosure of a substantially parallel arrangement, contending that Wang shows that the isolators are positioned "by adhesive in a substantially parallel arrangement relative to each other." Pet. 12.

Written description support may include not only the Specification, but also Appellant's drawings. See *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1564 (Fed. Cir. 1991) (explaining that drawings may provide written description of an invention). I am persuaded by Petitioner that Wang discloses the substantially parallel arrangement as claimed. As an initial matter, I note that claim 1 does not require a parallel arrangement but rather a "substantially parallel" arrangement of isolators. I find that a simple

observation of Figure 6 of Wang clearly shows a substantially parallel arrangement of isolators.

Although the Majority also finds that “the cited portion in Figure 6 of Wang apparently *shows* a *possibly* parallel arrangement of isolators,” the Majority appears to regard a feature that is shown in the drawings as merely “possibly” shown. Although patent drawings not designated as being drawn to scale cannot be relied upon to define precise proportions of elements if the specification is completely silent on the issue (*Hockerson-Halberstadt, Inc. v. Avia Group Int’l, Inc.*, 222 F.3d 951, 956 (Fed. Cir. 2000)), that does “not mean that things patent drawings show clearly are to be disregarded.” *Mraz*, 455 F.2d at 1072 (emphasis omitted). A drawing discloses all that it reasonably discloses and suggests to a person of ordinary skill in the art. *Aslanian*, 590 F.2d at 914. Here, whether the isolators are disposed in a “substantially parallel” arrangement can be disclosed through observation. As our reviewing court noted, although patent drawings are not working drawings, “we did not mean [in *In re Wilson*, 312 F.2d 449, 454 (CCPA 1963)] that things patent drawings show clearly are to be disregarded.” *Mraz*, 455 F.2d at 1072 (emphasis omitted). And as the Federal Circuit guided, “drawings can be used as prior art, without referring to the surrounding description, . . . if the prior art features are clearly disclosed by the drawing.” *PlaSmart, Inc. v. Kappos*, 482 F. App’x 568, 572 (Fed. Cir. 2012).

Furthermore, as Petitioner pointed out during Oral Hearing, although it has shown that Figure 6 of Wang and Figure 2 of the ’690 (illustrating the features of claims 1–10) are “identical,” “[h]ence the anticipation claim here,” “Patent Owner did not challenge the invalidity of Claims 1 through 10.” Tr. 7:4–5. That is, Patent Owner’s Response and Patent Owner’s

expert testimony from Dr. Willner do not even address Petitioner's showing of unpatentability in Ground 1 with respect to claims 1–10. *See* PO Resp.; Ex. 2004. In fact, during deposition, when asked specifically about claims 1–10, Patent Owner's expert, Dr. Willner testified that his opinions are related to claims 11–19 only. *See* Ex. 1014, 14:3–12 (“A. I was not asked to give an opinion about Claims 1 to 10. . . . I believe that my opinions are related to Ground 2 . . . of the petition.”). Thus, Petitioner's showing of unpatentability with respect to claims 1–10, including the supporting evidentiary testimony of Dr. Kirk (Ex. 1003), are un rebutted by Patent Owner. Although 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)), in *Google v. Ji-Soo Lee*, where Patent Owner offered no rebuttal evidence, the Federal Circuit found that the Petitioner had shown that the element was taught and provided un rebutted testimony supporting that argument. *See Google LLC v. Ji-Soo Lee*, 759 F. App'x 992, 997 (Fed. Cir. 2019) (“Based on Google's showing, and the absence of any rebuttal evidence from Lee, the only conclusion supported by the evidence is that Degawa teaches the disputed limitation.”). Here, based on Petitioner's showing, and the absence of any rebuttal evidence from Patent Owner, I am persuaded that the only conclusion supported by the evidence is that Wang discloses the disputed limitation.

For the foregoing reasons, I find that Petitioner has established, by a preponderance of evidence, at least claim 1 of the '690 patent is unpatentable as anticipated by Wang under 35 U.S.C. § 102.

IPR2025-00437
Patent 10,788,690 B2

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