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 IPR2025-00434
Patent No. 10,379,301

PATENT OWNER'S REQUEST TO DIRECTOR FOR DISCRETIONARY DENIAL OF PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT 10,379,301

(Pursuant to Director's Memorandum of March 26, 2025)

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TABLE OF AUTHORITIES

EXHIBITS

Exhibit No.	Description
2001	Acting Director Stewart's March 26, 2025 Memorandum entitled "Interim Processes for PTAB Workload Management"
2002	CIG USA's Invalidity Contentions in *Applied Optoelectronics, Inc. v. Cambridge Industries USA, Inc.*, case no. 3-24-cv-01010-JD (N.D. CA)
2003	Scheduling Order in *Applied Optoelectronics, Inc. v. Accelight Technologies, Inc.*, case no. 4:24-cv-09041-HSG (N.D. CA)

I. INTRODUCTION

This request is submitted by Patent Owner Applied Optoelectronics, Inc. ("AOI") to the Director of the United States Patent and Trademark Office ("USPTO") pursuant to the Director's Memorandum "Interim Processes for PTAB Workload Management" dated March 26, 2025 (the "March 26, 2025 Memorandum", Exhibit 2001). This is AOI's separate brief, pursuant to the March 26, 2025 Memorandum, requesting a discretionary denial of the Petition of Cambridge Industries USA, Inc. ("Petitioner" or "CIG USA") for *inter partes* review ("IPR") of U.S. Patent No. 10,379,301 entitled "Multi-Channel Parallel Optical Receiving Device" ("the '301 Patent") (the "Petition"). This brief is timely as it is submitted within two months of the February 28, 2025 date on which the PTAB entered its Notice of Filing Date Accorded to Petition.[1] *See* Paper 3.

Pursuant to the March 26, 2025 Memorandum and the relevant factors, the Director should exercise their discretion and deny institution of IPR of the '301 Patent.

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[1] AOI will separately file its Patent Owner's Preliminary Response by the due date of May 28, 2025.

II. FACTUAL BACKGROUND

A. The ’301 Patent

The application for the ’301 Patent was filed on February 14, 2017 as application no. 145/432,242 with seven claims, including one independent claim. *See* “File History”, Exhibit 1002.

On August 29, 2017, in a non-final Office Action, the Office rejected claims 1-4 and 6 as anticipated by U.S. Patent Application Publication No. 2017/0168252 to Pezeshki et al and as obvious over U.S. Patent Application Publication No. 2016/0349451 to Shen, et al (“Shen”) in view of Pezeshki. The Office also rejected claims 5 and 7 as obvious over Pezeshki in view of another reference. In connection with the Office Action, the Examiner submitted a “Notice Of References Cited,” which listed U.S. Patent Application Publication No. 2016/0149662 to Soldano (the “Soldano Patent Application Publication”).

On February 28, 2018, AOI filed an amendment, amending claim 1 to include the subject matter of claim 4, cancelling claim 4, and adding new independent claim 8 which included the subject matter of claims 1 and 5.

On March 1, 2018, AOI filed a filed an Information Disclosure Statement, citing the Soldano Patent Application Publication, among others.

On April 13, 2018, the Office mailed a final Office Action, rejecting all of the claims as either anticipated or obvious over various combinations of six different references, including Shen. The obviousness rejections relied on Shen in three different combinations with three other references. This was the second Office Action that relied on Shen. In the Office Action, the Examiner stated that all references in the Information Disclosure Statement "have been considered and made of record." File History, Exhibit 1002, p. 169. The Office Action included AOI's Information Disclosure Statement filed on March 1, 2018 which cited the Soldano Patent Application Publication, with the Examiner's notation "All references considered except where lined through" and no references were lined through. *Id*. at p. 195.

On August 13, 2018, AOI filed an amendment and RCE.

On September 13, 2018, The Office mailed a non-final Office Action repeating several of the prior obviousness rejections and asserting new obviousness rejections based on various combinations of the six previously cited references, including Shen. The obviousness rejections (four of which were directed to independent claims 1 or 8) relied on Shen in six different combinations with four other references. This was the third Office Action that relied on Shen.

On December 12, 2018, AOI conducted a conducted an interview with the Office, and, on December 13, 2018, filed a reply.

The Office mailed a non-final Office Action on January 28, 2019 in which all of the claims were rejected under as indefinite or lacking antecedent basis under 35 U.S.C. § 112(b), but withdrawing the obviousness rejections.

On April 29, 2019, AOI filed an amendment, amending independent claims 1 and 8 and several dependent claims to address the § 112 rejections.

On May 13, 2019, the Office mailed a Notice of Allowance, which included a Notice of Allowability stating that "the closest prior art of record does not expressly teach or reasonably suggest, in combination, each claim limitation as embodied by amended independent claims 1 and/or 8." (File History, Exhibit 1002, pp. 36-37.) The Notice of Allowability further stated that "the Examiner is unable to make a prima facie case for obviousness …." *Id*.

The '301 Patent issued on August 13, 2019 with seven claims, including two independent claims.

B. <u>The Litigation Between AOI and Petitioner</u>

On February 20, 2024, AOI filed a lawsuit against Petitioner for patent infringement entitled *Applied Optoelectronics, Inc. v. Cambridge Industries, Inc.*, case no. 3:24-cv-01010-JD (N.D. CA) (the "Litigation"). The complaint alleges that Petitioner infringes eight of AOI's patents, including the '301 Patent. AOI filed a First Amended Complaint on April 25, 2024.

On May 16, 2024, the parties exchanged initial disclosures. On June 6, 2024, AOI served its infringement contentions, stating that Petitioner infringes claims 1-4 and 7 of the ’301 patent. On October 15, 2024, Petitioner served its amended invalidity contentions. Exhibit 2002. Petitioner’s contentions state that claims 1-4 and 7 are invalid under either § 102 or § 103 based on five grounds based on five different references, the following grounds of which are relevant here: (1) anticipated by or obvious over U.S. Patent Application Publication No. 2016/0349451 to Shen, et al.; and (2) anticipated by or obvious over U.S. Patent No. 9,768,901 to Soldano (“Soldano”)[2].

On August 8, 2024, the District Court entered its scheduling order setting the following pre-trial dates: a claim construction hearing on April 10, 2025, fact discovery cut-off on September 29, 2025, expert discovery cut-off on December 29, 2025, dispositive motion cut-off on January 28, 2026, and pre-trial conference on May 21, 2026. The court set a jury trial for June 8, 2026. *See* Exhibit 1010

[2] U.S. Patent No. 9,768,901 to Soldano is the patent that issued from U.S. Patent Application Publication No. 2016/0149662. The publication is referred to herein as the “Soldano Patent Application Publication,” while the issued patent is referred to as “Soldano.”

(Scheduling Order).

On November 7, 2024, Petitioner filed its answer and counterclaims against AOI. In its counterclaims, Petitioner alleges that each of the eight patents-in-suit is invalid. On November 15, 2024, AOI filed its answer to the counterclaims.

Pursuant to the District Court's Scheduling Order, between October 2024 and March 2025, AOI and Petitioner exchanged proposed terms for claim construction, exchanged preliminary claim constructions and extrinsic evidence, filed a joint claim construction statement and pre-hearing statement, exchanged damage contentions, and filed opening, responsive, and reply claim construction briefs. *See id.*

On March 19, 2025, AOI and Petitioner jointly filed a Notice to Court of Filing of Petitions for *Inter Partes* Review, informing the District Court that Petitioner had filed petitions for IPR of five of the eight patents-in-suit. On April 4, 2025, the District Court issued an order staying the case pending further order, vacating the claim construction hearing set for April 10, 2025, and requiring the parties to file joint status reports on the status of the PTAB proceedings every 90 days beginning on July 7, 2025.

C. The Additional Litigation Involving the '301 Patent

In addition to the Litigation against Petitioner, AOI has filed another patent infringement suit against another defendant, Accelight Technologies, Inc. ("Accelight"), entitled *Applied Optoelectronics, Inc. v. Accelight Technologies, Inc.*, case no. 4:24-cv-09041-HSG (N.D. CA) (the "Additional Litigation"). The complaint, filed on December 13, 2024, alleges infringement of six AOI patents, including the '301 Patent. Four of the other patents-in-suit are also the subject of the Litigation and are the subject of separate petitions for IPR that Petitioner filed on January 17, 2025, the same day that Petitioner filed the Petition that is the subject of this request.[3] Thus, the Litigation with Petitioner and Additional Litigation share five patents-in-suit, all of which are the subject of separate petitions for IPR that Petitioner filed in January 2025.

On March 28, 2025, AOI and defendant Accelight jointly filed a Notice to Court of Filing of Petitions for *Inter Partes* Review, informing the District Court that Petitioner had filed petitions for IPR of five of the six patents-in-suit. In the Joint Case Management Statement, defendant Accelight stated that one of the issues in the case was whether the asserted claims of the patents-in-suit were invalid. At

[3] AOI is filing Requests to the Director for Discretionary Denial of Petitioner's other four Petitions for IPR on grounds similar to this Request on the same day as this Request is filed.

the case management conference held on April 22, 2025, the court indicated that the case would move forward, and stated that it would set claim construction deadlines.

On April 23, 2025, the court entered a Scheduling Order which set the following dates: invalidity contentions and documents on May 30, 2025; exchange of proposed terms for claim construction on June 13, 2025; exchange of preliminary constructions and extrinsic evidence on July 7, 2025; damages contentions on July 22, 2025; a Joint Claim Construction Statement and Prehearing Statement to be filed on July 30, 2025; claim construction discovery cut-off on August 29, 2025; opening, responsive, and reply claim construction briefs to be filed on September 16, 2025, September 30, 2025, and October 7, 2025, respectively; a technical tutorial on October 17, 2025; and a claim construction hearing on October 31, 2025. *See* Exhibit 2003.

D. **The Petition for *Inter Partes* Review**

On January 17, 2025, 11 months after AOI filed its complaint in the Litigation and seven months after AOI served its infringement contentions in the Litigation, Petitioner filed its Petition for IPR of the ’301 Patent, PTAB Case IPR2025-434. On the same date, Petitioner also filed petitions for IPR of four of the other AOI patents-in-suit: U.S. Patent Nos. 9,523,826; 10,313,024; 10,788,690; and 10,042,116.

In the Petition for IPR of the ’301 patent, Petitioner challenges claims 1-7.

Petitioner asserts two grounds of invalidity: (1) anticipated by U.S. Patent Application Publication No. 2016/0349451 to Shen, et al. (and including and the Shen provisional application no. 62/166015)[4]; and (2) anticipated by U.S. Patent No. 9,768,901 to Soldano.

The Petition relies on the 53-page declaration of Petitioner's expert, Dr. Andrew G. Kirk. *See* Exhibit 1003. Petitioner's other four petitions for IPR of the other four patents also rely on a declaration of Dr. Kirk.

On February 28, 2025, the PTAB issued its Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response (Paper 3).

Pursuant to the Notice of Filing Date, Patent Owner's Preliminary Response is due three months from the Notice date, by May 28, 2025. Pursuant to the PTAB's "Consolidated Trial Practice Guide – November 2019," the PTAB will determine whether to institute an IPR within three months of the date the Patent Owner's Preliminary Response was filed or was due, by about August 28, 2025. Pursuant to 35 U.S.C. § 316(a)(11), the PTAB will set the trial date for the IPR within one year

[4] U.S. Patent Application Publication No. 2016/0349451 to Shen, et al. is referred to herein as "Shen", while the Shen provisional application no. 62/166015 is referred to as the "Shen provisional application."

of the notice of institution, no later than about August 28, 2026.

III. INSTITUTION OF *INTER PARTES* REVIEW SHOULD BE DENIED PURSUANT TO THE DIRECTOR'S DISCRETION.

The Director should exercise their discretion pursuant to the Memorandum of March 26, 2025 and deny institution of IPR on the '301 Patent. The following factors support a discretionary denial:

- Art relied upon in the Petition was also relied upon by the PTO (the "Office") in rejecting claims during prosecution.
- There is significant overlap between the issues in the Petition and in the Litigation. Many of the same claims are challenged, and some of the grounds, the key art, and the arguments are substantially the same in the Petition as in the Litigation. All of the art relied upon in the Petition is also relied upon by Petitioner in the Litigation.
- There has been significant investment in the Litigation in that substantive issues have already been addressed by the parties.
- There are settled expectations in the enforcement of the '301 Patent in that the patent has been in force for almost six years.
- Petitioner's arguments on unpatentability are weak.
- The Petition relies heavily on the declaration of an expert.

- Petitioner and the defendant are the same party.
- The ’301 Patent is one of the patents-in-suit in the Additional Litigation between AOI and defendant Accelight, and claim construction and the validity of the ’301 Patent may well be adjudicated before the PTAB’s decision in an IPR would be due.
- There are no relevant changes in the law that affect patentability.
- Four of the other five patents asserted by AOI in the Litigation are each the subject of an IPR filed by Petitioner on the same date as this Petition.

Each of these factors is discussed separately below in sections A through J.

A. <u>**The Petition is Based in part on Art Relied Upon by the Office in Rejecting Claims.**</u>

The Director may consider whether the same or substantially the same prior art or arguments were previously before the Office during prosecution. 35 U.S.C. § 325(d); *Advanced Bionics, LLC v. Med-El Elektromedizinische Gerate GMBH,* IPR2019-01469, Paper 6, pp.7-8 (Feb. 13, 2020) (precedential); *General Plastic Industrial Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19, p. 17 (Sept. 6, 2017) (precedential).

Pursuant to § 325(d), the Board uses a two-part test for this factor: (1) whether the same or substantially the same art or arguments were previously presented to the Office; and, if the first part is met, (2) whether the petitioner has shown that the Office erred in a material way with respect to patentability. *Advanced Bionics, supra,* at p. 8. If the first part is met, and the petitioner does not demonstrate material error by the Office, "the Director generally will exercise discretion not to institute IPR." *Id*. at p. 9.

> "If reasonable minds can disagree regarding the purported treatment of the art or arguments, it cannot be said that the Office erred in a manner material to patentability. At bottom, this framework reflects a commitment to defer to previous Office evaluations of the evidence of record unless material error is shown."

Id.

The Board may use the *Becton, Dickinson* factors (*Becton, Dickinson and Company v. B. Braun Melsungen AG,* IPR2017-01586, Paper 8, pp. 17-18 (December 15, 2017) (precedential section)) to apply the two-part *Advanced Bionics* test. *Advanced Bionics, supra,* at p. 9. These factors are non-exclusive and are to be "read broadly" (*id*. at p. 10): (a) the similarities and differences between the asserted art and the prior art involved during examination; (b) the cumulative nature of the asserted art and the prior art evaluated during examination; (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection; (d) the extent of the overlap between the arguments made during examination and the manner in which the petitioner relies on the prior art; (e) whether the petitioner has pointed out sufficiently how the examiner erred in their evaluation of the asserted prior art; and (f) the extent to which additional evidence and facts presented in the petition justifies reconsideration of the prior art or arguments. According to *Advanced Bionics*, factors (a), (b), and (d) are used to determine if the same or substantially the same art or arguments were previously presented to the Office. Factors (c), (e), and (f) are then applied to determine if the petitioner has shown that the Office made a material error. *Id*.

Here, Petitioner makes two arguments for invalidity of claims 1-7: (1) anticipated by U.S. Patent Application Publication No. 2016/0349451 to Shen, et al. and the Shen provisional application no. 62/166015; and (2) anticipated by U.S. Patent No. 9,768,901 to Soldano.

With respect to Petitioner's argument as to Shen, the first part of the *Advanced Bionics* test is met because the same art and similar argument was previously presented to the Office. During prosecution, Shen was a key reference. Shen was relied upon by the Office in rejecting claims as obvious in three separate Office Actions (on August 29, 2017, April 13, 2018, and September 13, 2018). In these three Office Actions, Shen was relied upon in rejecting claims in at least six different combinations with up to four other references. Shen was the primary refence in many of the rejections. Thus, Shen was not only clearly considered, but relied upon repeatedly and in a variety of combinations with several other references by the Office in rejection the claims. Petitioner relies on the Shen provisional application which Petitioner states was not cited or considered by the Office. However, the subject matter of Shen and the Shen provisional application are similar and Shen was the subject of extensive evaluation by the Office.

The second part of the *Advanced Bionics* test as to Shen is also met. Factor (c) is present because the Office evaluated Shen in that it relied on Shen consistently and multiple times in multiple ways to reject claims. Factor (e) is not present or satisfied by Petitioner because Petitioner has not shown that the Office made a material error in evaluating Shen. Petitioner relies on its expert, who states: "in my opinion, a POSITA would have understood the Shen provisional application as explaining that it was simply a matter of design choice whether to locate the light receiving chip on the carrier rather than a PCB." Exhibit 1003, Declaration of Andrew G. Kirk in Support of Petition, p. 34, para. 82 (emphasis added). However, Petitioner has failed to show how the Office erred in not finding the claims anticipated as Petitioner's expert opines. Given that Petitioner's argument is based on an opinion about a design choice, then "reasonable minds can disagree regarding the purported treatment of the art ….. [and] it cannot be said that the Office erred in a manner material to patentability." *See Advanced Bionics*, *supra*, at p. 9. Factor (f) is not present or satisfied by Petitioner because Petitioner offers no other evidence to justify reconsideration of the prior art or arguments.

With respect to Petitioner's argument as to Soldano, the first part of the *Advanced Bionics* test is met because the same art was previously presented to the Office. The Soldano Patent Application Publication (which is essentially the same as Soldano) was cited by the Office, listed in an Information Disclosure Statement, and considered by the Office, although not relied upon by the Office in rejecting claims.

The second part of the *Advanced Bionics* test as to Soldano is also met. Factor (c) is present because the Office evaluated the Soldano Patent Application Publication. Factor (e) is not present or satisfied by Petitioner because Petitioner has not shown that the Office made a material error in its consideration of Soldano. Factor (f) is not present or satisfied by Petitioner because Petitioner offers no other evidence to justify reconsideration of the prior art or arguments.

Therefore, pursuant to *Advanced Bionics*, the Director should exercise their discretion and deny institution of IPR based on this factor.

B. The Issues in the Petition Have Significant Overlap with the Issues in the Litigation.

The Director may consider whether there is significant overlap between the issues raised in the Petition and in the Litigation. *See Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11, p. 6 (March 20, 2020) (precedential) ("[I]f the petition includes the same or substantially the same claims, grounds, arguments, and evidence as presented in the parallel proceeding, this fact has favored denial.").

Here, there is significant overlap in the issues raised in the Petition and in the Litigation.

First, many of the same claims are challenged in the Petition (claims 1-7) as are challenged in the Litigation (claims 1-4, 7).

Second, all of the art relied upon in the Petition (Shen and Soldano) is relied upon in the Litigation. The art at issue in the Petition is a subset of the art at issue in the Litigation.

Third, the two grounds for invalidity in the Petition are the same or substantially the same as two of the several grounds asserted in the Litigation. In the Petition, Petitioner argues that claims 1-7 are anticipated by Shen; in the Litigation, Petitioner argues that claims 1-4 and 7 are anticipated by or obvious over by Shen. In the Petition, Petitioner argues that claims 1-7 are anticipated by Soldano; in the Litigation, Petitioner argues that claims 1-4 and 7 are anticipated by or obvious over Soldano.

Fourth, the arguments in the Petition are substantially the same as the arguments in the Litigation. Petitioner's arguments as to where the claim limitations are found in the prior art, on a limitation-by-limitation basis, are essentially the same in both proceedings. This is demonstrated by a comparison of the Declaration of Andrew G. Kirk in Support of Petition (Exhibit 1003 at pp. 32-43 as to Shen and pp. 44-52 as to Soldano) filed in the PTAB with Petitioner's Amended Invalidity Contentions and claim charts filed in the Litigation (Exhibit 2002, Ex. G-1 as to Shen and Ex. G-5 as to Soldano).

Thus, there is significant overlap in the challenged claims, the grounds, the art, and the arguments. Moreover, the Litigation involves three other references and three additional grounds not asserted in the Petition. And the Litigation also involves seven other patents. Thus, the issues in the Petition are essentially a subset of the issues in the Litigation; meaning that the Litigation will need to go forward regardless of whether IPR is instituted. The fact that the Litigation involves additional challenges to the '301 Patent weighs in favor of a denial. *See Next Caller Inc. v. Trustid, Inc.*, IPR 2019-00963, Paper 8, p. 12 (October 28, 2019) (informative).

Accordingly, this factor favors denial of institution.

C. **<u>The Parties Have Invested in the Litigation by Addressing Substantive Issues.</u>**

Pursuant to the District Court's Scheduling Order, between October 2024 and March 2025, AOI and Petitioner exchanged proposed terms for claim construction, exchanged preliminary claim constructions and extrinsic evidence, filed a joint claim construction statement and pre-hearing statement, exchanged damage contentions, and filed opening, responsive, and reply claim construction briefs.

Thus, the parties have spent significant time and effort in conducting discovery, in the claim construction process, and in briefing claim construction.

This factor weighs in favor of denial of institution.

D. **<u>There are Settled Expectations in the '301 Patent</u>**.

The '301 Patent was issued on August 13, 2019. The patent has been in force for almost six years. Thus, there are settled expectations of the parties that the '301 Patent is valid and enforceable.

This factor weighs in favor of denial of institution. *See* March 26, 2025 Memorandum, Exhibit 2001, p. 2.

E. **<u>Petitioner's Arguments on Unpatentability are Weak</u>**.

The Director may consider the strength of the petitioner's unpatentability challenge in determining whether to discretionarily deny institution of IPR. March

26, 2025 Memorandum, Exhibit 2001, p. 2; *Apple Inc. v. Fintiv, Inc.*, *supra,* pp. 14-15. If the merits are a "close call," that fact weighs in favor of denying institution if other factors favoring denial are present. *Id*. at p. 15.

Here, Petitioner alleges anticipation based on Shen (Ground 1) and anticipation based on Soldano (Ground 2). However, Petitioner is unlikely to succeed on the merits under either Ground 1 or Ground 2 because neither reference discloses all the limitations of any claim of the '301 Patent.[5]

1. Overview of the '301 Patent

The '301 Patent provides a multi-channel parallel optical receiving device, including a carrier, a light receiving chip, a plurality of optoelectronic diodes disposed on a top surface of an end of the carrier, an optical fiber connector disposed in another end of the carrier, and an arrayed waveguide grating disposed on the top surface of the carrier. *See* '301 Patent (Exhibit 1001), Abstract.

Figure 1 (reproduced below) shows an example of the multi-channel parallel optical receiving device disclosed in the '301 Patent which includes a carrier 8 and

[5] For purposes of this Request to the Director for Discretionary Denial, AOI will only discuss a few specific examples of limitations the cited refences fail to disclose.

a light receiving chip 2. A plurality of optoelectronic diodes 3 are disposed on a top surface of an end of the carrier 8, and the plurality of optoelectronic diodes 3 are electrically connected to the light receiving chip 2. The light receiving chip 2 may be a trans-impedance amplifier (TIA) chip, and the optoelectronic diodes 3 and the trans-impedance amplifier (TIA) chip are connected by bonding wires. An optical fiber connector 4 may be disposed at another end of the carrier 8, and an arrayed waveguide grating 6 may be further disposed on the top surface of the carrier 8. *Id.* at Col. 2:66-3:13.

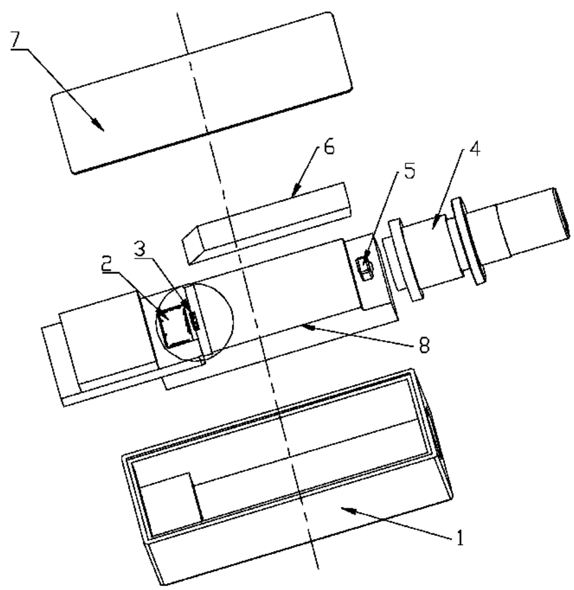


FIG. 1

Figure 3 (reproduced below) then shows an input end 61 of the arrayed waveguide grating 6 may be connected to the optical fiber connector 4 for receiving an optical signal from the optical fiber. The optical signals may be divided into multi-channel optical signals in parallel by the arrayed waveguide grating 6 based on their wavelengths. The top surface 63 of an output end 62 of the arrayed waveguide grating 6 may be designed to be at a predetermined angle, allowing for the multi-channel optical signals to be reflected by the top surface 63 to the photosensitive surfaces of the plurality of optoelectronic diodes 3 arranged in array. *Id.* at 3:13-3:22.

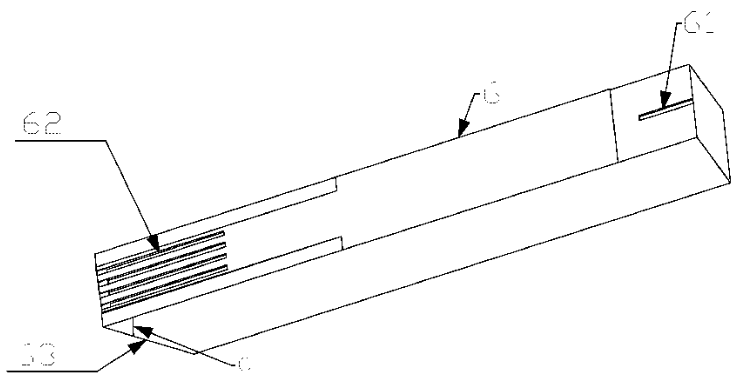


FIG. 3

Figure 4 (reproduced below) shows an embodiment of the ’301 Patent in which first lens 5, for coupling the optical fiber, may be disposed between the input end 61 of the arrayed waveguide grating 6 and the optical fiber connector 4. In this embodiment, the first lens 5 disposed on the carrier 8 may be located on the optical path of the optical fiber connector 4 and the arrayed waveguide grating 6, for the optical coupling to be realized. *Id.* at Col. 4:21-28.

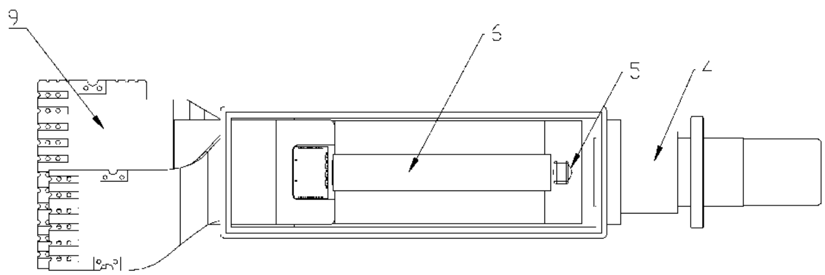


FIG. 4

2. Ground 1: Shen Does Not Anticipate the ’301 Patent Because It Fails to Disclose All the Limitations of Any Claim.

Shen fails to disclose all the limitations of any claim of the ’301 Patent. For example, Shen does not disclose “a plurality of optoelectronic diodes disposed on the top surface of the end of the carrier, and the plurality of optoelectronic diodes electrically connected to the light receiving chip via bonding wire, wherein the optoelectronic diodes and the light receiving chip are disposed directly on the same top surface of the end of the carrier;” as required by claims 1-7.

Specifically, Shen fails to disclose “a plurality of optoelectronic diodes disposed on the top surface of the end of the carrier, and the plurality of optoelectronic diodes electrically connected to the light receiving chip via bonding wire, wherein the optoelectronic diodes and the light receiving chip are disposed directly on the same top surface of the end of the carrier" as required by independent claim 1. Claims 2-6 depend from claim 1 and thus also contain this limitation. Similarly, independent claim 7 also requires this limitation. And, thus, Shen fails to disclose all limitations of any claim of the '301 Patent.

a. Overview of Shen

Shen (Exhibits 1007 (U.S. Patent App. Pub. No. US 2016/0349451) and 1008 (U.S. Provisional Patent App. 62/166,015)) is directed to an optical connection module that includes a substrate, an arrayed wavelength grating structure, an optical detector, and an oblique surface. The arrayed wavelength grating structure is disposed on the substrate and the arrayed wavelength grating structure is configured to transmit a light. The optical detector is disposed on the substrate, and the optical detector is configured to detect the light propagating through the arrayed wavelength grating structure. The oblique surface is configured to redirect the light from the arrayed wavelength grating structure to the optical detector. Exhibit 1007, Abstract.

Figure 1 of Shen shows a cross-section view of an optical connection module 10 in accordance with Shen:

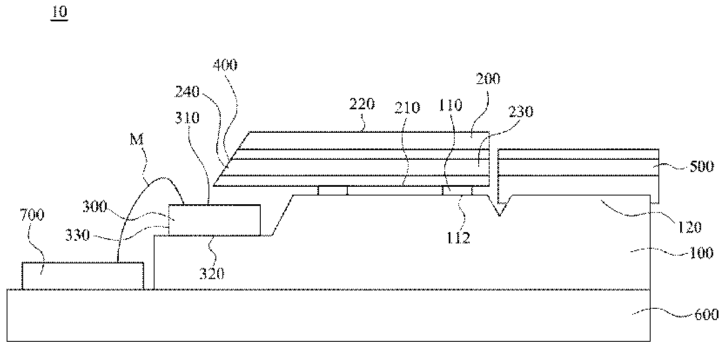


Fig. 1

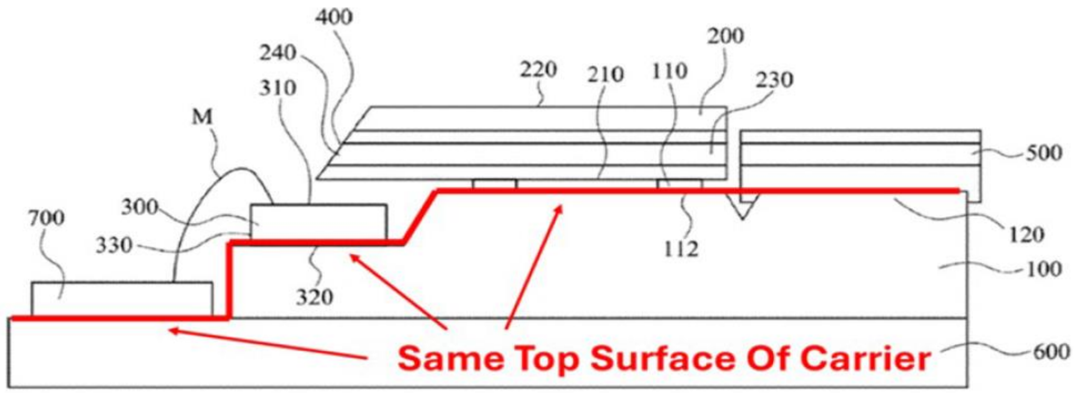
As shown in Figure 1, an optical connection module 10 may include a substrate 100, an arrayed wavelength grating (AWG) structure 200 disposed on the substrate 100, an optical detector 300 disposed on the substrate 100, and an oblique surface 400. *Id.* at ¶33. According to Shen, the optical connection module 10 may further include a circuit board 600 and a driver 700, and the substrate 100 is disposed on the circuit board 600. The driver 700 is disposed on the circuit board 600, and the driver 700 is configured to drive the optical detector 300 or provide the optical detector 300 with an electric signal. The driver 700 and the optical detector 300 may be connected electrically by the wire M. *Id.* at ¶44.

b. Shen fails to disclose "a plurality of optoelectronic diodes disposed on the top surface of the end of the carrier, and the plurality of optoelectronic diodes electrically connected to the light receiving chip via bonding wire, wherein the optoelectronic diodes and the light receiving chip are disposed directly on the same top surface of the end of the carrier;" as required by claims 1-7 of the '301 Patent.

Shen fails to disclose "a plurality of optoelectronic diodes disposed on the top surface of the end of the carrier, and the plurality of optoelectronic diodes electrically connected to the light receiving chip via bonding wire, wherein the optoelectronic diodes and the light receiving chip are disposed directly on the same top surface of the end of the carrier" as required by independent claim 1. Claims 2-6 depend from claim 1 and thus also contain this limitation. Similarly, independent claim 7 also requires this limitation. And, thus, Shen fails to disclose all limitations of any claim of the '301 Patent.

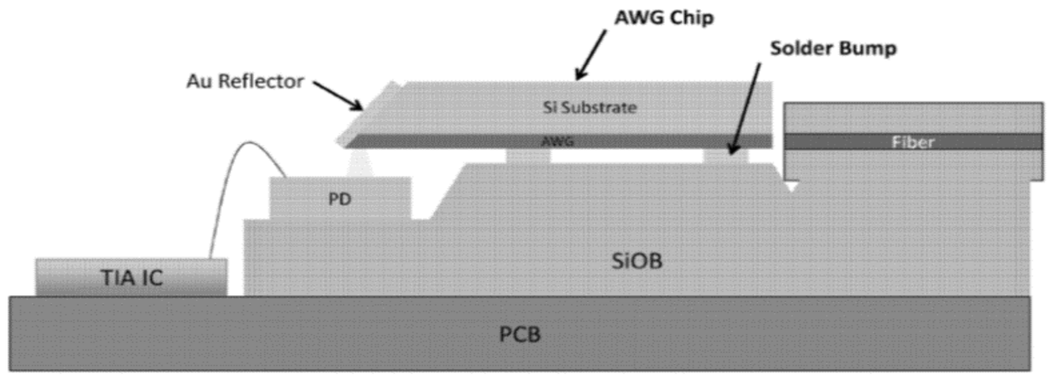
Petitioner and its expert argues Shen discloses that "[t]he optical detector (e.g., photodiodes) (300) and the light receiving chip (700) are located directly on the same top surface of the end of the carrier.". Petition at p. 18; Exh. 1003 at ¶84.

However, Shen does not teach that the "optical detector (e.g., photodiodes) (300) and the light receiving chip (700)" "are disposed directly on the same top surface of the end of the carrier." This is shown in an annotated version of Figure 1 of Shen as follows:



Indeed, as explained by Shen, "the optical connection module 10 may further include a circuit board 600 and a driver 700, and the substrate 100 is disposed on the circuit board 600. The driver 700 is disposed on the circuit board 600, and the driver 700 is configured to drive the optical detector 300 or provide the optical detector 300 with an electric signal." Exhibit 1007 at ¶44.

Thus, in addition to failing to show "optical detector (e.g., photodiodes) (300) and the light receiving chip (700)" "are disposed directly on the same top surface of the end of the carrier," Petitioner also improperly combines substrate (100) and PCB (600) of Shen as a carrier. Indeed, Petitioner argues Shen discloses "that the photodiodes and TIA IC (corresponding to the claimed "light receiving circuit") could both be located on the SIOB substrate (which is a carrier, not a PCB) to minimize wire bonds." See Petition at p. 17. Petitioner then reproduces the flowing figure from the Shen Provisional (Exhibit 1008):



However, if the substrate 100 (i.e. SiOB in the figure above) is the carrier, then the light receiving chip (700) (TIA IC in the figure above) is not on a carrier. But, if the PCB (600) in the figure above is the carrier, then optical detector (300) (PD in the figure above) is not on a carrier.

Regardless, even if Petitioner can combine the PCB and substrate (SiOB) as a carrier, which it cannot, optical detector (300) and the light receiving chip (700) are not on the same surface as shown in the annotated Figure 1 from Shen (Exhibit 1007) above. Further, in this case, light receiving chip (700) is also not at the end of the carrier as required.

Thus, Shen does not disclose "wherein the optoelectronic diodes and the light receiving chip are disposed directly on the same top surface of the end of the carrier" as required by claim 1-7.

3. Ground 2: Soldano Does Not Anticipate the '301 Patent Because It Fails to Disclose All the Limitations of Any Claim.

Soldano (Exhibit 1009) fails to disclose all the limitations of any claim of the ’301 Patent. For example, Soldano does not disclose “a light receiving chip disposed on a top surface of an end of the carrier”, “wherein the optoelectronic diodes and the light receiving chip are disposed directly on the same top surface of the end of the carrier”, and “an arrayed waveguide grating further disposed on a top surface of the carrier that defines a midpoint of the carrier” as required by claim 1. Claims 2-6 depend from claim 1 and thus also contain this limitation. Similarly, independent claim 7 also requires this limitation. And, thus, Soldano fails to disclose all limitations of any claim of the ’301 Patent.

a. Overview of Soldano

Soldano (Exhibit 1009) is directed to an assembly of waveguide wavelength multiplexers and demultiplexers, together with continuous wave (CW) laser transmitters that interface to grating couplers on a silicon photonics chip, providing CW sources, multiplexed output and optionally multiplexed input, all using a single photonic lightwave circuit (PLC). Exhibit 1009, Abstract.

In short, Soldano provides a method of coupling light in and out of silicon photonics chips using a PLC as an intermediate material. *Id.* at 2:64-66. As explained, “by fabricating waveguide multiplexers and demultiplexers in glass PLCs, multi-wavelength fibers are broken down to individual wavelengths before entering or exiting the silicon and so each grating coupler in the silicon can be used only at a single wavelength, compensating for the limited optical bandwidth of the silicon grating coupler." *Id.* at 2:66-3:5.

FIG. 3 of Soldano shows the overall structure in accordance with aspects of the invention as follows:

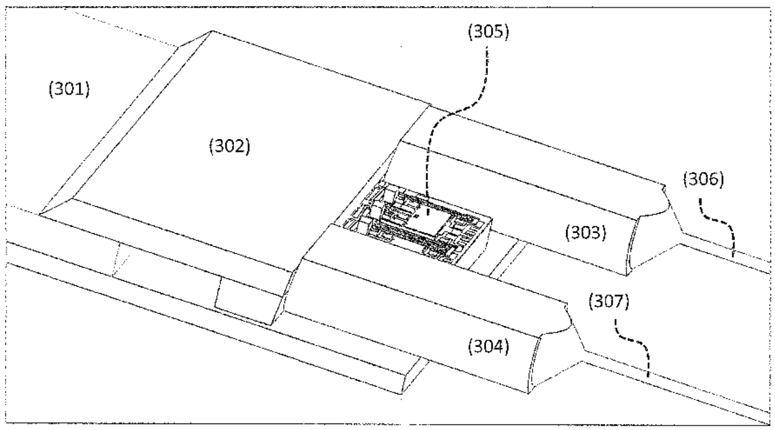


Fig 3

As explained in Soldano, multi-wavelength light enters through fiber 306. This fiber is glued into a capillary 303 that is aligned to the PLC 302. This light is then demultiplexed into four individual channels in the PLC 302. The other end of the PLC includes a structure for directing, or deflecting, this light down into the silicon photonics chip 301. A MEMS coupling structure 305 couples light from lasers into the PLC. *Id.* at 7:62-8:31.

FIG. 5 of Soldano shows a detail of the side polish of the PLC and the grating coupler:

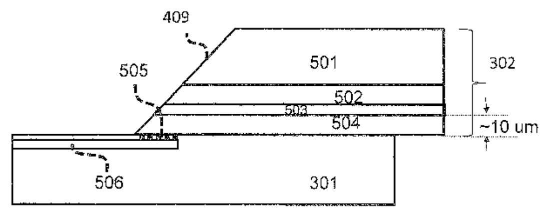


Fig 5

As explained in Soldano, the PLC wafer 302 includes a silicon substrate 501 on which various layers of glass are formed. The wafer is polished at an angle and then attached upside down to the silicon photonics chip 301. The PLC waveguides have two outer cladding regions 502 and 504, and a higher index core region 503. When the wafer is placed on the silicon photonics chip 301, the angle polish 409 causes the beam to reflect against the polished surface, diffract through the roughly 10 um of top cladding 504 and imping on the grating coupler 505. *Id.* at 9:52-63.

b. <u>Soldano Fails to Disclose "a light receiving chip disposed on a top surface of an end of the carrier"</u>

Soldano fails to disclose "a light receiving chip disposed on a top surface of an end of the carrier" as required by independent claim 1. Claims 2-6 depend from claim 1 and thus also contain this limitation. Similarly, independent claim 7 also requires this limitation. And, thus, Soldano fails to disclose all limitations of any claim of the ’301 Patent.

The ’301 Patent discloses “[t]he light receiving chip 2 of this embodiment may be a trans-impedance amplifier (TIA) chip.” ’301 Patent at Col. 3:5-6. However, Soldano discloses “[c] urrently integrated detectors in silicon do not have the performance of separately fabricated InP detectors. So one may desire to implement only the modulators on the silicon chip and have a more conventional detector path. In this case waveguides 607 would terminate on a standard InP photodetector array and either use a separate TIA or be electrically connected to the 620, the TIAs in the silicon chip.”

Therefore, Soldano does not disclose “a light receiving chip disposed on a top surface of an end of the carrier”.

c. <u>Soldano Fails to Disclose “wherein the optoelectronic diodes and the light receiving chip are disposed directly on the same top surface of the end of the carrier”</u>

Soldano fails to disclose “wherein the optoelectronic diodes and the light receiving chip are disposed directly on the same top surface of the end of the carrier” as required by independent claim 1. Claims 2-6 depend from claim 1 and thus also contain this limitation. Similarly, independent claim 7 also requires this limitation. And, thus, Soldano fails to disclose all limitations of any claim of the

'301 Patent.

Petitioner points to Figures 3 and 5 in Soldano as allegedly disclosing this limitation and argues the grating couplers 505 are the plurality of optoelectronic diodes. *See* Petition as p. 25. However, Figures 3 and 5 of Soldano depict the grating couplers 505, which can be placed in lieu of photodetectors (*see, e.g.*, Col. 10:15), are located underneath the top surface of the silicon photonics chip 301. And, Petitioner specifically argues "[t]he silicon photonics chip [301] of Soldano corresponds to the claimed 'carrier' of the '301 patent." Petition at p. 25.

This is shown in Petitioner's annotated version of Figure 5 as follows:

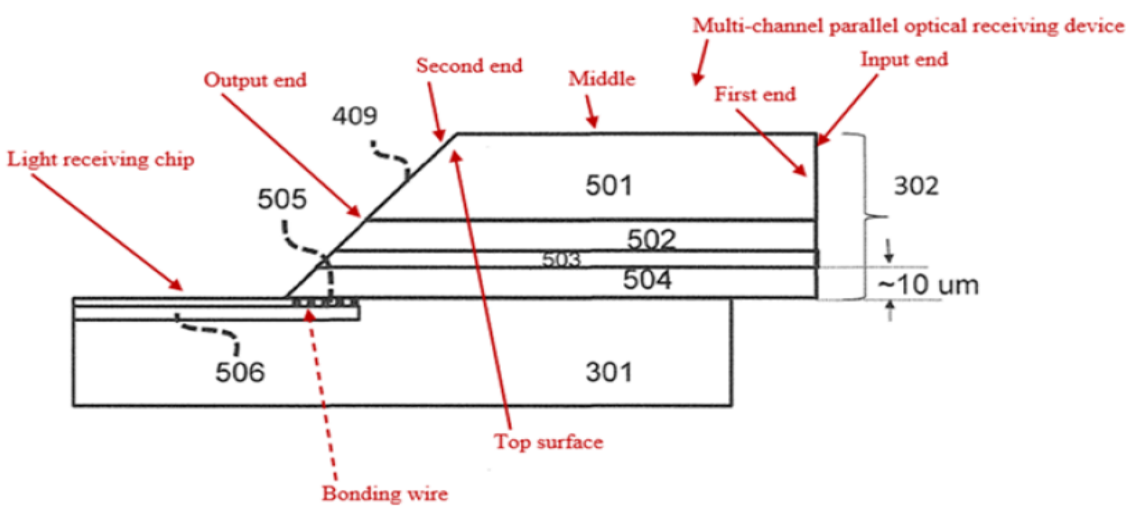
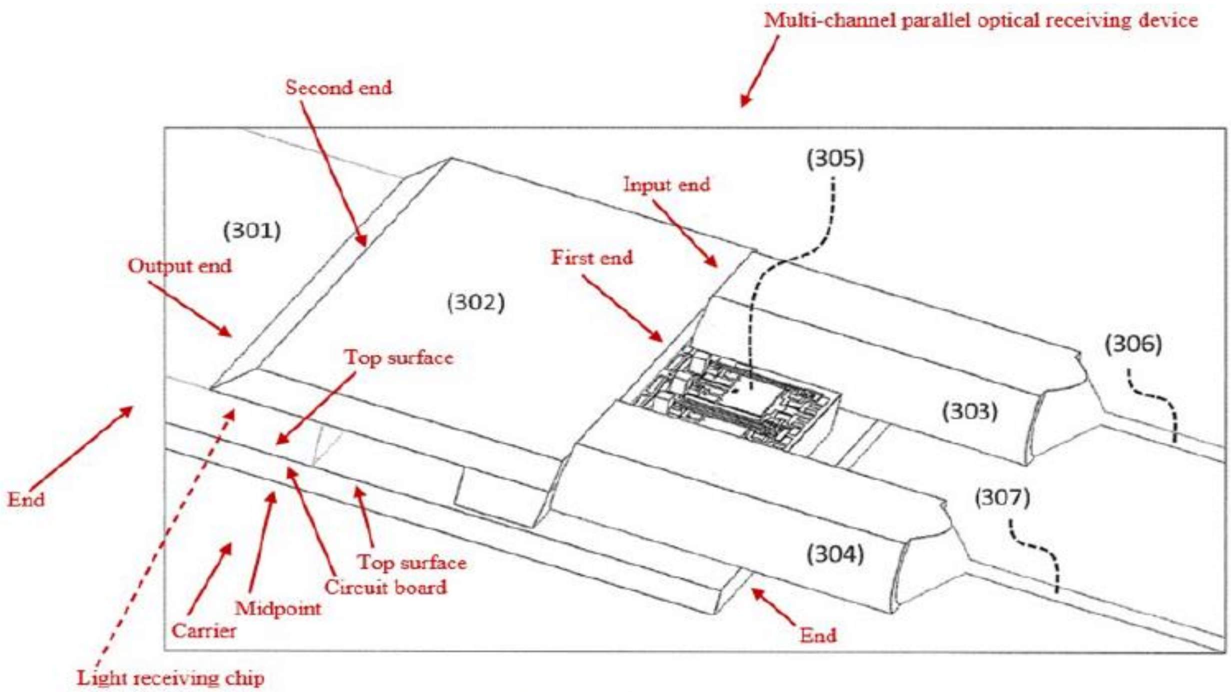


FIG. 1009, FIG. 5

Further, Petitioner's annotated version of Figure 3 (and Figure 5 above) shows the grating couplers 505 (below the "Output end") are not at the "end" of the alleged substrate (silicon photonics chip 301) as identified by Petitioner as follows:



Ex. 1009, FIG. 3

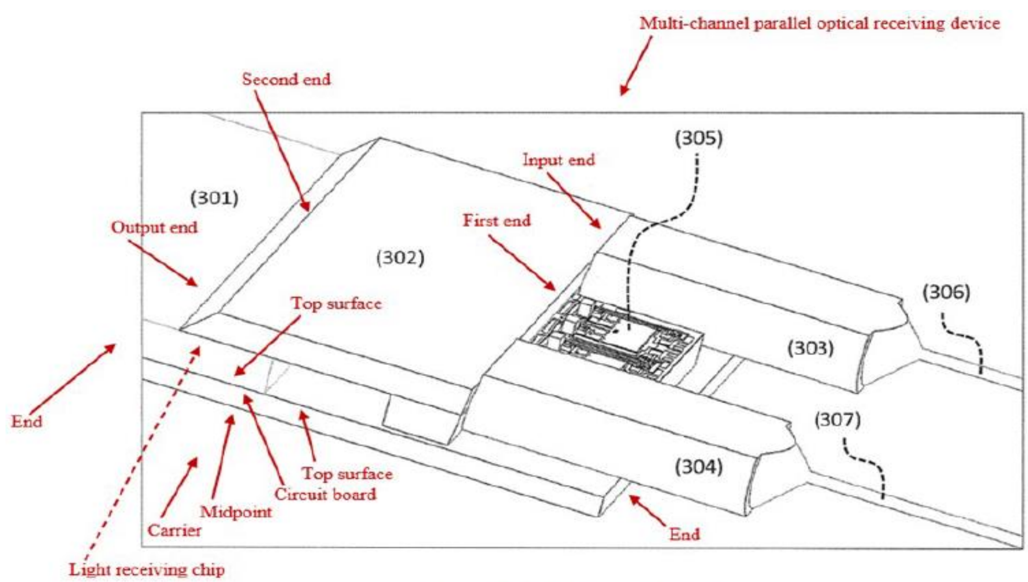
Indeed, the grating couplers 505 (below the "Output end") are near what Petitioner has identified as the "midpoint" as shown in Petitioner's annotated Figure 3 reproduced above.

Therefore, Soldano does not disclose "a light receiving chip disposed on a top surface of an end of the carrier".

d. <u>Soldano Fails to Disclose "an arrayed waveguide grating further disposed on a top surface of the carrier that defines a midpoint of the carrier".</u>

Soldano fails to disclose "an arrayed waveguide grating further disposed on a top surface of the carrier that defines a midpoint of the carrier" as required by independent claim 1. Claims 2-6 depend from claim 1 and thus also contain this limitation. Similarly, independent claim 7 also requires this limitation. And, thus, Soldano fails to disclose all limitations of any claim of the '301 Patent.

Petitioner argues "Soldano discloses an arrayed waveguide grating (302) located on a top surface of the carrier that defines a midpoint of the carrier." But, as shown again in Petitioner's annotated version of Figure 3, arrayed waveguide grating (302) is not at the midpoint of the carrier - wherein Petitioner specifically argues "[t]he silicon photonics chip [301] of Soldano corresponds to the claimed 'carrier' of the '301 patent." Petition at p. 25.



Ex. 1009, FIG. 3

Therefore, Soldano does not disclose "an arrayed waveguide grating further disposed on a top surface of the carrier that defines a midpoint of the carrier".

F. **The Petition Relies Almost Exclusively on the Declaration of an Expert.**

An over-reliance on expert testimony may weigh in favor of discretionary denial of an IPR. *See Next Caller Inc., supra,* p. 14 (informative); *see also* March 26, 2025 Memorandum, Exhibit 2001, p. 2. The Petition is based almost exclusively on the Declaration of Andrew Kirk, Petitioner's expert (Exhibit 1003). As can be seen from the Petition, every limitation of every challenged claim cites to Exhibit 1003 (*see,* Petition, pp. 16-23 for Shen and pp. 44-52 for Soldano), and the Declaration of Dr. Kirk discusses every limitation of every claim (*see,* Exhibit 1003, pp. 32-43 for Shen and pp. 44-52 for Soldano).

Accordingly, this factor weighs in favor of denial.

G. **Petitioner and the Defendant Are the Same Party.**

Here, the fact that Petitioner and the Defendant in the Litigation are the same party weighs in favor of denial of institution. *See Apple Inc. v. Fintiv, Inc., supra,* pp. 13-14.

H. **The Validity of the '301 Patent May Be Adjudicated by a District Court Before the PTAB's Decision Is Due if IPR is Instituted.**

The Director may consider whether another forum has already adjudicated the validity of the challenged claims in determining whether to discretionarily deny institution of IPR. *See* March 26, 2025 Memorandum, Exhibit 2001, p. 2.

Here, the ’301 Patent is one of the patents-in-suit in the Additional Litigation between AOI and defendant Accelight, filed on December 13, 2024. As noted above, five of the six patents-in-suit in the Additional Litigation are also in suit in the Litigation with Petitioner and are the subject of petitions for IPR filed by Petitioner. In the Additional Litigation, the District Court has ordered the case to move forward, despite the parties’ notifying the court that five of the six patents-in-suit are the subject of petitions for IPR filed by Petitioner. On April 23, 2025, the court entered a Scheduling Order which set all of the dates pertaining to claim construction between June 2025 and October 2025 (exchange of proposed terms, exchange of preliminary constructions and extrinsic evidence, damages contentions, a Joint Claim Construction Statement and Prehearing Statement, claim construction discovery cut-off, opening, responsive, and reply claim construction briefs, and a technical tutorial), and set a claim construction hearing on October 31, 2025. *See* Exhibit 2003.

Defendant Accelight has stated that the validity of the asserted claims of the patents-in-suit is in issue and that it will be taking discovery on invalidity. The court has set invalidity contentions and documents due on May 30, 2025.

Thus, the validity of the ’301 Patent may well be adjudicated in the

Additional Litigation before the PTAB's decision in an IPR, which would be due on or about August 28, 2026 if IPR is instituted. Accordingly, this factor weighs in favor of denial.

I. <u>There Are No Relevant Changes in the Law that Affect Patentability.</u>

There have been no changes in the law or judicial precedent regarding patentability since the '301 Patent issued. Accordingly, this factor weighs in favor of denial of institution. *See* March 26, 2025 Memorandum, Exhibit 2001, p. 2.

J. <u>Petitioner Filed Petitions for IPR for Four of the Other Patents Asserted by AOI in the Litigation on the Same Date as this Petition.</u>

The Director may consider all relevant circumstances in determining whether to discretionarily deny institution of IPR. March 26, 2025 Memorandum, Exhibit 2001, p. 3; *Apple Inc. v. Fintiv, Inc., supra*, p. 14. The Litigation involves eight AOI patents, five of which are the subject of petitions for IPR filed by Petitioner, including the '301 Patent. These facts indicate that Litigation will need to go forward regardless of the petitions for IPR. Therefore, it would be more efficient for the validity of the '301 Patent to be resolved in the Litigation, and the PTAB could conserve its resources by denying institution. *See Next Caller Inc., supra*, p. 14, fn. 13, with similar facts (informative). Therefore, this factor weighs in favor of denial.

IV. CONCLUSION

For the reasons set forth above, the Director should exercise their discretion pursuant to the Memorandum of March 26, 2025 and deny institution of IPR on the ’301 Patent.

Dated: April 28, 2025

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CERTIFICATE UNDER 37 C.F.R. SECTION 42.24

AOI certifies that the word count in this Request, as determined by the Microsoft Word word-processing system is 7,207 words. This Request is in compliance with the 14,000-word limit pursuant to the Director's Memorandum of March 26, 2025 and 37 C.F.R. §42.24.

Dated: April 28, 2025

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CERTIFICATE OF SERVICE

The undersigned hereby certifies service on the Petitioner, pursuant to 37 C.F.R. §42.6(e) and by agreement of counsel, by electronic (e-mail) delivery of a true copy of the foregoing **PATENT OWNER'S REQUEST TO DIRECTOR FOR DISCRETIONARY DENIAL OF PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT 10,379,301 (Pursuant to Director's Memorandum of March 26, 2025)**, which was served on April 28, 2025 to the following Counsel for Petitioner via e-mail:

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