

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CAMBRIDGE INDUSTRIES USA, INC.,

Petitioner

v.

APPLIED OPTOELECTRONICS, INC.,

Patent Owner

Case: IPR2025-00437

U.S. Patent No. 10,788,690

**PETITION FOR *INTER PARTES* REVIEW UNDER 35 U.S.C. §§ 311–319
AND 37 C.F.R. § 42.104**

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TABLE OF EXHIBITS

Exhibit	Short Name	Description
Ex. 1001	'690 Patent	U.S. Patent No. 10,788,690
Ex. 1002	'690 Patent File History	File History of U.S. Patent No. 10,788,690
Ex. 1003	Kirk Declaration	Expert Declaration of Dr. Andrew G. Kirk
Ex. 1004	Kirk CV	<i>Curriculum Vitae</i> of Dr. Andrew G. Kirk
Ex. 1005	Wang	Chinese Patent No. 208421455U
Ex.1006	—	Wang English translation
Ex. 1007	Hata	U.S. Patent App. Pub. No. US 2003/0053208 A1
Ex. 1008	Xiong	U.S. Patent No. 9,563,073
Ex. 1009	Yoshie	U.S. Patent App. Pub. No. US 2010/0002988A1
Ex. 1010	Ye	U.S. Patent App. Pub. No. US 2014/0146389A1
Ex. 1011	Scheduling Order	Doc. No. 30, Scheduling Order, <i>Applied Optoelectronics, Inc. v. Cambridge Industries USA, Inc.</i> , No. 3:24-cv-01010-JD (N.D. Cal.)

Cambridge Industries USA, Inc. (“Petitioner” or “CIG USA”) petitions for *Inter Partes* Review (“IPR”) under 35 U.S.C. §§ 311–319 and 37 C.F.R. § 42 of Claims 1–19 (“the Challenged Claims”) of U.S. Patent No. 10,788,690 (the “’690 Patent”). Petitioner requests cancellation of the Challenged Claims.

I. STANDING UNDER 37 C.F.R. § 42.104(a)

Petitioner certifies that the ’690 Patent is available for IPR, and that Petitioner is not barred or estopped from requesting IPR.

II. PAYMENT OF FEES

Petitioner authorizes Account No. 19-5029 to be charged for any fees.

III. OVERVIEW OF CHALLENGES AND RELIEF REQUESTED

Pursuant to § 42.22(a)(1) and § 42.104(b)(1)–(2), Petitioner requests cancellation of the Challenged Claims pursuant to the grounds below.

Ground 1: Claims 1–10 are unpatentable under 35 U.S.C. § 102 as anticipated by Wang.

Ground 2: 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.

IV. BACKGROUND

A. Technical Background

Optical transceivers are optical data communication modules used to facilitate high-speed transmission and receipt of optical signals in a range of

applications (e.g., high-speed internet and broadband television). *See* Ex. 1001, 1:15-21. Optical transceivers generally include optical subassembly modules such as TOSAs and/or ROSAs. *See id.* at 1:29-35. Components of such optical subassembly modules typically include arrays of optical isolators configured to optically communicate with other components of the optical transceivers, such as laser diodes of TOSAs or photodiodes of ROSAs, within the optical circuits. Ex. 1003, ¶ 39.

Optical communications circuits often have limited usable space available. Consequently, optical circuit component designs seek to optimize the dimensions of such circuit components. Ex. 1003, ¶ 40. Moreover, given the precise nature of underlying optical data communications, optical subassembly modules and their respective components (e.g., optical isolator arrays) are typically designed and arranged to minimize the extent to which individual component adjustments are required and to facilitate propagation of light in preferred directions with high accuracy. *Id.*

Optical isolators and associated components use magnetic fields, for example, generated by magnetic materials, to propagate light incident to the optical isolators in a preferred direction with predictable results. *See generally*, Ex. 1009, ¶ [0018]; Ex. 1010, ¶ [0010]; Ex. 1003, ¶ 41. As was understood by POSITAs in the field of optical communications, transmission and receipt of optical data

requires reliable and uninterrupted optical signal transmission. Ex. 1003, ¶ 41. It was well-known to POSITAs in the field of optical communications in January 2019 that magnetic fields could be used to orient light propagation in preferred directions (e.g., by utilizing the Faraday effect) and to prevent back reflections that could damage the lasers. *See* Ex. 1009, ¶ [0002]. POSITAs also understood that the magnetic fields needed for such purposes could readily be generated by permanent magnetic materials. Ex. 1003, ¶ 41.

Prior to the filing of the '690 Patent, optical transceivers including transmitter optical subassembly ("TOSA") and/or receiver optical subassembly ("ROSA") modules also were well-known to persons of ordinary skill in the art ("POSITAs") of optical data communications. Ex. 1008, 1:17-36; Ex. 1003, ¶ 42. Such optical subassembly modules typically included optical isolators arranged to optically communicate with various other components (e.g., lasers or photodiodes) of the optical subassembly modules or their respective associated optical transceivers. Ex. 1003, ¶ 42.

The design of each such optical subassembly module (including the mounting and arrangement of optical isolators and other associated components) generally was selected to optimize the form factor of the module while minimizing the number of adjustments required to install the module in an optical component. Ex. 1003, ¶ 43. For example, an array of optical isolators could be secured in a compact arrangement

on a modular base, thus reducing the number of adjustments needed to align the optical isolators with respect to other optical components when available space is limited (e.g., by the physical volume of a transceiver housing). *Id.*

B. Overview of the '690 Patent

The '690 Patent describes and claims an optical isolator array for use in an optical subassembly module (e.g., a TOSA of an optical transceiver). Ex. 1001, Abstract. The optical isolator array includes a magnetic base to support a plurality of optical isolators, which are secured by an adhesive in a predefined arrangement relative to one another, to thereby facilitate alignment with respect to other components of the associated optical transceiver. *See* Ex. 1001, 3:4–35; Ex. 1003, ¶ 44.

More specifically, 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, Abstract. Further, “the 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.*; Ex. 1003, ¶ 45.

The magnetic base has a preferred number of optical isolators mounted thereon and “uniformly disposed along the same axis on the magnetic base and at a distance D from adjacent optical isolators.” Ex. 1001, Abstract. The optical isolators

are secured to the magnetic base in a predefined arrangement by “[a]n 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.*, 1:9-11. No specific material compositions or characteristics for the opto-isolator components are specified in the claims of the ’690 Patent, other than that the mounting surface comprise a magnetic material and that the optical components be glued in place with a UV-curable adhesive. Ex. 1003, ¶¶ 46-47.

As demonstrated by the prior art discussed in this Petition, the ’690 Patent is directed to structures that were well-known to POSITAs in the optical communications field at the time of the alleged invention of the ’690 Patent. Ex. 1003, ¶ 48. As further demonstrated by the prior art discussed herein, gluing arrays of opto-isolators to a common magnetic mounting surface also was known before the alleged invention of the ’690 Patent.” *See* Ex. 1005, FIGS, 6, 8; 1006, Abstract. Accordingly, the Board should institute review because there is a strong likelihood that Petitioner will prevail on at least one Challenged Claim.

C. '690 Patent Prosecution History

Patent Owner Patent Owner filed U.S. Patent Application No. 16/257,635 (the “'635 Application”) on January 25, 2019. Ex. 1002, p. 35.

Prior to issuance of a substantive Office action, an Examiner-Initiated Interview was conducted on June 30, 2020, during which the Patent Examiner proposed an Examiner’s Amendment to correct dependent application claims 8 and 17 such that each claim would recite “substrate mating surface” rather than “substrate mounting surface.” Ex. 1002, pp. 21-22. Patent Owner’s representative agreed to those proposed Examiner’s Amendments. *Id.*; Ex. 1003, ¶ 50.

A Notice of Allowance was mailed on July 8, 2020, and included a Notice of Allowability. The Notice of Allowability referenced the June 30, 2020, Examiner’s Interview and incorporated the Examiner’s Amendment discussed during the June 30, 2019 telephone interview. With respect to independent Claim 1, the Notice of Allowability further stated:

[T]he prior art of record does not disclose or suggest an optical isolator array for use in an optical subassembly module, an optical isolator array for use in an optical subassembly module comprising 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 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, along with other claim limitations.

Ex. 1002, p. 15; Ex. 1003, ¶ 51.

Regarding independent Claim 11, the Notice of Allowability stated:

[T]he prior art of record does not disclose or suggest an optical transceiver, the optical transceiver comprising, a transceiver housing; at least one optical transmitter subassembly (TOSA) arrangement disposed in the transceiver housing, the at least one TOSA arrangement comprising, a substrate defined by at least one mounting surface; 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 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 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; an optical receiver subassembly (ROSA) disposed in the transceiver housing, along with other claim limitations.

Ex. 1002, p. 16; Ex. 1003, ¶ 52.

The dependent claims were allowed based on their respective dependencies from independent Claims 1 or 11. Ex. 1002, pp. 15-17; Ex. 1003, ¶ 53.

The Notice of Allowability cited two prior art references: Yoshie et al., US Patent Application Publication US 2010/0002988A1 and Ye, US Patent Application Publication US 2014/0146389A1. Ex. 1002, pp. 15-16, 22. The Examiner noted that neither Yoshie nor Ye teaches an optical isolator array as recited in Claim 1 or an optical transceiver as recited in Claim 11. *Id.* Instead, Yoshie and Ye each discloses structure for a *single* opto-isolator, not an array of such structures having a common mounting surface. *See generally*, Exs. 1009, 1010; Ex. 1003, ¶ 54.

The Issue Fee was submitted on August 25, 2020, Ex. 1002, pp. 2-6, and the '690 Patent issued on September 29, 2020, *id.*, p. 1; Ex. 1003, ¶ 55.

D. Priority Date

The '690 Patent does not claim the benefit of any prior-filed application. Accordingly, the earliest effective filing date of the '690 Patent is January 25, 2019. Ex. 1001, cover. The references relied upon in this Petition constitute prior art to the '690 Patent under at least 35.U.S.C. §102(a). All references herein to 35 U.S.C. §§ 102-103 are made with respect to the AIA versions thereof, which apply to the Challenged Claims.

E. Prior Decisions by District Courts or the Board

The '690 Patent is currently asserted in two pending district court cases in the Northern District of California: *Applied Optoelectronics, Inc. v. Cambridge Industries USA, Inc.*, No. 3:24-cv-01010-JD (N.D. Cal.) and *Applied Optoelectronics, Inc. v. Accelight Technologies, Inc.*, No. 3:24-cv-09041 (N.D. Cal.), filed December 13, 2024. No dispositive judgment or claim construction orders have been issued. A claim construction hearing in Patent Owner's litigation against Petitioner is currently set for April 10, 2025. Ex. 1011, p. 2. The dispositive motion deadline is currently set for January 28, 2026. *Id.* Jury trial is scheduled to begin on June 8, 2026. *Id.*

F. Claim Construction (37 C.F.R. § 42.100(b))

The claims are construed herein “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b).” 37 C.F.R. §42.100(b) (Nov. 13, 2018). Unless otherwise specified, the terms should receive their respective plain and ordinary meanings as understood by a person of ordinary skill in the art under *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005).

The language used in the claims of the ’690 Patent is self-explanatory and would have been recognized by a POSITA as having plain and ordinary meanings. As the claim terms appear understandable in the context of the disclosure provided by the specification of the ’690 Patent, Petitioner submits that no special constructions are required. Ex. 1003, ¶ 58.

V. PRIOR ART REFERENCES

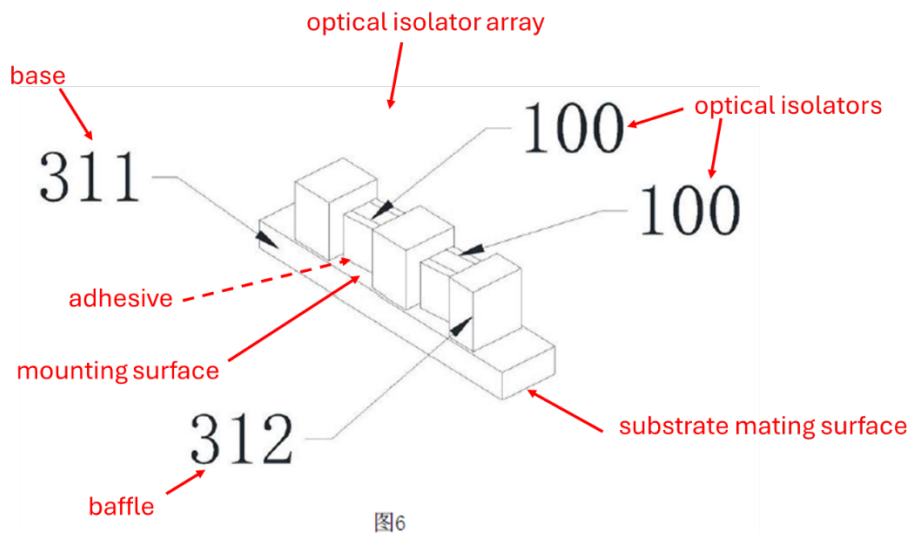
A. Chinese Patent No. CN 208421455U (“Wang”)

Wang, Ex. 1005, Ex. 1006 (English translation) was filed on July 20, 2018, and issued on January 22, 2019. Wang qualifies as prior art under at least AIA 35 U.S.C. § 102(a)(1). Wang was neither cited nor considered during prosecution of the ’635 Application that matured as the ’690 Patent. Ex. 1003, ¶ 59

Wang teaches 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. Ex. 1005; Ex. 1006, ¶¶ [0008]-[0011]; Ex. 1003, ¶ 60.

Specifically, the multi-channel isolator comprises 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. Ex. 1005; Ex. 1006, ¶¶ [0037]-[0039]; Ex. 1003, ¶ 60. All or part of the substrate is made of a magnetic material that can generate a magnetic field. Ex. 1005; Ex. 1006, ¶¶ [0012], [0040]; Ex. 1003, ¶ 60. Further, Wang teaches that the optical isolators are bonded to the substrate by adhesive. Ex. 1005; Ex. 1006, ¶¶ [0013]-[0014]; Ex. 1003, ¶60. The multi-channel opto-isolator therefore reduces the overall space requirement of the component, improves spacing accuracy between the isolators, and simplifies assembly. Ex. 1005; Ex. 1006, ¶ [0021]; Ex. 1003, ¶ 60.

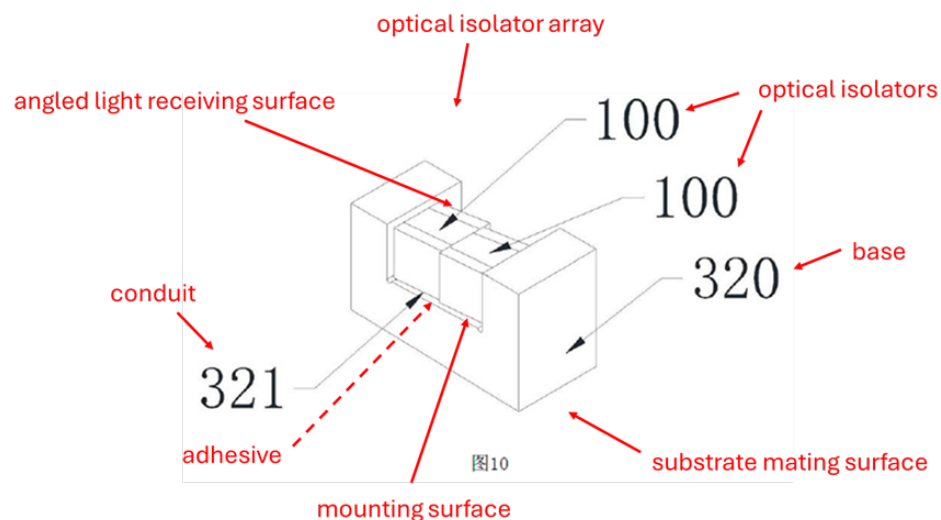
A first exemplary embodiment, as depicted in FIG. 6 of Wang is reproduced below. Ex. 1003, ¶ 60.



Ex. 1005, FIG. 6 (annotated)

The substrate disclosed in Wang includes a base that defines at least one mounting surface for the optical isolator array. Ex. 1005, FIGS. 6, 8, 10; Ex. 1006, ¶¶ [0014], [0040]. 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 control accuracy of the positioning of the isolators. Ex. 1005, 1006 ¶¶ [0041], [0043]. See Ex. 1003, ¶ 61.

As would be understood by a POSITA in January 2019, Wang discloses that the magnetic base is formed from a magnetic material capable of producing a magnetic field that intersects with the optical isolators to establish a direction of propagation, defined in part by polarizing film of each optical isolator. Ex. 1005, FIGS. 1, 6; Ex. 1006, ¶¶ [0019], [0038] Each optical isolator may further include a Faraday rotator. Ex. 1005, FIGS. 1, 6; Ex. 1006, ¶ [0042]; Ex. 1003, ¶ 62.



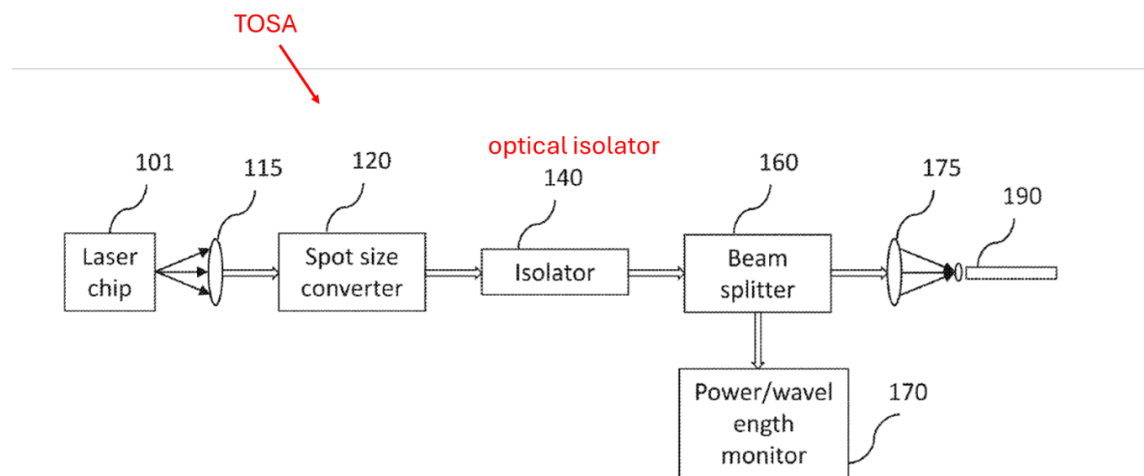
Ex. 1005, FIG. 10 (annotated)

As illustrated in FIG. 10 of Wang, reproduced above, the angled light receiving faces of the opto-isolators may be disposed at an angle to the incident light received from the lasers employed in the optical component into which the multi-channel opto-isolator of Wang is assembled. Ex. 1003, ¶ 63.

B. U.S. Patent No. 9,563,073 (“Xiong”)

Xiong, Ex. 1008, was filed on June 27, 2014, and issued on February 7, 2017. Xiong qualifies as prior art under at least AIA 35 U.S.C. § 102(a)(1). Xiong was neither cited nor considered during prosecution of the ’635 Application that matured into the ’690 Patent. Ex. 1003, ¶ 64.

Xiong teaches “[a]n integrated and compact multifunctional optical isolator” that is “suitable for use in a TOSA” of an optical transceiver, which may further include a ROSA. Ex. 1008, Abstract, 1:17-23. FIG. 1 of Xiong is reproduced below. Ex. 1003, ¶ 65.



Ex. 1008, FIG. 1 (annotated)

The optical isolator of Xiong “includes input optics including a first polarizer, a Faraday rotator, and a second polarizer” and utilizes magnetism (via the Faraday effect) to direct incident light passing through the TOSA and/or the associated optical transceiver. *Id.*, FIG. 7a, Abstract, 8:28-42, 10:50-64; Ex. 1003, ¶ 66.

Xiong describes an optical transceiver including a TOSA and a ROSA. Ex. 1008, FIG. 1, 1:17-23. As further described in Xiong, a TOSA includes a number of laser diodes that are each designed to emit a different associated channel wavelength along a corresponding light path. *Id.*, 1:24-65, 6:66-7:3. The TOSA is described as including at least one optical isolator, optically aligned with a corresponding laser diode via the corresponding light path, which utilizes the Faraday effect to propagate incident light in a preferred direction. *Id.* at FIG. 7a, 1:24-65, 6:66-7:3, 8:22-42; Ex. 1003, ¶ 67.

VI. LEVEL OF ORDINARY SKILL IN THE ART

A POSITA 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. Ex. 1003, ¶ 22. Individuals 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. *Id.* In some cases,

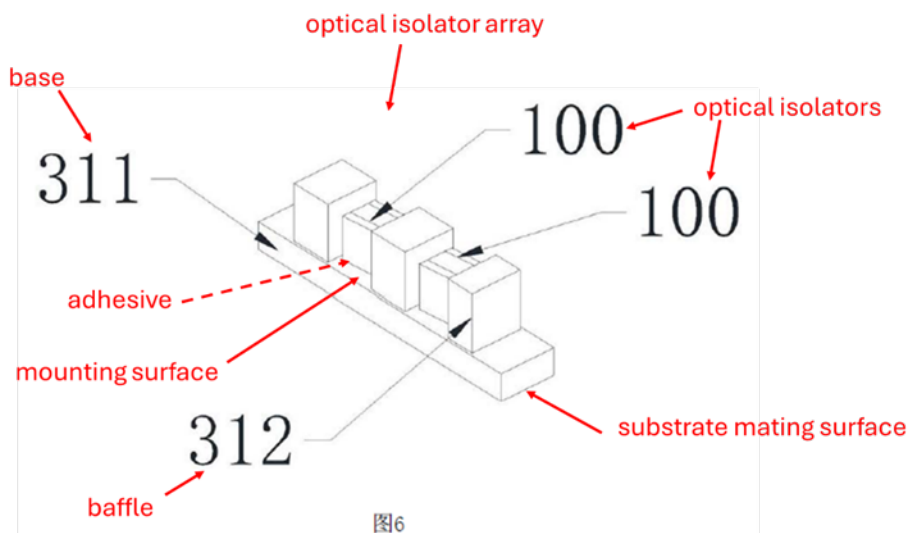
additional education might be an acceptable substitute for some experience, or vice versa. *Id.*

VII. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. Ground 1: Claims 1–10 Are Unpatentable Under 35 U.S.C. § 102 As Anticipated by Wang

1. Claim 1

[1a] 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. Ex. 1005; Ex. 1006, ¶¶ [0008]-[0011]; Ex. 1003, ¶ 71. FIG. 6 of Wang is reproduced below. *Id.*



Ex. 1005, FIG. 6 (annotated)

[1b] 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. Ex. 1005, FIG. 6; Ex. 1006, ¶¶ [0037]-[0039]. Wang further discloses that all or

part of the base is made of a magnetic material that can generate a magnetic field. Ex. 1005; Ex. 1006, ¶¶ [0012], [0040]; Ex. 1003, ¶ 72.

[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.

[1d] 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. Ex. 1005, FIGS. 6, 8, 10; 1006, ¶¶ [0013]-[0014]. In particular, 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. Ex. 1005; Ex. 1006 ¶¶ [0041], [0043]; *see also* Ex. 1003, ¶ 74.

For the foregoing reasons, a POSITA would have understood that Wang anticipates Claim 1. Ex. 1003, ¶ 75.



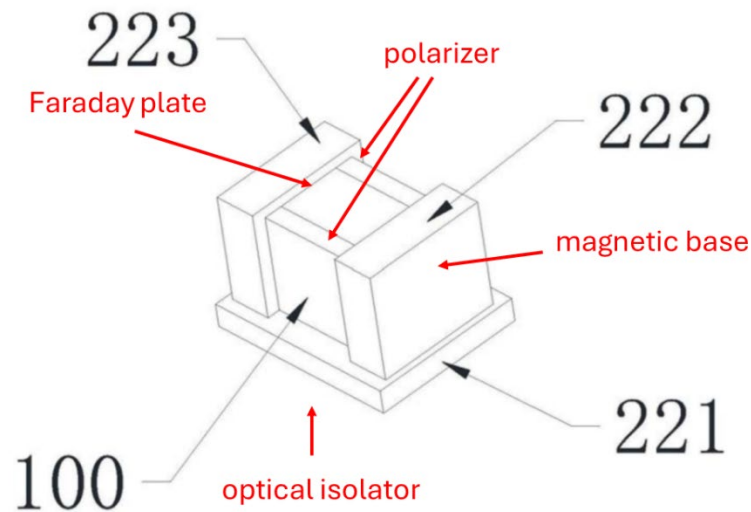
Claim 2

Wang discloses the magnetic base is formed at least in part from magnetic material that can produce a magnetic field. Ex. 1005, FIGS. 1, 6; Ex. 1006, ¶¶ [0019], [0038]. Wang further describes that each optical isolator may further include a Faraday rotator. Ex. 1005, FIGS. 1, 6; Ex. 1006, ¶ [0042]. A POSITA would have understood that opto-isolators necessarily require a magnetic field, that Faraday rotators magnets, and the conventional way of obtaining a magnetic field without requiring electric current is by using a permanent magnet. *See, e.g.*, Ex. 1008, 2:5-23 (referring to Faraday rotators); Ex. 1009, ¶¶ [0018], [0023]; Ex. 1010, ¶¶ [0003], [0014]; Ex. 1003, ¶ 76. Accordingly, as required by Claim 2, a POSITA would have understood that the magnetic field described in Wang is formed by a permanent magnet. Ex. 1003, ¶ 77.

2. *Claim 3*

Wang further discloses the magnetic base is formed from magnetic material capable of producing a magnetic field that intersects with the optical isolators to establish a direction of propagation defined in part by polarizing film of each optical isolator. Ex. 1005, FIGS. 1, 6; Ex. 1006, ¶¶ [0019], [0037], [0038]; Ex. 1003, ¶ 78. A POSITA would have understood that Wang discloses that the magnetic field generated by the base necessarily intersects with the optical isolators to establish a direction of propagation. *See, e.g.*, Ex. 1005, FIG. 3 (annotated below); Ex. 1006,

¶¶ [0037]-[0039]; Ex. 1003, ¶ 78.



Ex. 1005, FIG. 3 (annotated)

A POSITA would have understood that without such a magnetic field, the isolators would not perform their intended function. Ex. 1003, ¶ 79. Accordingly, as required by Claim 3, the magnetic base of Wang introduces a first magnetic field that intersects with the optical isolators to establish a direction of propagation. *Id.*, ¶ 79.

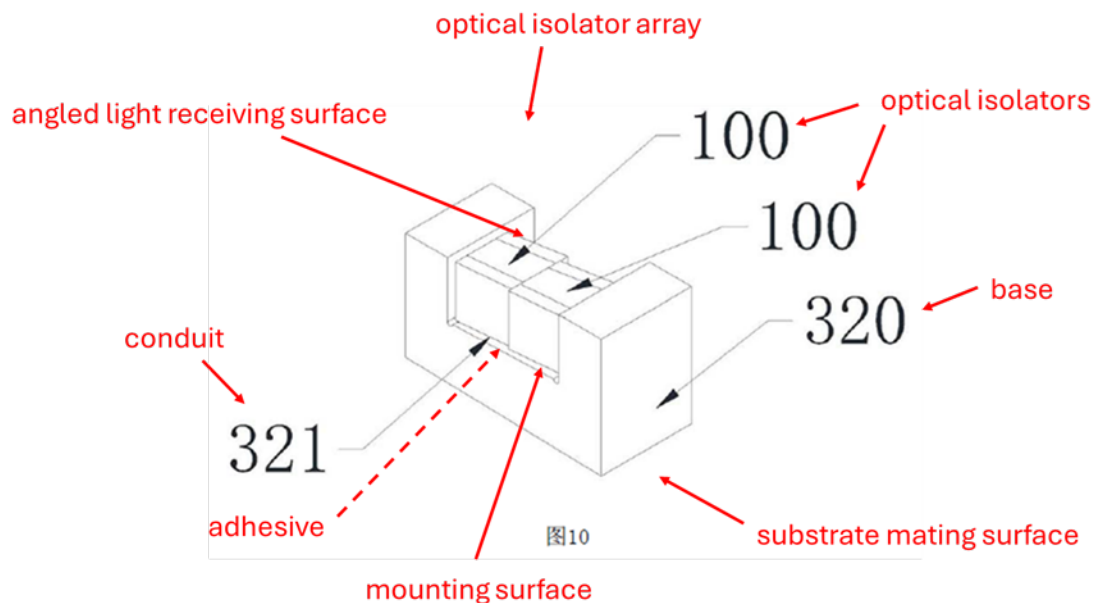
3. *Claim 4*

As discussed for Claim 3, above, and depicted in FIG. 3, Wang discloses each optical isolator includes a Faraday plate and thus constitutes a Faraday rotator. Ex. 1006, ¶¶ [0002], [0019], [0037]-[0039]; Ex. 1003, ¶ 81.

Accordingly, as required by Claim 4, a POSITA would have understood that each optical isolator of Wang includes a Faraday Isolator. Ex. 1003, ¶ 82.

4. *Claim 5*

51. Wang discloses each optical isolator includes an angled light-receiving surface to receive channel wavelengths from an associated laser diode. *See* Ex. 1005, FIG. 10 (reproduced below, showing that the light-receiving surfaces of the isolators 100 are angled relative to the incident light); Ex. 1003, ¶ 83.



Ex. 1005, FIG. 10 (annotated)

52. It was well-known in the field of opto-isolators, and a POSITA would have understood in January 2019, that the light-receiving surfaces of the opto-isolators in Wang would be angled relative to the incident light to reduce back reflection, although reducing such back reflection was an intended purpose of the opto-isolator. Ex. 1003, ¶ 84; *see also* Ex. 1007, FIG. 1, ¶ [0084] (describing groove in an optical isolator that is “inclined at a predetermined angle with respect to [a]

light beam axis of [an] optical fiber . . . so as to remove return lights”); *see also* Ex. 1008, 1:62-2:4; Ex. 1009, ¶ [0002]; Ex. 1003, ¶ 84.

53. Accordingly, as required by Claim 5, a POSITA would have understood that each optical isolator included an angled light-receiving surface to receive channel wavelengths from an associated laser diode. Ex. 1003, ¶ 85.

5. Claim 6

Wang discloses the optical isolators are uniformly arranged across the mounting surface(s) of the base (e.g., in one or more channels provided on the base). *See* Ex. 1005, FIGS. 6, 8 (reproduced below), FIG. 10; Ex. 1006, Abstract, ¶¶ [0021], [0044], [0046]; Ex. 1003, ¶ 86.

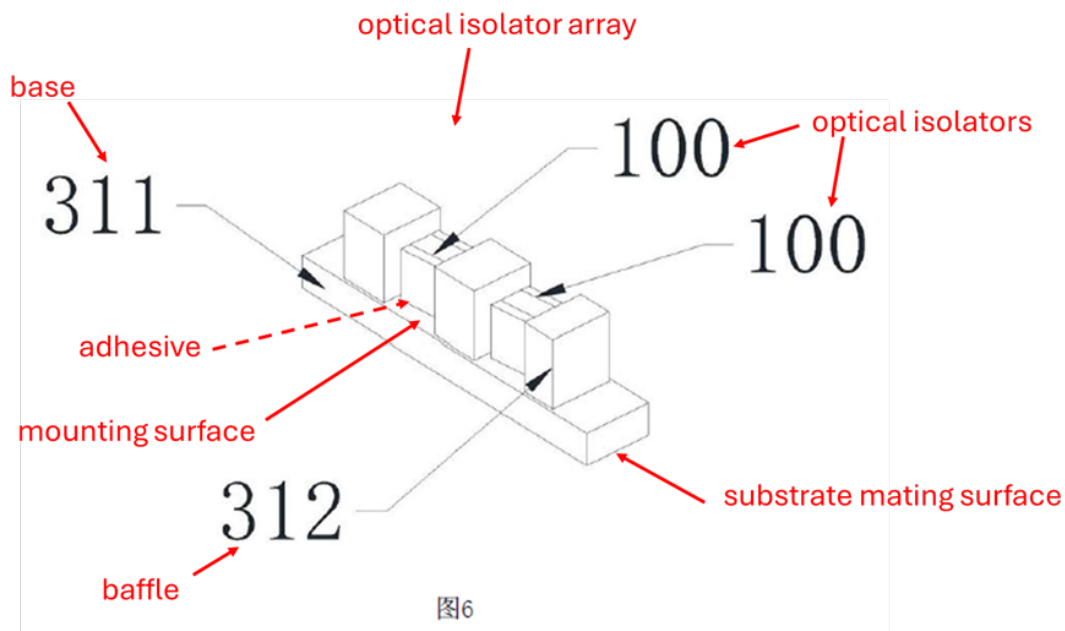


FIG. 1005, FIG. 6 (annotated)

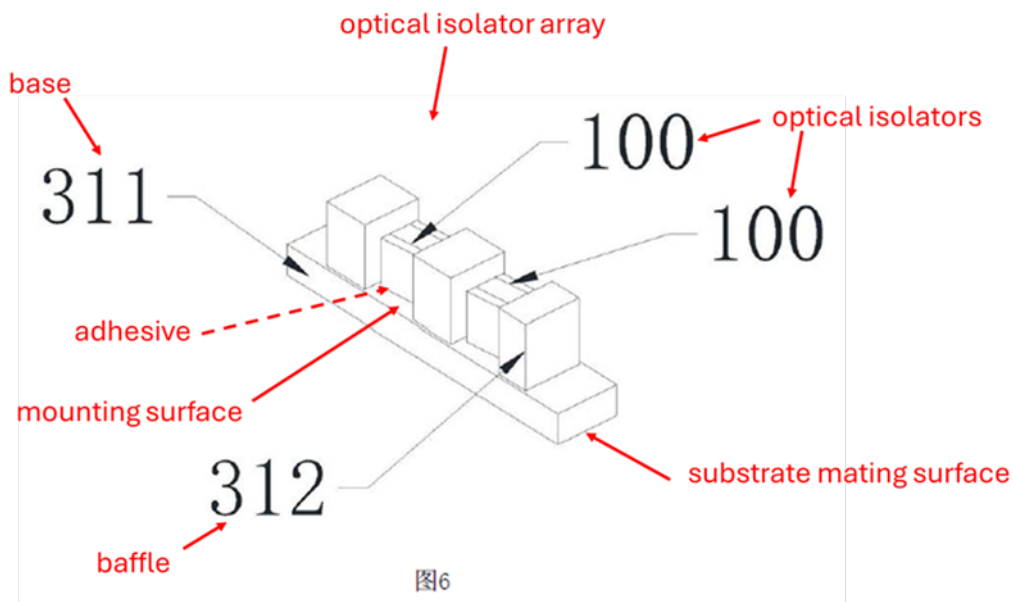


FIG. 1005, FIG. 8 (annotated)

As required by Claim 6, a POSITA would have understood that Wang discloses optical isolators disposed uniformly across on the mounting surface. Ex. 1003, ¶ 87.

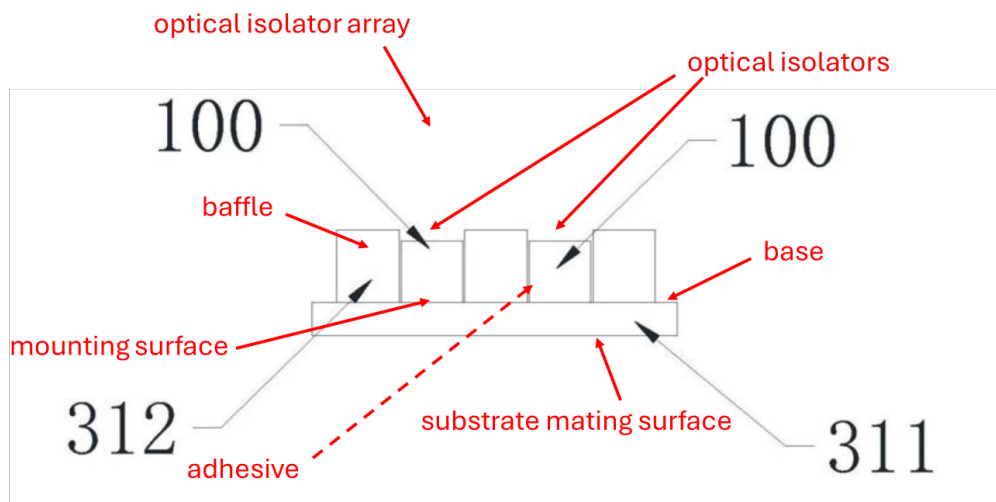
6. *Claim 7*

Wang further discloses the layer(s) of adhesive may be applied between adjacent optical isolators, which may be located within a channel on the base. *See* Ex. 1005, FIGS. 5, 6; Ex. 1006, ¶ [0044] (referring to FIGS. 5 and 6, “The substrate includes a base 311, and baffles 312 and isolators 100 [are] sequentially disposed on the base 311. Any adjacent ones of the baffles 312 and the base 311 form a channel for accommodating the isolator 100. The isolator 100 is separately bonded to the baffles 312 and the base 311 by means of an adhesive.”); Ex. 1003, ¶ 88.

Accordingly, as required by Claim 7, the layer(s) of adhesive are disposed between adjacent optical isolators. Ex. 1003, ¶ 89.

7. *Claim 8*

Wang further discloses the magnetic base includes a substantially flat substrate mating surface (e.g., a horizontal lower surface of the substrate), to enable mounting thereof. *See* Ex. 1005, FIGS. 5-10 (FIG. 5 reproduced below); Ex. 1006, ¶¶ [0043]-[0046]; Ex. 1003, ¶ 90.



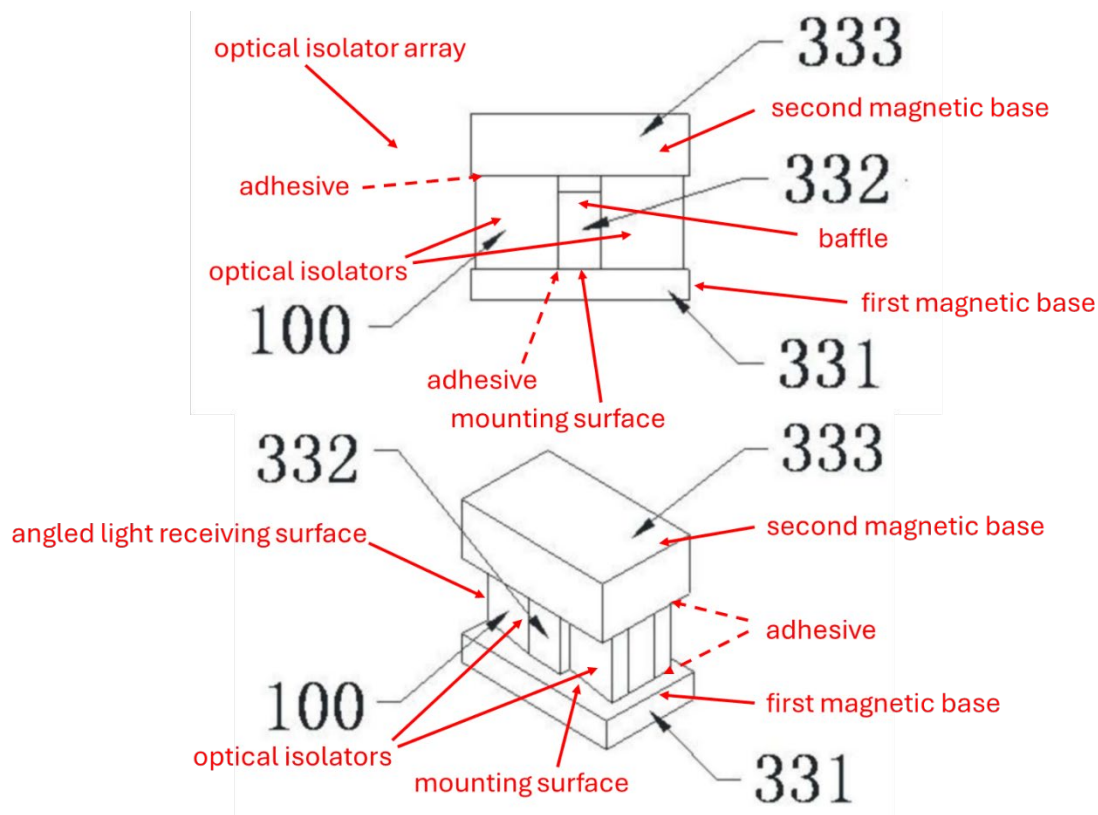
Ex. 1005, FIG. 5 (annotated)

Accordingly, as required by Claim 8, the magnetic base includes a substrate mating surface that is substantially flat to correspond with a mounting surface of the substrate. Ex. 1003, ¶ 91.

8. *Claim 9*

Wang, in FIGS. 11 and 12, discloses an embodiment that includes an optical isolator array having a magnetic base (base 311 or substrate 320) that defines at least

one mounting surface for the optical isolator array, and a second magnetic base coupled by adhesive to the top of the optical isolator array, to thereby generate an annular magnetic field around the isolators. Ex. 1006, FIGS. 11, 12 (reproduced below); Ex. 1006, ¶ [0048]; Ex. 1003, ¶ 92.



Ex. 1005, FIGS. 11 and 12 (annotated)

Accordingly, as required by Claim 9, Wang discloses that the optical isolator array may further include a second magnetic base coupled to the optical isolators via the layer(s) of adhesive. Ex. 1003, ¶ 92; *see* Ex. 1006, ¶ [0048] (“with reference to Figs. 11 and 12, the substrate further includes a top plate 313 disposed on the top of the isolators 100, and the top plate 313 is bonded to the isolators 100 by means of an

adhesive to achieve an annular seal of the isolators 100, so as to obtain an annular magnetic field or an annular space.”).

9. *Claim 10*

As discussed *supra* with respect to Claim 9, Wang discloses the second magnetic base coupled by adhesive to the isolators that generates a second magnetic field. Ex. 1005, FIGS. 11, 12; Ex. 1006, ¶ [0048]; Ex. 1003, ¶ 92. A POSITA in January 2019 would have understood that generating an annular magnetic field around the isolators, as described by Wang, necessarily would cause the second magnetic field generated by the second (top) magnetic base to intersect with the optical isolators. Ex. 1003, ¶ 94. Accordingly, as required by Claim 10, Wang discloses that the second magnetic base introduces a second magnetic field that intersects the optical isolators. *Id.*, ¶ 95.

B. Ground 2: Claims 11–19 Are Unpatentable Under 35 U.S.C. § 103 As Obvious Over Wang In View Of Xiong

1. *Motivation to Combine*

Wang and Xiong each is directed towards data communications in optical networks. Wang discloses an optical isolator array for use in a multichannel optical subassembly module. *See supra*, Section X.a.i. Xiong discloses integration of optical isolators into an optical subassembly module (e.g., a TOSA module of an optical transceiver). *See supra*, Section IX.b. For at least the reasons set forth below, a POSITA 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. Ex. 1003, ¶ 96.

First, a POSITA 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. Ex. 1003, ¶ 97. For example, Wang specifically describes these goals for its disclosed optical isolator array. Ex. 1006, ¶¶ [0008]-[0011], [0021]. Xiong also is directed to “an *integrated* and *compact* multifunctional optical isolator . . . , which is *suitable for use in a TOSA*.” Ex. 1008, 3:29-32 (emphasis added). Xiong further explains that the structures disclosed therein beneficially “have the potential to be used as key building blocks in TOSA” due to their having “a *relatively compact size*, lower cost, and *simplified assembly process*.” *Id.* at 14:61–63 (emphasis added). Accordingly, a POSITA would have understood that optical transceivers having TOSAs routinely employ optical isolators, and that Wang provides an alternative solution to the optimize use of space and simplify assembly and adjustment of components employed in optical subassembly modules and optical transceivers as indicated by Xiong. Ex. 1003, ¶ 97.

Second, a POSITA 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. Ex. 1003, ¶ 98. For example, Xiong discloses using a “magneto-optic device” to utilize the Faraday Effect and to thereby propagate light incident to an optical isolator of an optical subassembly module (e.g., a TOSA) in a predetermined direction. Ex. 1008, 13:20–53. Similarly, Wang discloses that the “working principal [behind the optical isolator] is that being based on Faraday rotation” and each isolator may employ a Faraday rotator. Ex. 1005, FIGS. 1, 6; Ex. 1006, ¶¶ [0019], [0038], [0042]. Thus, a POSITA would have understood that the multi-channel optical isolator array described in Wang could be beneficially employed in an optical subassembly module for an optical transceiver as described in Xiong to control the propagation of light in a preferred direction, while additionally optimizing the form factor and manufacturability of the associated optical subassembly module and transceiver. Ex. 1003, ¶ 98.

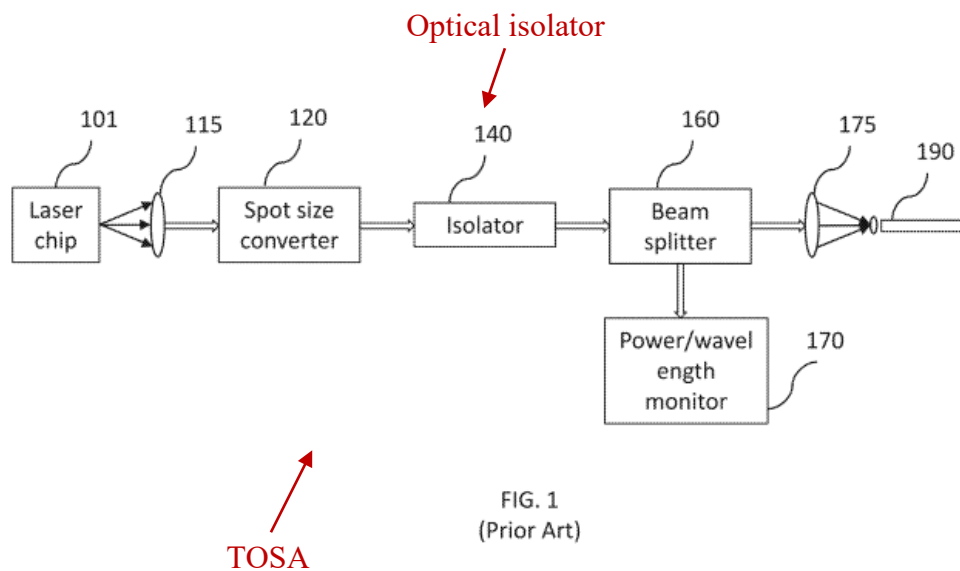
Finally, a POSITA would have understood that the optical isolator array of Wang could successfully be employed in a TOSA and optical transceiver, as exemplified by Xiong, because a POSITA would have understood that achieving the stated goals and benefits described in Wang, in TOSAs and optical transceivers, was the intended use of the device disclosed in Wang. *Id.*, ¶ 99.

2. Claim 11

[11a] Xiong discloses an optical transceiver having a TOSA. *See* Ex. 1008, 1:17-19; *see also* Ex. 1003, ¶ 100.

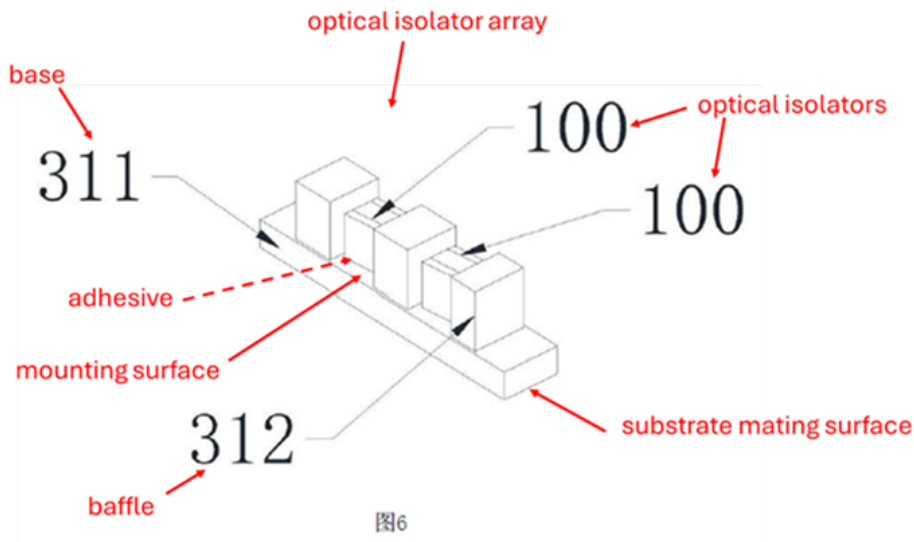
[11b] A POSITA would have understood, and it was well-known in January 2019, that the optical transceiver would include a transceiver housing to house various subassemblies and components of the optical transceiver. Ex. 1003, ¶ 101.

[11c] Xiong discloses the optical transceiver includes at least one TOSA arrangement. *See* Ex. 1008, FIG. 1, 1:19-21; *see also* Ex. 1003, ¶ 102. 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. Ex. 1003, ¶ 102.



Ex. 1008, FIG. 1

[11d] Wang discloses a substrate of an optical isolator array that is defined by at least one mounting surface. *See* Ex. 1005, FIGS. 5-10 (FIG. 6 reproduced below); Ex. 1006, ¶¶ [0037]-[0039]; *see also* Ex. 1003, ¶ 103. A POSITA would have understood, further in view of Xiong, that the optical isolator array and associated components are included in the TOSA arrangement. Ex. 1003, ¶ 103.



Ex. 1005, FIG. 6 (annotated)

[11e] 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. *See* Ex. 1008, FIG. 1, 1:24-65, 6:66-7:3; *see also* Ex. 1003, ¶ 104. A POSITA 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. Ex. 1003, ¶ 104.

[11f] 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. Ex. 1005, FIG. 1; Ex. 1006, ¶¶ [0037]-[0039]; Ex. 1003, ¶ 105. Wang discloses that its optical isolator array includes a base (substrate 311 or substrate 320) that defines at least one mounting surface for the optical isolator array, wherein all or part of the material of the base is a magnetic material. Ex. 1005, FIG. 6; Ex. 1006, ¶¶ [0012], [0040]; Ex. 1003, ¶ 105. Wang discloses that its plurality of optical isolators are mounted on the base in a substantially parallel arrangement relative to each other. Ex. 1005, FIGS. 6, 8; Ex. 1006 ¶¶ [0041], [0043]; Ex. 1003, ¶ 105.

Xiong discloses an optical isolator array 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. *See* Ex. 1008, 1:24-65, 6:66-7:3; Ex. 1003, ¶ 106. A POSITA would have understood that having the output of each laser diode of the plurality of laser diodes aligned with a respective isolator of the multi-channel optical isolator array of Wang, and that is exactly how the device of Wang was intended to be used. Ex. 1003, ¶ 106.

[11g] Xiong discloses the optical transceiver includes a ROSA. *See* Ex. 1008, 1:19-23; *see also* Ex. 1003, ¶ 107. A POSITA would have understood, and it was well-known in January 2019, that the ROSA would be located in the transceiver housing of the optical transceiver. Ex. 1003, ¶ 107.

For the foregoing reasons, Claim 11 is obvious over Wang in view of the knowledge of skill in the art of a POSITA as to how multi-channel optical isolators were used, as exemplified by Xiong. Ex. 1003, ¶ 108.

3. Claim 12

Claim 12 includes all of the limitations of Claims 11 in addition to those of Claim 2. Ex. 1003, ¶ 109. A POSITA would have understood that Wang, in view of the knowledge of skill in the art as to how multi-channel optical isolators were used as exemplified by Xiong, discloses all of the limitations of Claim 12 for the reasons set forth *supra* for Claims 11 and 2. *Id.*, ¶¶ 109-110.

4. Claim 13

Claim 12 includes all of the limitations of Claims 11 in addition to those of Claim 3. Ex. 1003, ¶ 111. A POSITA would have understood that Wang, in view of the knowledge of skill in the art as to how multi-channel optical isolators were used as exemplified by Xiong, discloses all of the limitations of Claim 13 for the reasons set forth *supra* for Claims 11 and 3. *Id.*, ¶¶ 111-112.

5. Claim 14

Claim 14 includes all of the limitations of Claims 11 in addition to those of Claim 5. Ex. 1003, ¶ 113. A POSITA would have understood that Wang, in view of the knowledge of skill in the art as to how multi-channel optical isolators were used as exemplified by Xiong, discloses all of the limitations of Claim 15 for the reasons set forth *supra* for Claims 11 and 5. *Id.*, ¶¶ 113-114.

6. Claim 15

Claim 15 includes all of the limitations of Claims 11 in addition to those of Claim 6. Ex. 1003, ¶ 115. A POSITA would have understood that Wang, in view of the knowledge of skill in the art as to how multi-channel optical isolators were used as exemplified by Xiong, discloses all of the limitations of Claim 15 for the reasons set forth *supra* for Claims 11 and 6. *Id.*, ¶¶ 115-116.

7. Claim 16

Claim 16 includes all of the limitations of Claims 11 in addition to those of Claim 7. Ex. 1003, ¶ 119. A POSITA would have understood that Wang, in view of the knowledge of skill in the art as to how multi-channel optical isolators were used as exemplified by Xiong, discloses all of the limitations of Claim 16 for the reasons set forth *supra* for Claims 11 and 7. *Id.*, ¶¶ 117-118.

8. Claim 17

Claim 17 includes all of the limitations of Claims 11 in addition to those of Claim 8. Ex. 1003, ¶ 119. A POSITA would have understood that Wang, in view of the knowledge of skill in the art as to how multi-channel optical isolators were used as exemplified by Xiong, discloses all of the limitations of Claim 17 for the reasons set forth *supra* for Claims 11 and 8. *Id.*, ¶¶ 119-120.

9. Claim 18

Claim 18 includes all of the limitations of Claims 11 in addition to those of Claim 9. Ex. 1003, ¶ 121. A POSITA would have understood that Wang, in view of the knowledge of skill in the art as to how multi-channel optical isolators were used as exemplified by Xiong, discloses all of the limitations of Claim 18 for the reasons set forth *supra* for Claims 11 and 9. *Id.*, ¶¶ 121-122.

10. Claim 19

Claim 19 includes all of the limitations of Claims 11 in addition to those of Claim 10. Ex. 1003, ¶ 123. A POSITA would have understood that Wang, in view of the knowledge of skill in the art as to how multi-channel optical isolators were used as exemplified by Xiong, discloses all of the limitations of Claim 19 for the reasons set forth *supra* for Claims 11 and 10. *Id.*, ¶¶ 123-124.

VIII. DISCRETIONARY ISSUES

A. The Petition Does Not Present the Same References Addressed in Prosecution

The Board should not deny institution under 35 U.S.C. § 325(d). As held in *Advanced Bionics*, “under § 325(d), the Board uses the following two-part framework [in determining whether to exercise its discretion in instituting *inter partes* review]: (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.” *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, No. IPR2019-01469, Paper 6 (P.T.A.B. Feb. 13, 2020), at 7–8 (precedential).

The Board has held that the first prong of *Advanced Bionics* is not met where “neither [the prior art on which the petition for *inter partes* review relies] nor similar prior art was before the examiner and, as such, the prosecution history does not include any overlapping arguments directed to this prior art.” *Godbersen-Smith Constr. Co. v. Guntert & Zimmerman Const. Div., Inc.* No. IPR2021-00050, Paper 24 (P.T.A.B. May 7, 2021), at 19–21. Further, in such cases, the Board “need not address part two of the analysis.” *Id.* at 21.

As discussed in Section V, *supra*, this Petition does not principally rely on any prior art references that were cited during the prosecution of the '690 Patent, nor is any of the prior art included in this Petition cumulative of the art considered by the Examiner therein. Ex. 1003, ¶¶ 59, 64. In contrast to the primary references cited by the Examiner during prosecution—namely, U.S. Patent App. Pub. No. US 2010/0002988 (“Yoshie”) and U.S. Patent App. Pub. No. 2014/0146389 (“Ye”)—the prior art references cited in this Petition are not directed a single optical isolators. Ex. 1003, ¶ 54. Instead, the principal prior art reference relied on in this Petition, Wang, Exs. 1105, 1006, discloses an optical isolator *array* for use in a multi-wavelength optical subassembly module (e.g., a TOSA module of an optical transceiver). *Id.* As such, the prior art references cited herein provide the same benefits of space-saving, ease of assembly, and alignment, alleged for invention of the '690 Patent. *Id.* at ¶ 60.

During prosecution of the '635 Application, the Examiner did not cite to any prior art reference that disclosed an optical isolator array. Ex. 1002. Remarkably, despite owning many prior patents relating to optical transceivers that include TOSA and ROSA modules (see., e.g., IPR2025-00433-IPR2025-436), Patent Owner did *not* submit an Information Disclosure Statement identifying any of those patents during pendency of the application for the '690 Patent. *Id.* Instead, only the two references made of record during prosecution of the '690 Patent were cited by the

Patent Examiner. Ex. 1001, cover.

Thus, the references cited in this Petition cannot be cumulative of the art and/or arguments raised during prosecution because there are material differences between the grounds presented herein and those previously presented. *See, e.g., Tianma Microelectronics Co., v. Japan Display Inc.*, No. IPR2021-01058, Paper 16, at 31 (P.T.A.B. Jan. 5, 2022). Since the first *Advanced Bionics* prong is not met here, the Board need not consider the second prong of the two-part framework. *Id.*; *Oticon Med. AB; William Demand Holding A/S v. Cochlear Ltd.*, No. IPR2019-00975, Paper 15, at 20 (P.T.A.B. Oct. 16, 2019).

B. The Board Should Not Deny Institution Under *Fintiv*

The claims of the '690 Patent have never been tested against the most relevant prior art available. In view of the strong challenges to the validity of the '690 Patent's claims presented herein and the nascent nature of the pending district court proceeding, institution should not be discretionarily denied under 35 U.S.C. § 314(a). *See Apple Inc. v. Fintiv, Inc.*, No. IPR2020-00019, Paper 11, at 5–16 (P.T.A.B. Mar. 20, 2020) (precedential) (enumerating factors favoring institution of *inter partes* review); *contra NHK Spring Co., Ltd. v. Intri-Plex Techs., Inc.*, No. IPR2018-00752, Paper 8, at 19–20 (P.T.A.B. Sept. 12, 2018) (precedential) (denying institution based, in part, on pending district court proceeding nearing final stages).

Under *Fintiv*, six factors are balanced in determining whether to discretionarily deny institution of *inter partes* review due to an earlier trial date:

[1] whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted; [2] proximity of the court's trial date to the Board's projected statutory deadline for a final written decision; [3] investment in the parallel proceeding by the court and the parties; [4] overlap between issues raised in the petition and in the parallel proceeding; [5] whether the petitioner and the defendant in the parallel proceeding are the same party; and [6] other circumstances that impact the Board's exercise of discretion, including the merits. *Apple Inc. v. Fintiv, Inc.*, No. IPR2020-00019, Paper 11, at 5–6 (P.T.A.B. Mar. 20, 2020) (precedential).

Applying the *Fintiv* factors to the present Petition favors institution of *inter partes* review:

The **first factor** (potential stay of the pending district court proceeding) is neutral because no party has requested a stay. *VMWare, Inc. v. Intellectual Ventures I LLC*, No. IPR2020-00470, Paper 13 (P.T.A.B. Aug. 18, 2020), at 17 (finding, in the absence of a stay motion, that the first factor “does not weigh for or against discretionary denial”).

The **second factor** (proximity of the district court trial date to the Board's statutory deadline) weighs against discretionary denial of institution. The trial date for the currently pending district court case is far in the future, with a jury trial

scheduled to begin on June 8, 2026. *See* Ex. 1011, p. 2. Because much can change in 18 months, the current trial date does not support denial of institution. *See Dish Network L.L.C. v. Broadband iTV, Inc.*, No. IPR2020-01280, Paper 17, at 16 (P.T.A.B. Feb. 4, 2021) (“We cannot ignore the fact that the currently scheduled trial date is more than nine months away and much can change during this time.”).

The **third factor** (investment in the district court proceeding by the court and the parties) weighs heavily against discretionary denial. The associated district court case remains in the very early stages of litigation: discovery remains in preliminary stages, with Defendant only recently serving its amended invalidity contentions, and a claim construction hearing is not scheduled until April 10, 2025. *See* Ex. 1011, p. 2. Moreover, it is unlikely that a claim construction order will issue prior to the PTAB’s projected institution decision date. Accordingly, the district court will not have invested significant resources or issued any substantive orders regarding the challenged ’690 Patent prior to the issuance of an institution decision. *See Fintiv*, No. IPR2020-00019, Paper 11, at 9–12. Further, Petitioner has diligently prepared and filed this Petition in advance of the statutory deadline to do so, which weighs against denying institution.

The **fourth factor** (overlapping issues between Petition and district court proceeding) favors institution. Instituting trial will allow issues to be narrowed in the district court case because, if trial is instituted by the Board, Petitioner stipulates

that it will not pursue invalidity against the asserted claims in the district court using the specific combination of prior art references set forth in the grounds presented in this Petition for purposes of establishing anticipation or obviousness. *See Sand Revolution II, LLC v. Continental Intermodal Group-Trucking LLC*, No. IPR2019-01393, Paper 24, at 11–12 (PTAB June 16, 2020) (holding a similar stipulation weighs against discretionary denial because such stipulation “mitigates . . . the concerns of duplicative efforts between the district court and the Board, as well as concerns of potentially conflicting decisions”). Given the lack of overlapping issues between this Petition and the pending district court proceeding, the fourth factor weighs against the Board exercising its discretion to deny institution.

The **fifth factor** (overlapping parties) is neutral, as it is “far from an unusual circumstance that a petitioner in *inter partes* review and a defendant in a parallel district court proceeding are the same.” *Sand Revolution II*, No. IPR2019-01393, Paper 24, at 12–13.

The **sixth factor** (other considerations) weighs against discretionary denial. As discussed herein, the merits of the Petition are strong, and the Challenged Claims are invalid. For example, none of the grounds asserted herein were previously considered by either the Office or the district court. *See Comcast Cable Commn’s, LLC v. Rovi Guides, Inc.*, No. IPR2019-00231, Paper 14, at 11 (P.T.A.B. May 20, 2019) (holding that challenges not “previously considered by the Office or by any

court . . . weigh in favor of not denying institution based on § 314(a)’’). Moreover, the ’690 Patent is currently asserted in two pending district court cases. Institution of this *inter partes* review would provide the opportunity for narrowing and simplifying the litigation for the district court.

Accordingly, the Board should decline to exercise its discretion under *Fintiv* and institute trial.

IX. CONCLUSION

Petitioner respectfully requests cancellation of the Challenged Claims.

X. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8

A. Real Party-in-Interest (37 C.F.R. § 42.8(b)(1))

The real parties-in-interest are Cambridge Industries USA, Inc, which is a named defendant in the associated district court proceeding, and its parent corporation, CIG Shanghai, Co. Ltd.

B. Related Matter(s) (37 C.F.R. § 42.8(b)(2))

Pursuant to 37 C.F.R. § 42.8(b)(2), Petitioner is aware of the following pending lawsuit(s) or related matter(s) involving the ’690 Patent:

- *Applied Optoelectronics, Inc. v. Cambridge Industries USA, Inc.*, No. 3:24-cv-01010 (N.D. Cal.) (filed Feb. 20, 2024)
- *Applied Optoelectronics, Inc. v. Accelight Technologies, Inc.*, No. 3:24-cv-09041 (N.D. Cal. 2024) (filed Dec. 13, 2024)

C. Designation of Counsel (37 C.F.R. § 42.8(b)(3))

Petitioner provides the following designation of counsel:

Lead Counsel	Backup Counsel
Nicola A. Pisano Reg. No. 34,408 Phone: (858) 252-2952 Fax: (858) 252-6503 Email: nicolapisano@eversheds-sutherland.com Eversheds Sutherland (US) LLP 12255 El Camino Real, Suite 100 San Diego, CA 92130-2071	Regis C. Worley, Jr. Reg. No. 58,430 Phone: (858) 252-6458 Fax: (858) 252-6503 Email: regisworley@eversheds-sutherland.com Eversheds Sutherland (US) LLP 12255 El Camino Real, Suite 100 San Diego, CA 92130-2071

Pursuant to 37 C.F.R. § 42.8(b)(4), counsel agrees to service by mail as detailed above, and to electronic service by email at the following addresses: nicolapisano@eversheds-sutherland.com; and regisworley@eversheds-sutherland.com. Pursuant to 37 C.F.R § 42.10(b), a Power of Attorney executed by Petitioner accompanies this Petition.

D. Service Information (37 C.F.R. § 42.8(b)(4))

Please address all correspondence and service to the addresses listed above.

Petitioner consents to electronic service directed to: nicolapisano@eversheds-sutherland.com; and regisworley@eversheds-sutherland.com.

Date: January 17, 2025

By: /Nicola A. Pisano/

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CLAIMS APPENDIX

Claim	Recitation
[1a]	An optical isolator array for use in an optical subassembly module, the optical isolator array comprising:
[1b]	a first magnetic base defining at least one mounting surface;
[1c]	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
[1d]	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.
2	The optical isolator array of claim 1, wherein the magnetic base is formed from a permanent magnet.
3	The optical isolator array of claim 1, wherein the magnetic base introduces a first magnetic field that intersects with the plurality of optical isolators to establish a direction of propagation.
4	The optical isolator array of claim 1, wherein each optical isolator of the plurality of optical isolators comprises a Faraday Isolator.
5	The optical isolator array of claim 1, wherein each optical isolator of the plurality of optical isolators includes an angled light-receiving surface to receive channel wavelengths from an associated laser diode.
6	The optical isolator array of claim 1, wherein the plurality of optical isolators is disposed uniformly across the at least one mounting surface.
7	The optical isolator array of claim 1, wherein the at least one layer of adhesive is disposed between adjacent optical isolators of the plurality of optical isolators.
8	The optical isolator array of claim 1, wherein the magnetic base includes a substrate mating surface, and whereby the substrate mating surface is substantially flat to correspond with a mounting surface of a substrate and to mount thereto.

Claim	Recitation
9	The optical isolator array of claim 1, further comprising a second magnetic base, the second magnetic base being coupled to the plurality of optical isolators via the at least one layer of adhesive.
10	The optical isolator array of claim 9, wherein the second magnetic base introduces a second magnetic field, the second magnetic field intersecting with the plurality of optical isolators.
[11a]	An optical transceiver, the optical transceiver comprising:
[11b]	a transceiver housing;
[11c]	at least one optical transmitter subassembly (TOSA) arrangement disposed in the transceiver housing, the at least one TOSA arrangement comprising:
[11d]	a substrate defined by at least one mounting surface;
[11e]	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
[11f]	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;
[11g]	an optical receiver subassembly (ROSA) disposed in the transceiver housing.
12	The optical transceiver of claim 11, wherein the first magnetic base of the optical isolator array is formed from a permanent magnet.
13	The optical transceiver of claim 11, wherein the first magnetic base introduces a first magnetic field that intersects with the plurality of optical isolators to establish a direction of propagation.

Claim	Recitation
14	The optical transceiver of claim 11, wherein each optical isolator of the plurality of optical isolators includes an angled light-receiving surface to receive channel wavelengths from a corresponding laser diode of the plurality of laser diodes.
15	The optical transceiver of claim 11, wherein the plurality of optical isolators is disposed uniformly across the at least one mounting surface.
16	The optical transceiver of claim 11, wherein at least one layer of adhesive is disposed between adjacent optical isolators of the plurality of optical isolators.
17	The optical transceiver of claim 11, wherein the first magnetic base includes a substrate mating surface, and whereby the substrate mating surface is substantially flat to correspond with the mounting surface of a substrate to mount thereto.
18	The optical transceiver of claim 11, further comprising a second magnetic base, the second magnetic base being coupled to the plurality of optical isolators and the first magnetic base via at least one layer of adhesive.
19	The optical transceiver of claim 18, wherein the second magnetic base introduces a second magnetic field, the second magnetic field intersecting with the plurality of optical isolators.

CERTIFICATION UNDER 37 C.F.R. § 42.24

Petitioner certifies that the word count in this Petition is 7569 words, as counted by the word-processing program (Microsoft Word for Office 365) used to generate this Petition, such word count excluding the table of contents, table of authorities, mandatory notices under 37 C.F.R. § 42.8, certificate of service, appendix of exhibits or claim listing, and this certificate of word count. This Petition is in compliance with the 14,000-word limit set in 37 C.F.R. §42.24(a)(1)(i).

Date: January 17, 2025

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6(e), 42.105, the undersigned hereby certifies that true and correct copies of the above-captioned PETITION FOR INTER PARTES REVIEW OF U.S. PATENT NO. 10,788,690, all associated exhibits, and Petitioner's Power of Attorney were served in their entirety on January 17, 2025, upon Patent Owner at the correspondence address of record for the subject patent as listed on the USPTO's Patent Center via Priority Mail Express®:

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