

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ACCELIGHT TECHNOLOGIES, INC.,
Petitioner,

v.

APPLIED OPTOELECTRONICS, INC.,
Patent Owner.

IPR2026-00093
U.S. Patent No. 9,523,826

**DECLARATION OF MICHAEL LEBBY, PH.D. IN SUPPORT OF *INTER*
PARTES REVIEW OF U.S. PATENT NO. 9,523,826**

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I, Michael Lebby, declare as follows:

I. INTRODUCTION

1. I have been retained as a technical expert in the field of optoelectronics by Perkins Coie LLP (“Perkins Coie”) on behalf of Accelight Technologies, Inc. (“ATI”). This Declaration is in support of *inter partes* review of claims 1-7 (“the Challenged Claims”) of U.S. Patent No. 9,523,826 (“the ’826 patent”).

2. I am being compensated for my work on this matter at my standard rate of \$550.00 per hour. My compensation in no way depends on the outcome of this proceeding, the content of my testimony, or any issues involved in or related to this proceeding. In preparing this Declaration, I reviewed and considered the ’826 patent, the prosecution history of the ’826 patent, and the prior art references that I discuss in this Declaration. In addition to these materials, I may consider additional documents and information in forming any supplemental opinions. To the extent I am provided additional documents or information, including any expert declarations filed by Patent Owner in this proceeding, I may offer further opinions.

3. Based on my experience, knowledge of the art at the relevant time, analysis of the prior art references, and the understanding a person of ordinary skill in the art would have of the claim terms in light of the specification, it is my opinion that the

Challenged Claims of the '826 patent are anticipated and are obvious based on the prior art references discussed below. This Declaration is based on information currently available to me. I reserve the right to supplement the opinions set forth in this Declaration in light of additional discovery or opinions offered by any expert on behalf of Patent Owner in this matter.

II. QUALIFICATION AND EXPERIENCE

A. My Qualifications

4. Stated briefly, I am an engineer with a Ph.D. in Electrical and Electronic Engineering and have worked extensively with electrical and electronic circuits, connectors, electronic and optoelectronic systems, as well as integrated circuit semiconductors for electronic and fiber optic solutions. Overall, I have approximately 40 years of experience working in industry to develop new electronic and optoelectronic based products that I have taken from research to manufacturing.

5. Exhibit A to this Declaration is my current curriculum vitae ("CV"), which provides details on my education, experience, publications, and other qualifications.

B. My Education

6. I received a Bachelor of Engineering degree in Electrical and Electronic Engineering in 1984 from the University of Bradford, UK. I also received a Ph.D. in Electrical and Electronic Engineering in 1987 from the University of Bradford, UK.

And I received a Doctor of Engineering degree in Electrical and Electronic Engineering in 2004 from the University of Bradford, UK.

C. My Professional Experience

7. I am currently Chief Executive Officer (CEO) and Chief Technology Officer (CTO) of GenusTechnik Inc., which is my consulting company, through which I engage in expert witness work.

8. I recently retired as Chairman and CEO of Lightwave Logic Inc. (NASDAQ: LWLG), where I served as a Director of the Board of Directors since 2015.

9. I am a named inventor on over 225 issued U.S. utility patents. My work has led to inventorship in subjects such as semiconductors, electronics, optics, connectors, high frequency electronic products, and optoelectronics. I am the author of more than 60 publications.

10. I am a Fellow grade of three professional organizations: IEEE (Institute of Electrical and Electronic Engineers), NAI (National Academy of Inventors), and Optica (Optical Society of America).

11. Exhibit A includes a summary of my employment history.

D. My Relevant Experience in the Field of Art

12. As described above, and further detailed in my CV (Exhibit A), over the course of my 40-year career in electronics and optoelectronics, I have worked in nearly every aspect of the electronic and optoelectronics business, ranging from

wafers to components, modules, connectors, and cable technology. At the wafer level, I have experience in epitaxial wafer growth (compound semiconductors), electrical and optoelectronic device and circuit design, using modeling and simulation, electrical and optoelectronic device and component fabrication, testing and qualification, the implementation of devices into packages, connectors, and panels, both hermetic and non-hermetic, as well as analysis of package/panel materials such as plastics (including plastic housings such as resin-packaged lead frame housings), optical plastics, metallic-based packages, semiconductor-based packages, and ceramic-based packages for the telecommunications and data-communications industries. I have also designed device packages (through-pin, surface mount, flip-chip, and various combinations thereof) for printed circuit board mounting as well as electrical and optical connectors for various industrial and environmental applications. Many of the designed packages and connectors were implemented into telecommunications and data-communications applications both as manufactured products as well as testing, characterization, and analysis of qualified product for volume scaling. The modules/panels have been designed to work at RF frequencies that include copper wire, twisted wire pair and fiber-optics. I have also worked in industrial research-and-development laboratories to take new high-performance RF-based electrical, electronic, optoelectronic- and photonic-

based technologies from the research proof-of-concept phase through prototyping and qualified manufacturing for volume release. This has included both transfer as well as injection molding techniques for packaging and cabling connector designs.

13. I have been both an entrepreneur (*e.g.*, Ignis Optics Inc, One Chip Photonics, Lightwave Logic Inc.), as well as an intrapreneur (*e.g.*, Motorola, Intel, TE Connectivity (previously Tyco Electronics), AT&T Bell Labs), creating innovative new cabling, connector, modules for telecommunications and data-communications programs, both at venture backed start-ups as well as corporate funded divisions. I have built these entities to develop electronic, optoelectronics, and photonics technology from the laboratory and fabrication clean room to production factories.

14. My career started in the late 1970s at the Ministry of Defense in UK, where I worked at their R&D facility in Malvern (RSRE – Royal Signals and Radar Establishment). I worked on electronic and optoelectronic semiconductor device design, as well as basic and high frequency telecommunications and data-communications electronics for modules, cable, connector, and circuit implementation. My research work on electronics then took me to AT&T Bell Laboratories in 1985, where I pursued research in novel electronic and optoelectronic semiconductor material systems that included FETs, bipolar transistors, optical waveguides, optics, LEDs, laser diodes, and photodetectors. This

research work became in part the subject of my Ph.D. thesis, which was granted in 1987.

15. I moved to Motorola in 1989 to further develop my electronic, optoelectronic, and semiconductor engineering skills, and I became a telecommunications and data-communications Research and Development Manager in Motorola, until I left the company in 1998. During my time at Motorola, I worked on many photonic, electronic, and optical technology projects that included electronic circuits (both analog and digital), electronic cable connectors, twisted wire pairs, electrical and optical interconnects, displays, LEDs, OLEDs, as well as the packaging and reliability of mobile product prototypes. At that time, I was particularly interested in miniaturization of electronics and optoelectronics, and worked on novel designs that included high frequency, high data rate electronics, cables, connectors, and optoelectronics, as well as advanced prototypes of futuristic communications hardware.¹

¹ Communication hardware refers to physical devices and systems used for transmitting data or information between two or more points typically via copper

16. During my time at Motorola as a Research and Development Manager, I designed optical and electrical packages/panels for displays and devices, which included standard TO-cans, over-molded plastic DIL solutions, jacks, plugs, optical waveguides, and ceramic-based and semiconductor-based technologies for the telecommunications and data-communications industries.

17. The research work at Motorola also included work on displays and in particular, miniature displays and optics for pagers, clam-shell phones, and head-mounted displays that included mounting onto eyeglasses (similar in concept to Google Glass™) as well as techniques for electrical and optical connections in these applications.

cable, fiber optics cable, optical wireless and RF wireless. Popular examples include modems, routers, switches, modules or transceivers, wireless access points, and various wireless technologies like electrical cables, fiber optic cables, Wi-Fi and Bluetooth. These devices enable data transmission and reception, facilitating communication across networks.

18. I also initiated Motorola's work in optical interconnect (Optobus™) technology, which incorporated both transfer and injection molded optical parts that included the design of multi-channel electrical and optical connector technology as well as multi-channel waveguides. This project involved research and development of a multi-channel electronic IC (integrated circuit) chip for parallel optical interconnect.

19. I was one of Motorola's most prolific inventors, having over 150 issued utility patents as an inventor or a co-inventor by the late 1990s. Many of the photonics, telecommunications, data-communications, electronics, cables, connectors, and optical prototypes with which I was involved were subject to reliability and stress testing that included humidity, temperature, optical, mechanical, and electrical evaluations. These consumer products for datacenter applications were driven by standard electronic ICs and electronic signaling, and I had a role in the design and simulation of these circuits.

20. Between 1998 and 1999, I worked as the Director of Technology/BD (Fiber Optics) for Tyco Electronics (previously AMP). I joined Tyco Electronics as a business development director and director of advanced technology for the telecommunications and data-communications industries that included switches, routers, and datacenters. I was responsible for developing technology related to

cables, connectors, and modules through external interactions that included mergers, acquisitions, strategic alliances, and technical strategic planning as well as leading new technology projects. The projects included popular cable connector jacks and plugs that incorporated high frequency and crosstalk mitigation designs such as twisted wire pairs. Much of that work involved the application of telecommunication and datacenter-based electronic and optoelectronic transceiver modules, electrical and optical connectors, plugs, jacks, and cables for customer qualification specifications.

21. In 1999, I left Tyco and started my employment at Intel. At Intel, I was involved heavily in photonic technology, especially technology that supported silicon photonic device platforms for datacenter applications. As a culmination of this work, I was one of the founders of Intel's silicon photonics division in 2000 and worked to set up a fabrication facility in South San Jose. The work involved integrating silicon FET electronics with optoelectronics that included arrayed waveguide gratings on the same silicon semiconductor wafer. I was also part of Intel Capital's optical investment team, and participated in over 30 investments in photonics, optics, and optoelectronics. Our team's focus included optical devices, packaging, and modules, and the technologies investigated included lasers, LEDs, optics, and optical displays.

22. At the end of 2000, I left Intel and raised venture capital funding for a company called Ignis Optics Inc. The main goal of the company was to design and manufacture, in high volume, very high-performance fiber optic transceiver modules, connectors, and associated optics with data rates up to OC-192, or approximately 10 Gbps for datacenter applications that utilized routers, switches, etc. The fiber optic transceiver modules have the capability of transmitting and receiving optical signals that are controlled using programmable electronics and packaged optoelectronics chips, such as laser diodes, optical lenses, and photodetectors.

23. In 2005, I took up employment for a trade association, based in Washington, D.C., called Optoelectronics Industry Development Association (OIDA). As head of this trade association, which included as members both electronics, photonics, and optics manufacturers as well as vendors for telecommunication, data-communication, datacenter cables, fiber optics, display, cameras, sensing, defense, aerospace, LED lighting, etc., I was responsible, in part, for industry-based technology roadmaps. I implemented common industry roadmap methodologies with common features such as “Red Brick Walls” and transferred them into technology roadmaps for the industry in which telecommunication cables, fiber-optic cables, optics, fiber, cameras, optical sensors, displays, and their associated

packaging/connectors, were featured. (OIDA roadmaps featured purple brick walls to show differentiation from the semiconductor industry.)

24. In 2010, I became the General Manager and CTO of Translucent, Inc., a high-tech start-up company which developed and manufactured silicon and rare earth oxide based epitaxial semiconductor wafers. I patented a number of electronic FET device designs using rare earth oxides while I was employed at Translucent.

25. Throughout my career, I have also had an active role in a number of technical professional organizations, including, among others, IEEE Components, Packaging, and Manufacturing Technology (CPMT), IEEE Electronic Components and Technology Conferences (ECTC), IEEE TC-10 (Technical Committee on Optoelectronics), and IEEE Optoelectronics Industry Development Association (OIDA). Through these organizations, I have consistently been a part of committees, events, and workshops relating to semiconductor, optoelectronics, electronics, and packaging technology.

26. I also serve as a Technical Expert/Consultant for the European Commission. In my work at the European Commission, I review and advise on general electronics, telecommunications, data-communications, datacenters, cable interconnects, connectors, semiconductors, photonics, optoelectronics, imaging, sensing, display

(LCD, LED, OLED etc.), and related ICT (Information and Communications Technology) technology.

27. My CV provides further information about my experience and qualifications and includes a listing of my patents. My CV also includes the publications I have authored and the matters on which I have served as an expert witness in the last 4-10 years.

III. LEGAL STANDARDS

A. Claim Construction

28. I have been informed by counsel and I understand that the first step in determining the patentability of a patent claim is for the claim terms to be properly construed. I understand that claim terms are construed in light of the claim language, the patent specification, and the prosecution history of the patent. I also understand that extrinsic sources, for example, dictionaries, treatises, textbooks, etc. may shed light into the meaning of claim terms. I further understand that a claim term is given its plain and ordinary meaning as understood by those skilled in the art if that claim term does not need construction.

B. Anticipation

29. I am not an attorney and have not been asked to offer my opinion on the law. However, as an expert offering an opinion on whether the Challenged Claims of the

'826 patent are unpatentable, I have been told that I am obliged to follow existing law.

30. I have been told the following legal principles apply to an analysis of patentability pursuant to 35 U.S.C. § 102, a provision in the patent law regarding anticipation. I have been told that, in an *inter partes* review proceeding, patent claims may be deemed unpatentable if it is shown by preponderance of the evidence that the claims were anticipated by prior art patents or printed publications.

31. I have been told that for a claim to be anticipated under § 102, every limitation of the claimed invention must be disclosed by a single prior art reference, viewed from the perspective of a person of ordinary skill in the art.

C. Obviousness

32. I have been told that under 35 U.S.C. § 103, “[a] patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.”

33. When considering the issues of obviousness, I have been told that I am to do the following:

- a. Determine the scope and content of the prior art;

- b. Ascertain the differences between the prior art and the claims at issue;
- c. Resolve the level of ordinary skill in the pertinent art; and
- d. Consider evidence of secondary indicia of non-obviousness (if available).

34. I have been told that the relevant time for considering whether a claim would have been obvious to a person of ordinary skill in the art is the time of alleged invention, which I have assumed is shortly before the effective filing date of the application leading to the '826 patent.

35. I have been told that any assertion of secondary indicia of non-obviousness must be accompanied by a nexus between the merits of the invention and the evidence offered.

36. I have been told that a reference may be combined with other references to disclose each element of the invention under § 103. I have been told that a reference may also be combined with the knowledge of a person of ordinary skill in the art and that this knowledge may be used to combine multiple references. I have also been told that a person of ordinary skill in the art is presumed to know the relevant prior art. I have been told that the obviousness analysis may account for the inferences and creative steps that a person of ordinary skill in the art would employ.

37. I have been told that whether a prior art reference renders a patent claim unpatentable as obvious is determined from the perspective of a person of ordinary skill in the art. I have been told that there is no requirement that the prior art contain an express teaching or suggestion to combine known elements to achieve the claimed invention, but that a motivation or rationale for combining prior art elements in a way that realizes the claimed invention is required to show obviousness, and that it seeks to counter impermissible hindsight analysis.

38. I have been told that when a work is available in one field, design alternatives and other market forces can prompt variations of it, either in the same field or in another. I have been told that if a person of ordinary skill in the art can implement a predictable variation and would see the benefit of doing so, that variation is likely to be obvious. I have been told that, when there is a design need or market pressure and there are a finite number of predictable solutions, a person of ordinary skill in the art has good reason to pursue those known options that realizes the claimed invention. In addition, I have been informed and I understand that there must be a reasonable expectation of success—not absolute predictability of success—in combining prior art teachings to arrive at the claimed invention.

IV. DEFINITION OF A PERSON OF ORDINARY SKILL IN THE ART

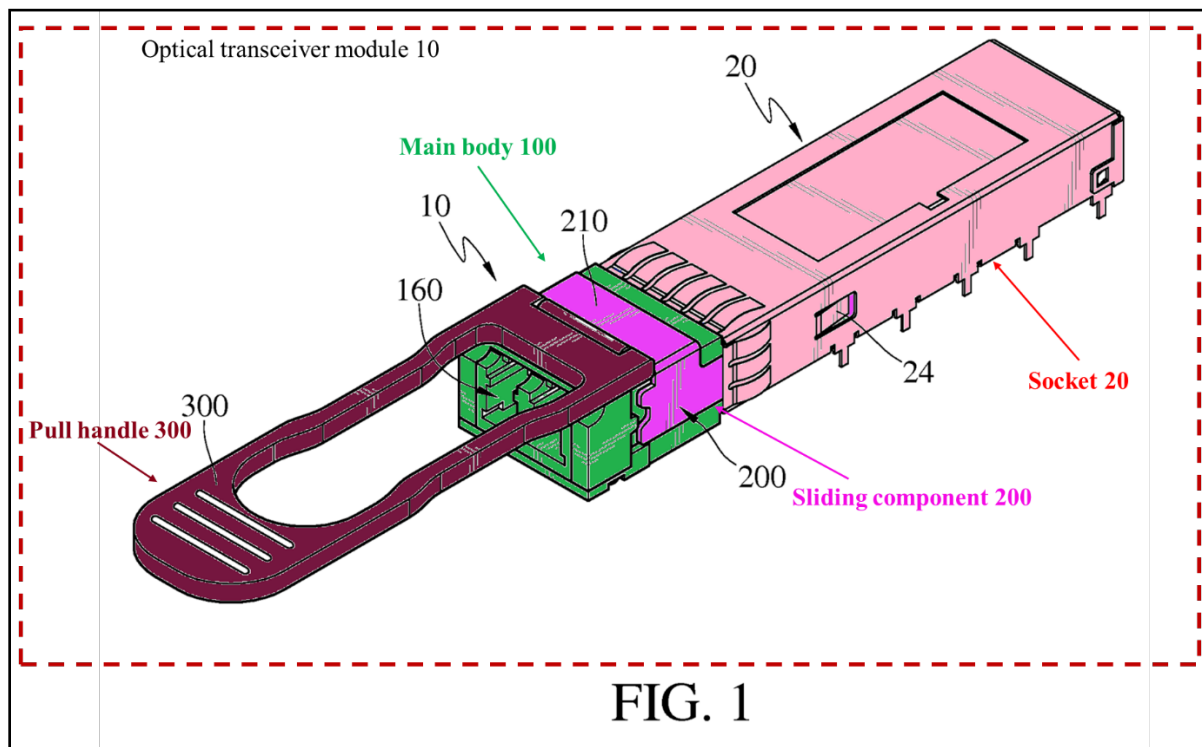
39. At the effective filing date of the '826 patent, a person of ordinary skill in the art ("POSITA") would have had (1) a bachelor's degree in electrical or electronics

engineering or an equivalent degree, and (2) 2-4 years of work experience in optoelectronics, optical networking, optical communications, or a closely related field.

40. Based on my background and experience described in Section II, above, I qualify as a POSITA in the technology field related to the '826 patent.

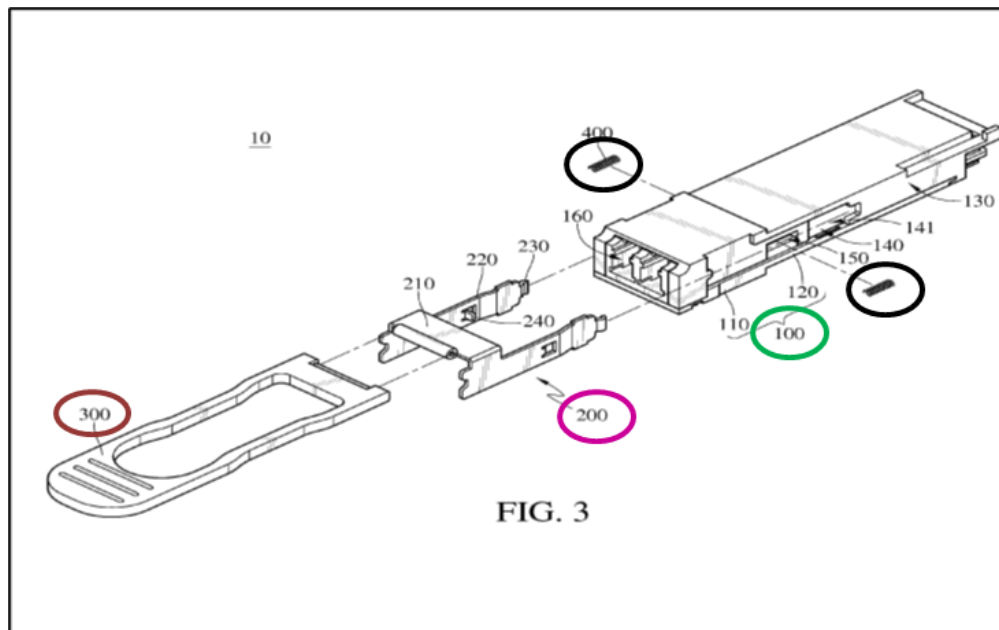
V. RELEVANT TECHNICAL BACKGROUND AND OVERVIEW OF THE '826 PATENT

41. The '826 patent is directed to a pluggable optical transceiver module configured to be inserted into a plugging slot of a socket. Ex. 1001, Title, Abstract, 1:57-58, 2:47-58. A pluggable optical transceiver module 10 of the '826 patent comprises, among other things, a **main body 100** having a head part 110 and an inserted part 120, a **sliding component 200**, a **pull handle 300**, and two **elastic components 400**, as shown in Figure 3 (below). *Id.*, 2:59-3:1.



Ex. 1001, Fig. 1 (annotations added)

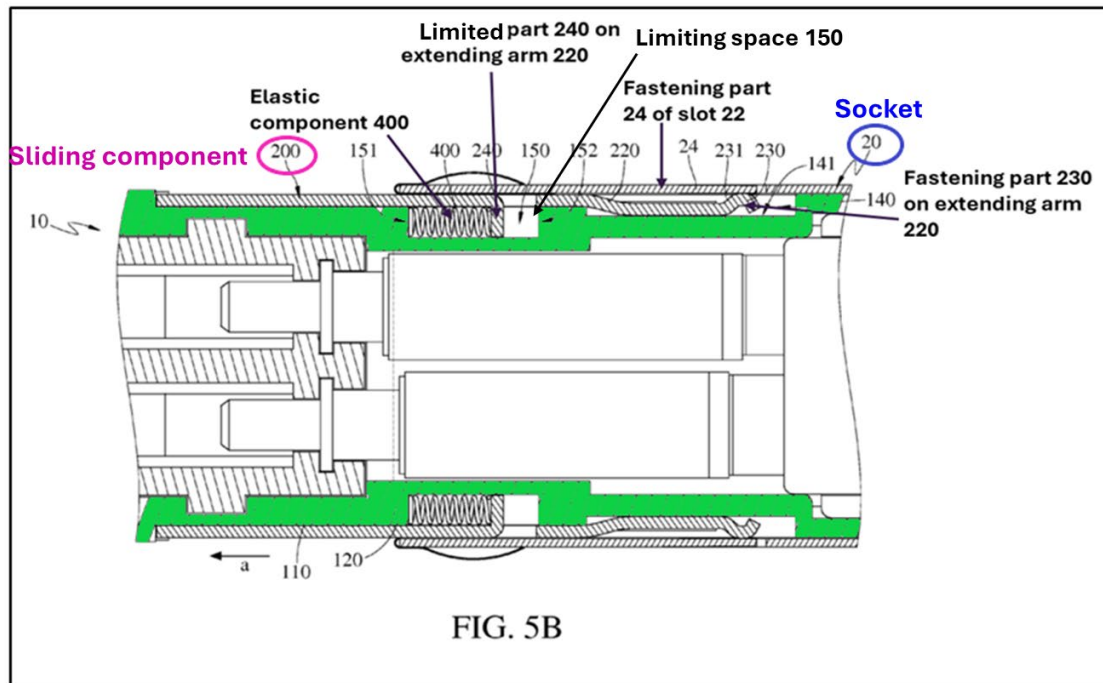
42. As described in the '826 patent, “[t]he main body 100 has two side surfaces 130, two sliding slots 140 and two limiting spaces 150. ... The two sliding slots 140 are located at the two side surfaces 130, respectively, and extend from the head part 110 to the inserted part 120. Each sliding slot 140 has a bottom surface 141 which is, but not limited to, parallel to the side surface 130. ... The two limiting spaces 150 are located at the bottom surfaces 141 of the two sliding slots 140, respectively. Each limiting space 150 has a first limiting surface 151 and a second limiting surface 152 ... [that] are connected to the bottom surface 141. The first limiting surface 151 is closer to the head part 110 than the second limiting surface 152.” *Id.*, 3:1-17.



Ex. 1001, Fig. 3

43. As shown in Figure 3, above, sliding component 200 includes two extending arms 220 and a linkage arm 210. The two extending arms 220 are slidably disposed on the two sliding slots 140 of main body 100. *Id.*, 3:29-56. The sliding component can slide relative to the main body 100 to have a fastening position and a releasing position. *Id.* The pull handle 300 can pivot about the sliding component 200 to slide the sliding component 200 between the fastening position and the releasing position. *Id.*, 3:57-63. Each elastic component 400 is disposed in a respective limiting space 150. *Id.*, 4:13-24. When pluggable transceiver 10 is inserted into the plugging slot 22 of socket 20, two first fastening parts 24 of slot 22 are fastened to two second fastening parts 230 on extending arms 220 (of sliding component 200) and the two elastic components 400 are pressed onto two limited parts 240 of extending arms

220, and thereby pluggable optical transceiver module 10 is located in a stable position in plugging slot 22. *Id.*, 4:25-42, Fig. 5B (annotated below).



Ex. 1001, Fig. 5B (annotated to show (1) engagement of **sliding component 200** with plugging slot 22 of **socket 20** via fastening parts 230 and 24 on extending arm 220 and slot 22, respectively; and (2) engagement of limited part 240 with elastic component 400 disposed in limiting space 150 on the side surface of **main body 100**))

44. But as discussed below, optical transceiver modules with same structure, function, and operation were well known before the effective filing date of the '826 patent.

VI. CLAIM CONSTRUCTION

45. There are no claim terms that require construction to resolve the controversies in the IPR petition accompanying this Declaration. I have applied the plain and ordinary meaning of all claims terms for the '826 patent.

VII. OVERVIEW OF THE PRIOR ART

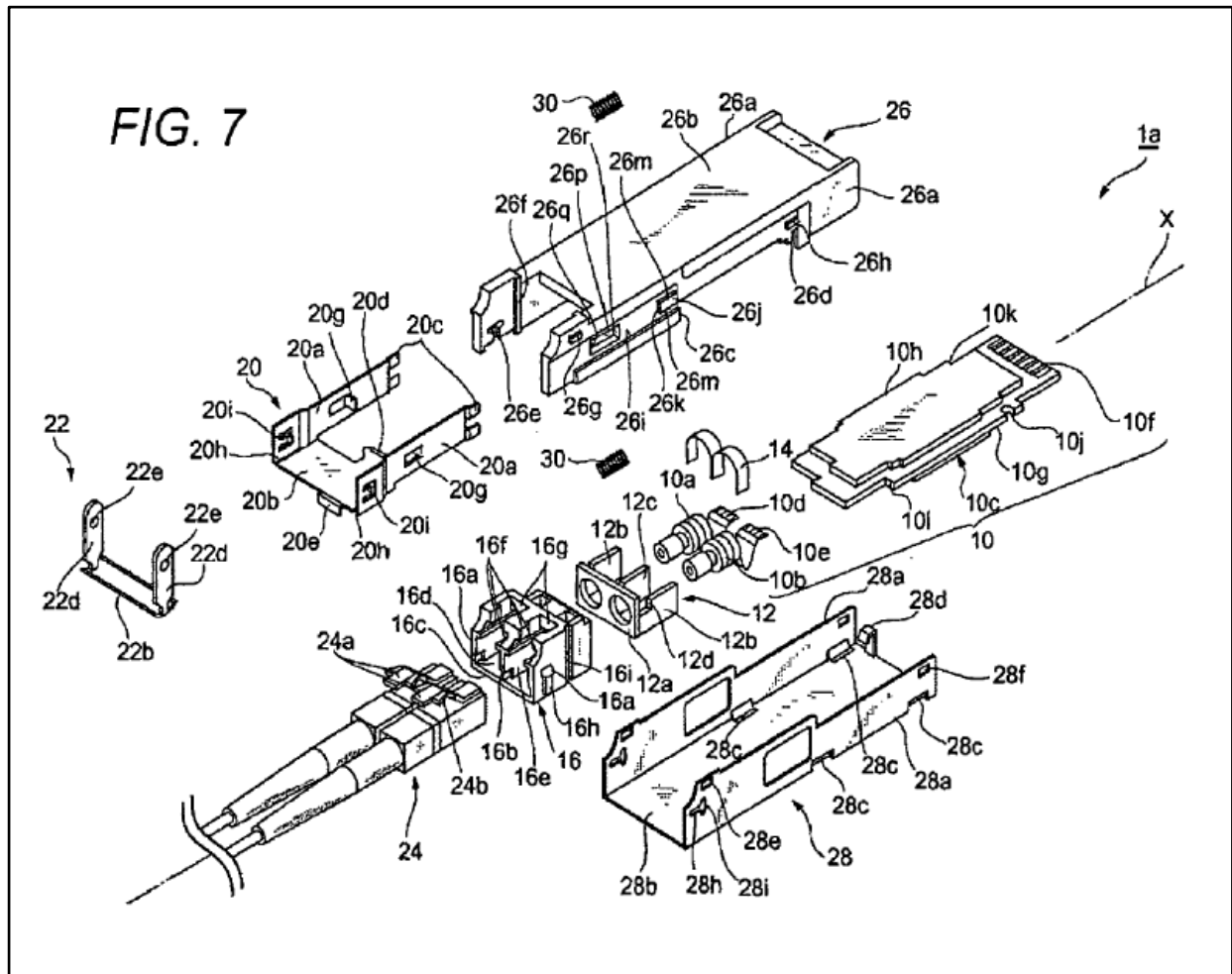
A. Mizue (Ex. 1004)

46. U.S. Patent No. 7,201,520 to Mizue et al. (hereinafter “Mizue”) issue on April 10, 2007, and is therefore prior art to the '826 patent.

47. Mizue discloses “an optical module having a pluggable configuration, which enables to latch with the cage” of a host device. Ex. 1004, Abstract; *see also id.*, 1:8-9, 1:34-36. Specifically, Mizue discloses that optical module 1 (and versions 1*a*, 1*b* thereof) are plugged into a cage 4 (plugging slot of a socket) installed on a host board 2. *Id.*, Fig. 1, 3:19-21, 7:4-12, 8:2-10; *see also id.*, 3:31-35 (“The front end 4*d* of the cage 4 has an opening through which the optical module 1 is inserted into the space.”).

48. Mizue’s Figure 7 is an exploded view of optical module 1*a*, which “includes a primary unit 10, a holder 12, a bracket 14, a receptacle body 16, a housing 18, an actuator 20 and a bail 22 [for sliding actuator 20]” as well as “a spring 30.” Ex. 1004, 7:4-12. Housing 18 includes an upper body 26 and a lower body 28 that are assembled together and primary unit 10 is housed in the space sandwiched between

the upper and the lower bodies. *Id.*, Fig. 7. Receptacle 16, holder 12, and bracket 14 are assembled to facilitate coupling of an optical connector 24 with the optical sub-assemblies within primary unit 10. *Id.*

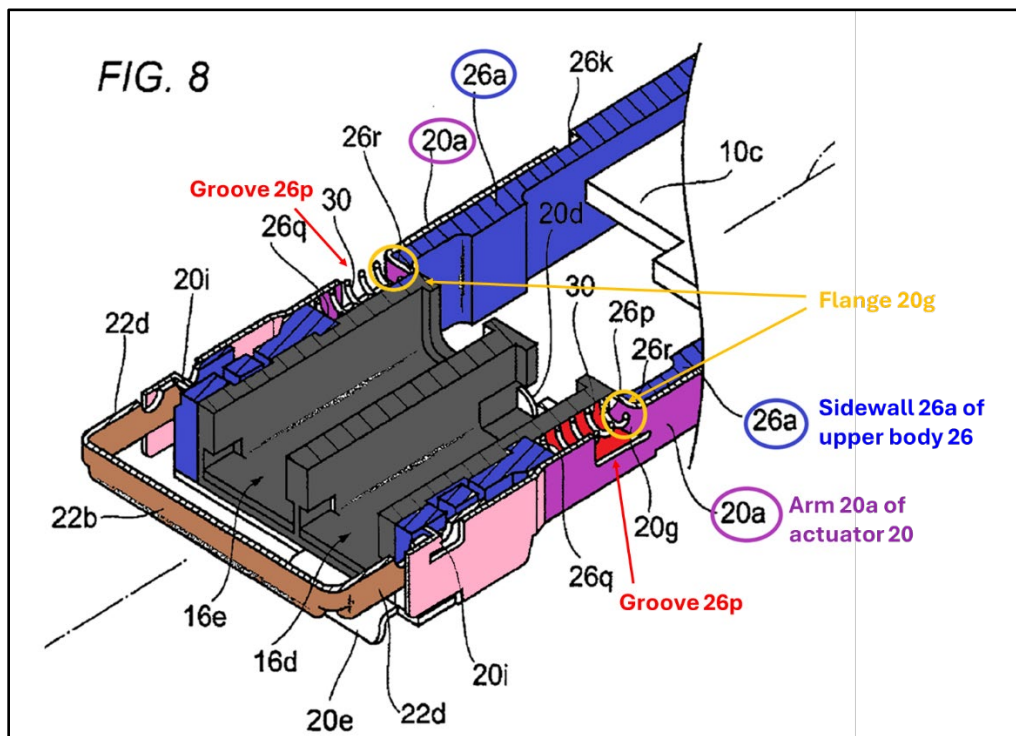


Ex. 1004, Fig. 7

49. The actuator 20 includes arms 20a that slide on groove 26i of upper body 26 between a first (fastening position) and a second (releasing position). *Id.*, 1:51-2:12, Fig. 7. Arms 20a further include flanges 20g that are configured to be inserted in

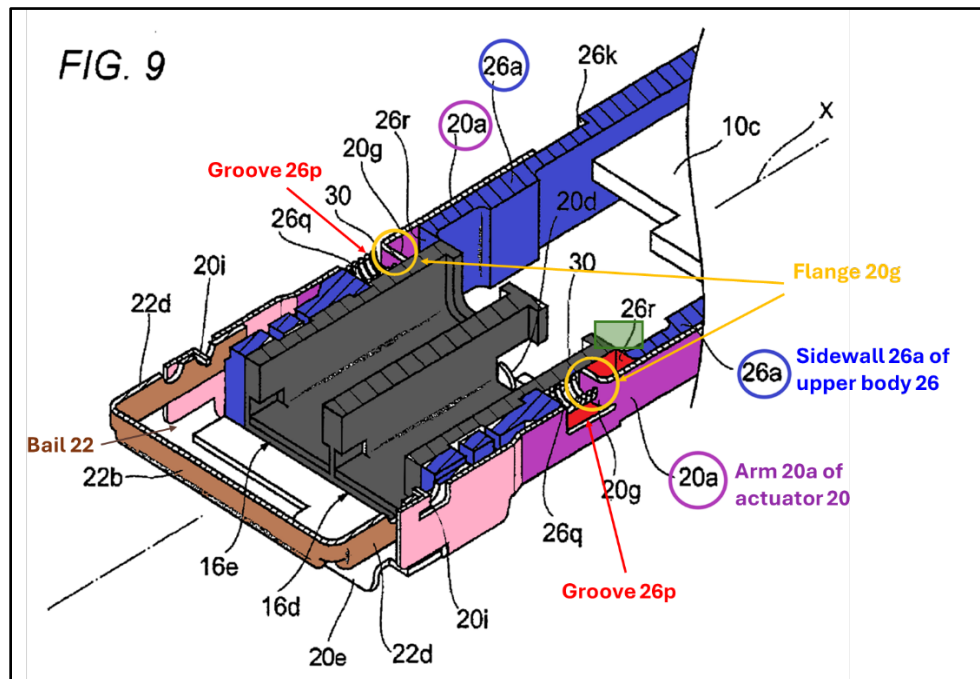
respective grooves 26p provided in the sidewalls 26a of upper body 26. *Id.*, 7:26-37. Each “groove 26p has a pair of inner surfaces 26q and 26r, both extending in the direction intersecting the axis X. A spring 30 is inserted between the other flange 20g and one of the inner surface 26q of the groove 26p.” *Id.*

50. Figure 8 of Mizue is a cross-sectional view of the optical module 1a and “shows the state when actuator 20 is pushed therein,” i.e., when the actuator is set in the first (fastening) position. *Id.*, 7:39-47. The spring 30 “normally holds the actuator 20 in the [first] position such that the latch 4e of the cage 4 may not release from the projection in the upper body.” *Id.*



Ex. 1004, Fig. 8 (annotations added)

51. Figure 9 show “the state that the actuator 20 is pulled out. The spring is shrank [sic] by the flange 20g, and the latch 4e of the cage 4 is released from the projection 26i of the upper body 26.” *Id.*, 7:48-54.



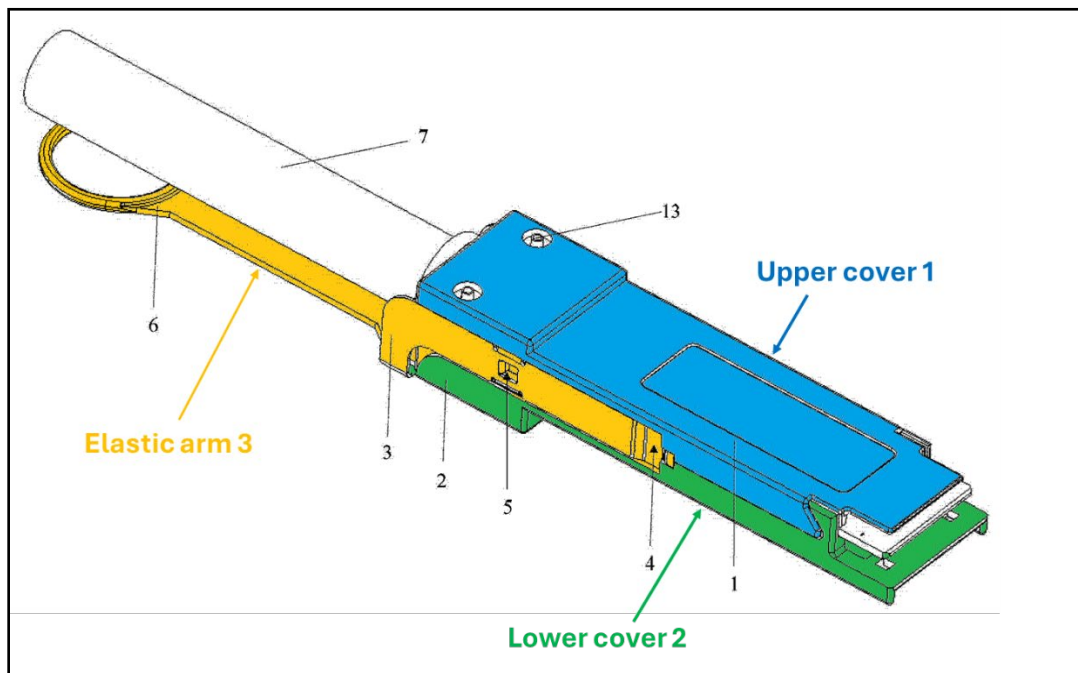
Ex. 1004, Fig. 9 (annotations added)

B. Li (Ex. 1005)

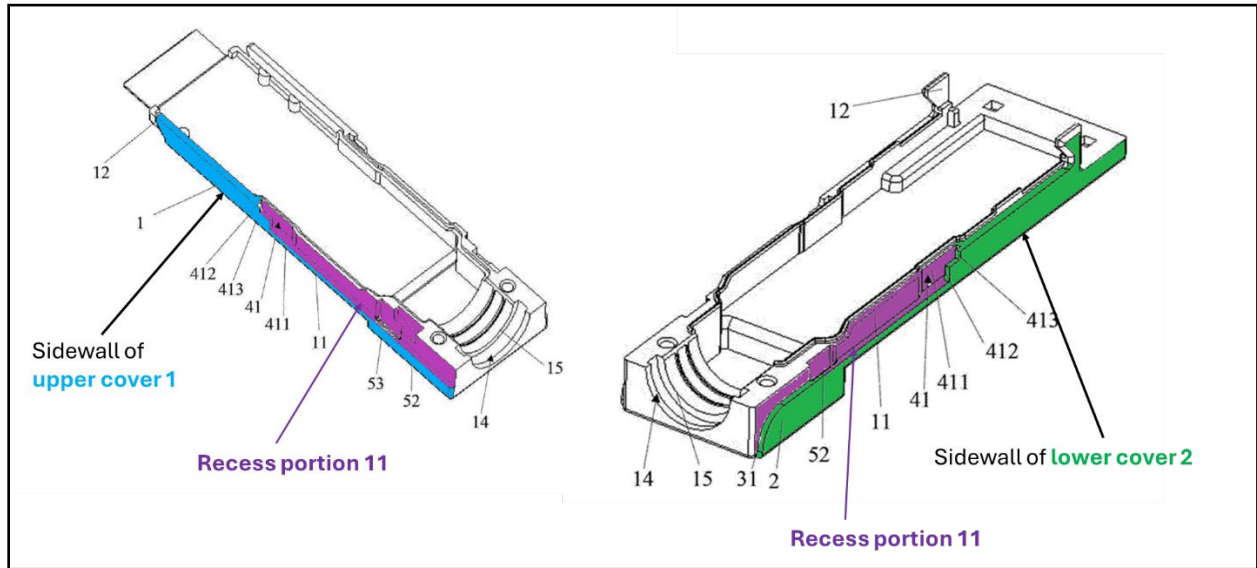
52. Chinese Utility Model No. CN 203026708 U to Li et al. (hereinafter “Li”) issued June 26, 2013, and is therefore prior art to the ’826 patent.

53. Li discloses a QSFP module interface device that is capable of “conveniently and effectively achieving hot plugging.” Ex. 1005, Abstract, ¶[0002], ¶[0003], Figs. 1 and 2. Li’s QSFP module interface device includes “an upper cover 1, a lower

cover 2, and elastic arms 3,” as shown in Figure 1 (annotated below). *Id.*, ¶[0022], Figs. 1 and 2. “Two opposite sides of the upper cover 1 are connected to the lower cover 2 at connecting positions, and the connecting positions have first recess portions 11 recessed thereon.” *Id.*, ¶[0022], Figs. 1, 2, 4, 5. “The elastic arm 3 is engaged with the first recess portion 11 and capable of sliding along a track formed by the first recess portion 11.” *Id.*, ¶[0022].



Ex. 1005, Fig. 1 (showing the QSFP module interface device of Li)

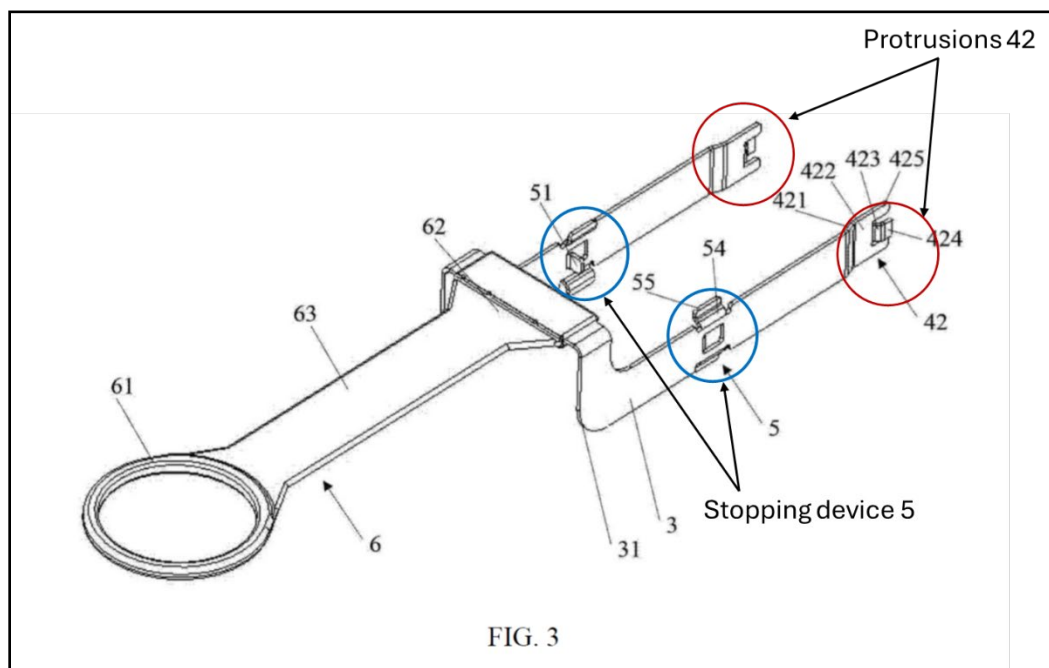


Ex. 1005, Figs. 4 and 5 (showing a **recess portion 11** on the sidewalls of **upper cover 1** and **lower cover 2**)

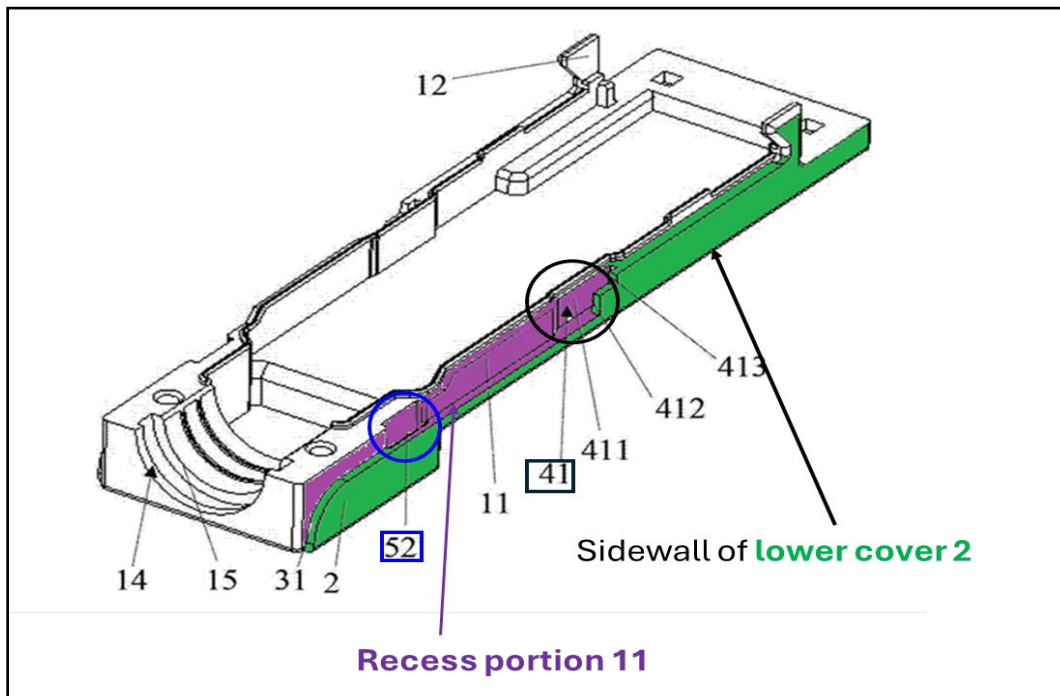
54. Li's QSFP module interface device also includes an "unlocking device 4," which is "provided between the elastic arm 3 and the first recess portion 11. The unlocking device 4 includes a second recess portion 41 recessed within the first recess portion 11 and a protrusion 42 disposed on the elastic arm 3, and the second recess portion 41 and the protrusion 42 engage with each other." *Id.*, ¶[0023], Figs. 4 and 5 (showing second recess portion 41 within the first recess portion 11). When "pulling ring 6 connected to the elastic arm 3" is pulled, "the elastic arm 3 can be driven to slide along the first recess portion 11, enabling the unlocking device 4 to achieve the unlocking operation" by disengaging protrusion 42 from the second recess portion 41. *Id.*, ¶[0023], [0028]. Meanwhile, second bent portion 423 of

protrusion 42 “pushes away an elastic piece connected to a slot module,” where the QSFP module interface device is plugged in, thus “allowing the QSFP module interface device to be smoothly unplugged.” *Id.*, ¶[0023].

55. The QSFP module interface device further includes a stopping device 5, which includes, among other things, “a stopping member 51 vertically disposed on the elastic arm 3 and a third recess portion 52 recessed within the first recess portion 11.” *Id.*, ¶¶[0024], [0025], Figs. 4 and 5 (showing third recess portion 52 within the first recess portion 11). The stopping member 51 is configured to engage with third recess portion 52. *Id.*



Ex. 1005, Fig. 3 (showing protrusions 42 and stopping devices 5 on elastic arm 3)



Ex. 1005, Fig. 5 (showing **first recess portion 41** and **second recess portion 52** within the first recess portion 11)

56. The stopping device 5 further includes “a return spring device (not shown), which is connected between the stopping member 51 and the third recess portion 52.” Ex. 1005, ¶[0027]. The spring has “one end abutting against the stopping member 51 and the other end abutting against the side end of the third recess portion 52 opposite to the stopping member 51.” *Id.* After the QSFP module interface device is unlocked from the slot module, “the elastic arm 3 has a rebound force under the action of the spring. Driven by the rebound force, the elastic arm 3 slides back along the first recess portion 11, and the protrusion 42 and the second recess portion 41

return to their engaged state, thereby achieving the reset of the QSFP module interface device” after it is unlocked. *Id.*

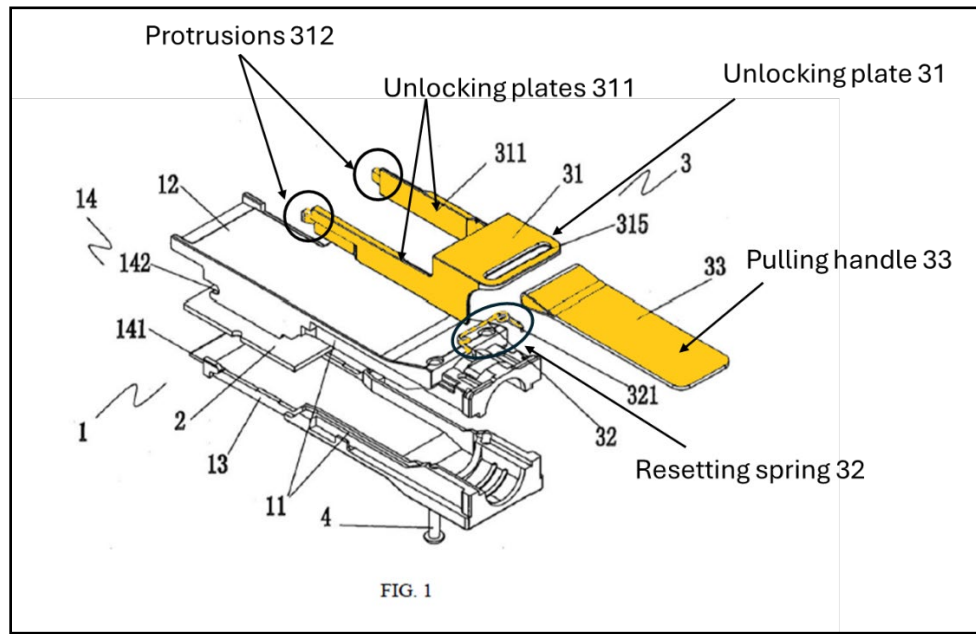
C. Liu (Ex. 1006)

57. Chinese Utility Model No. CN 201749226 U to Liu et al. (hereinafter “Liu”) issued February 16, 2011, and is therefore prior art to the ’826 patent.

58. Liu discloses a QSFP interface module structure, comprising “a module housing and a PCB board installed inside the module housing.” Ex. 1006, Abstract, ¶[0006]. The module housing further includes “a locking mechanism installed thereon to lock the module housing to an external interface. The locking mechanism includes an unlocking member and a resetting spring installed between the unlocking member and the module housing.” *Id.*

59. More specifically, Liu’s QSFP interface module structure includes “a housing 1 composed of an upper shell 12 and a lower shell 13, a PCB board 2 installed inside the housing 1, and a locking mechanism 3 installed on the housing 1 to facilitate quick plugging and unplugging of the entire module.” *Id.*, ¶[0017]. “[T]he locking mechanism 3 includes an unlocking member 31 and a resetting spring 32 installed between the unlocking member 31 and the housing 1. The front section of the unlocking member 31 includes two unlocking plates 311 located on two sides of the housing 1. The outer sides of the ends of the two unlocking plates 311 are provided with unlocking protrusions 312. ... The rear end of the unlocking member 31 is

connected to a pulling handle 33.” *Id.*, ¶[0019]. The “two sides of housing 1 are provided with grooves 11 to accommodate the unlocking plates 311.” *Id.*



Ex. 1006, Fig. 1 (showing components of Liu’s locking mechanism 3)

60. “When the present module is plugged into a corresponding socket of a connector, locking members pre-configured in the socket engage with the protrusions 312 on the outer walls of the two unlocking plates 311. When the present module needs to be unplugged, the pulling handle 33 can be simply pulled outward, so that the unlocking member 31 is pulled by the pulling handle 33 to move outward. Meanwhile, the protrusion 312 and the inclined surface 313 on the unlocking plate 311 push the locking member of the socket out, so that the module can be smoothly unplugged.” *Id.*, ¶[0020].

VIII. [GROUND 1] CLAIMS 1-7 ARE ANTICIPATED BY MIZUE

A. Independent claim 1

61. Mizue discloses each and every limitation of claim 1.

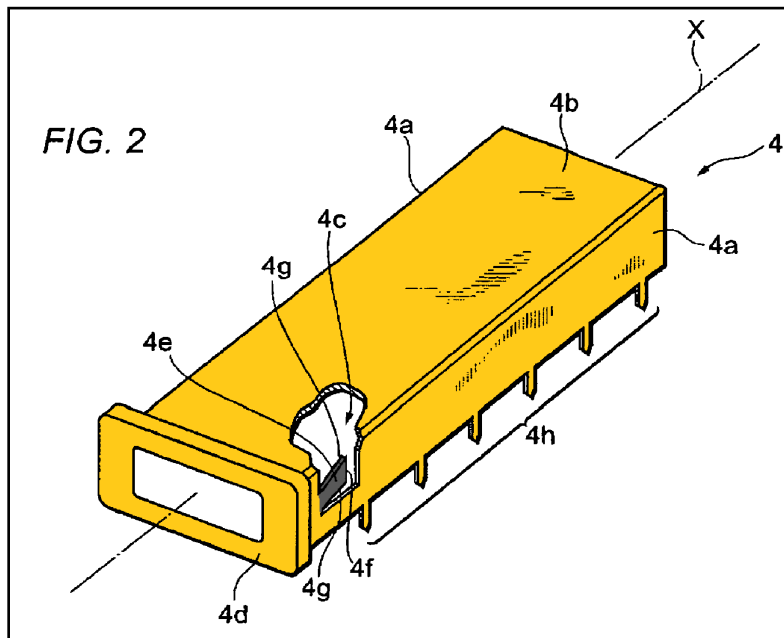
1. **1[preamble] (“A pluggable optical transceiver module, for being inserted into a plugging slot of a socket, the socket comprising two first fastening parts located in the plugging slot, the pluggable optical transceiver module comprising:”)**

62. Mizue discloses “an optical module having a pluggable configuration, which enables to latch with the cage” of a host device. Ex. 1004, Abstract; *see also id.*, 1:8-9 (“This invention relates to an optical module, especially, an optical module having a hot-pluggable function”), 1:34-36. Specifically, Mizue discloses that optical module 1 (and versions 1*a*, 1*b* thereof), which are optical transceiver modules, are plugged into a slot of cage 4 (socket) installed on a host board 2. *Id.*, Fig. 1, 3:19-21, 7:4-12, 8:2-10; *see also id.*, 3:32-34 (“The front end 4*d* of the cage 4 has an opening through which the optical module 1 is inserted into the space [i.e., slot].”).

63. Even though Mizue does not include an express discussion of the combination of module 1*a* with cage 4, Mizue discloses that optical module 1*a* is “similar” to optical module 1 (*id.*, 7:4-80) and provides a common description of how the disclosed optical modules realize their “pluggable function” with a cage (*id.*, 1:34-58). Mizue also discusses engagement between module 1*a* and cage 4. *Id.*, 7:43-50 (discussing latches 4*e* of cage 4 engaging and disengaging projections 26*j* on the

sidewalls 26*a* of main body 26 of module 1*a*, thus indicating that module 1*a* is configured to be inserted into cage 4). Moreover, it is common practice in the industry to insert an optical transceiver module into a cage of a host device. Accordingly, a POSITA would have readily envisaged from Mizue's disclosure that optical module 1*a* plugs into a cage 4 in the same manner as optical module 1.

64. As Mizue discloses in relation to optical module 1, which is equally applicable to module 1*a*, cage 4 (socket having plugging slot) includes two latches 4*e* (first fastening parts) on the sidewalls 4*a* of the cage, as shown in Figure 2, below. Ex. 1004, 3:37-40 ("Respective side walls include a latch 4*e* extending there from and protruding into the space 4*c* [where optical module 1 is received]. Such that the edge thereof points to the rear. Further, the latch 4*e* may be resilient and bend toward the outside of the space 4*c*."), 3:29-35.

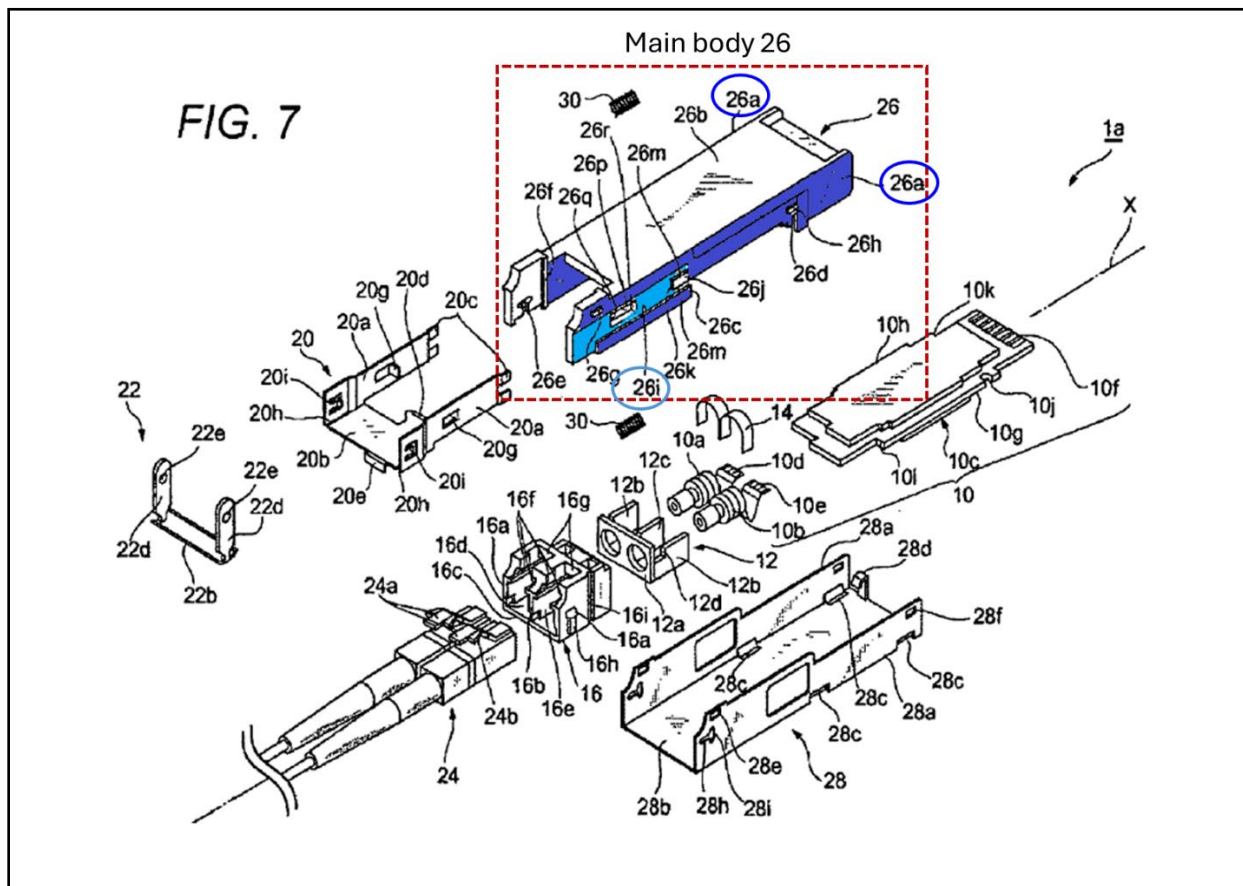


Ex. 1004, Fig. 2 (showing **cage 4** (socket) having sidewalls 4a, each sidewall having a **latch 4e** (first fastening part) extending into space 4c (slot) inside the cage)

2. **Claim term 1[a][1]** (“a main body having two side surfaces that are opposite to each other and two sliding slots located at the two side surfaces, respectively, wherein the main body is configured to be inserted into the plugging slot”)

65. Mizue’s optical module 1a (pluggable optical transceiver module) has an upper body 26 that serves as the main body of the optical module. Ex. 1004, 7:4-12, Figs. 7-9. As shown in annotated Figure 7, below, upper body 26 (main body) has two **side surfaces (sidewalls 26a)** that are opposite each other. *Id.*, Fig. 7. Each side surface has a **sliding slot (groove 26i)** located thereon. *Id.* A POSITA would have understood from the disclosure of Mizue that the main body is configured to be inserted into space 4c (plugging slot) of cage 4. *See, e.g.*, 1:37-40, 3:19-28, and 7:43-

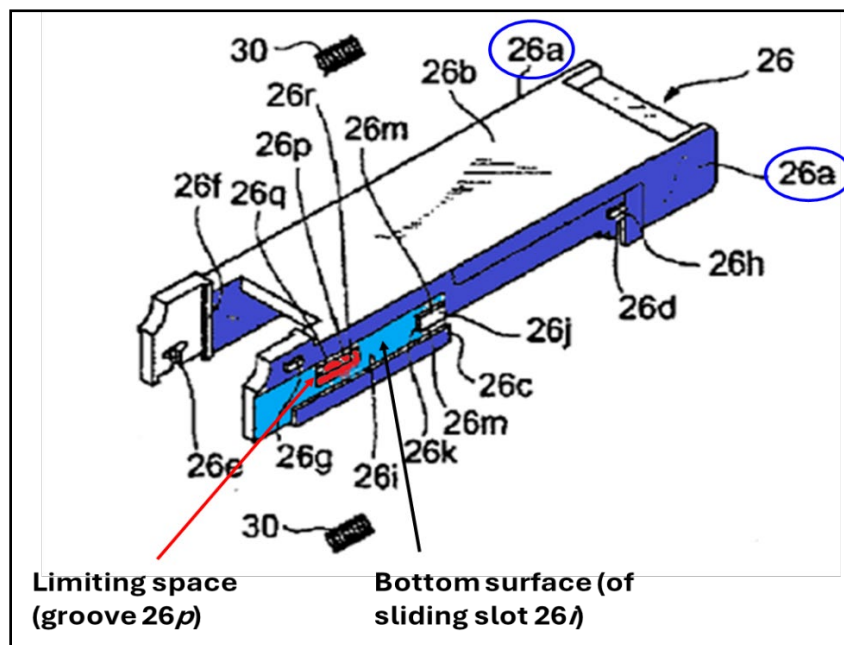
50 (discussing latches 4e of cage 4 engaging and disengaging projections 26j on the sidewalls 26a of upper body 26 (main body), thus indicating that the main body of module 1a is configured to be inserted into cage 4), Fig. 1 (showing optical module 1, which is similar to optical module 1a, being inserted into cage 4), 3:32-34 (“The front end 4d of the cage 4 has an opening through which the optical module 1 is inserted into the space.”).



Ex. 1004, Fig. 7 (showing upper body 26 (main body) having **side surface 26a** with **sliding slots 26i** located on the side surfaces)

3. Claim term 1[a][2] (“wherein the main body has at least one limiting space and two bottom surfaces forming the two sliding slots, respectively, the two bottom surfaces are parallel to the two side surfaces, the at least one limiting space is located at one of the two side surfaces”)

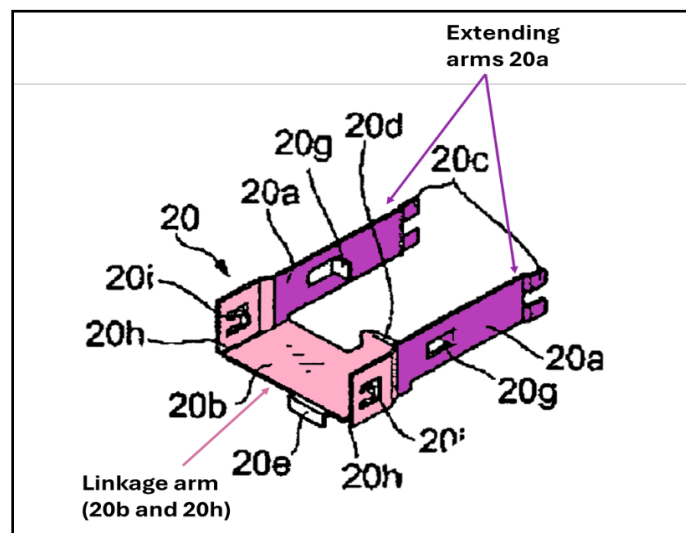
66. The main body (upper body 26) includes **grooves 26p (limiting spaces)** formed within **grooves 26i (sliding slots)** of the two **side surfaces (sidewall 26a)**. Ex. 1004, Fig. 7, 7:30-37 (discussing groove 26p). Furthermore, each groove 26i (sliding slot) has a bottom surface that forms the sliding slot, and the two bottom surfaces of the two sliding slots are parallel to the side surfaces (sidewalls 26a). *Id.*, Fig. 7. Furthermore, each groove 26p (limiting space) is located at a respective side surface 26a. *Id.*



Ex. 1004, Fig. 7 (excerpted to show only upper body 26 (main body) of optical module 1a)

4. **Claim term 1[b][1] (“a sliding component comprising a linkage arm and two extending arms, wherein the two extending arms are connected to two ends of the linkage arm, respectively, each extending arm has a second fastening part, the main body is between the two extending arms”)**

67. Optical module 1a includes an actuator 20 (sliding component) comprising two arms 20a (extending arms), and a center portion 20b and front side walls 20h that together form a linkage arm, and wherein the two extending arms are connected to the two ends of the linkage arm. Ex. 1004, Fig. 7, 7:16-19.



Ex. 1004, Fig. 7 (excerpted to only show actuator 20)

68. Furthermore, each arm 20a (extending arm) has a second fastening part (slab 20c) at the tip of the arm. *Id.* Although Mizue does not expressly disclose the contact between slabs 20c (second fastening parts) and latches 4e (first fastening parts) of cage 4 with respect to optical module 1a, Mizue provides such details with respect to optical module 1 shown in Figure 4. *Id.*, 5:54-65 (“The tip portion of the arm 20a

is forked and the forked slabs 20*c* puts the projection 26*j* in the groove 26*i* therebetween. **The forked slabs 20*c* is bent toward the outer side of the optical module such that, when sliding the actuator 20 toward the front side, the forked slab 20*c* is in contact with the latch 4*e* and presses the latch toward the outer side of the optical module 1.** In other words, the span between the forked slab in respective arms 20*a* is greater than the length of the center portion 20*b*, accordingly, sliding the actuator with the arms 20*a* in the groove 26*i*, **the forked slab presses the latch 4*e* outward and releases the latching between the projection 26*i* and the latch 4*e*.**”) (emphases added).

69. Given 1) the similarities in design between optical modules 1 and 1*a*, particularly the similarities in the arrangement of slabs 20*c*, projections 26*j*, and latches 4*e* of optical modules 1 and 1*a*, 2) Mizue’s disclosure that optical modules 1 and 1*a* are indeed “similar,” and 3) Mizue’s disclosure that “[i]n the description and the drawings, the same symbols and numerals without overlapping explanations will refer [to the] same elements,” a POSITA would have readily envisaged that contact between slabs 20*c* (second fastening parts) and latches 4*e* (first fastening parts) of optical module 1*a* is the same as the contact between those elements of optical module 1. Ex. 1004, 3:16-18, 7:4-8, Figs. 4 and 7. Thus, a POSITA would have

5. Claim term 1[b][2] (“the two extending arms are slidably disposed on the two sliding slots to have a fastening position and releasing position”)

71. The extending arms 20*a* of actuator 20 are disposed on the sliding slots (grooves 26*i*) of the main body (upper body 26). Ex. 1004, 1:64-65 (“The housing may has [*sic*] a groove for receiving the arm of the actuator. The arm may slide in the groove.”), Figs. 7-9. Given 1) Mizue’s disclosure that optical modules 1 and 1*a* are “similar” and 2) Mizue’s disclosure that “[i]n the description and the drawings, the same symbols and numerals without overlapping explanations will refer [to the] same elements,” a POSITA would have readily envisaged that engagement between extending arms 20*a* and grooves 26*i* would be same as the engagement between those elements of optical module 1. Ex. 1004, 3:16-18, 7:4-8, Figs. 4 and 7. With respect to optical module 1, Mizue discloses that “[t]he actuator 20 has a pair of arms 20*a* and a center portion 20*b* connecting respective arms 20*a*. The arm 20*a* is received in the groove 26*i* provided in the side wall 26*a* of the upper body 26. That is, the arm 20*a* of the actuator is set into the groove 26*i* of the upper body 26 and the groove 26*i*, with the arm 20*a* set therein, covered with the lower body. Therefore, the actuator 20 enables to slide only in the direction along the axis X.” Ex. 1004, 5:46-53. A POSITA would have readily recognized that extending arms 20*a* of optical module 1*a* are disposed on the sliding slots (grooves 26*i*) in the manner as in

optical module 1. *See also id.*, 7:38-54 (discussing engagement of actuator 20 with upper body 26 of optical module 1a).

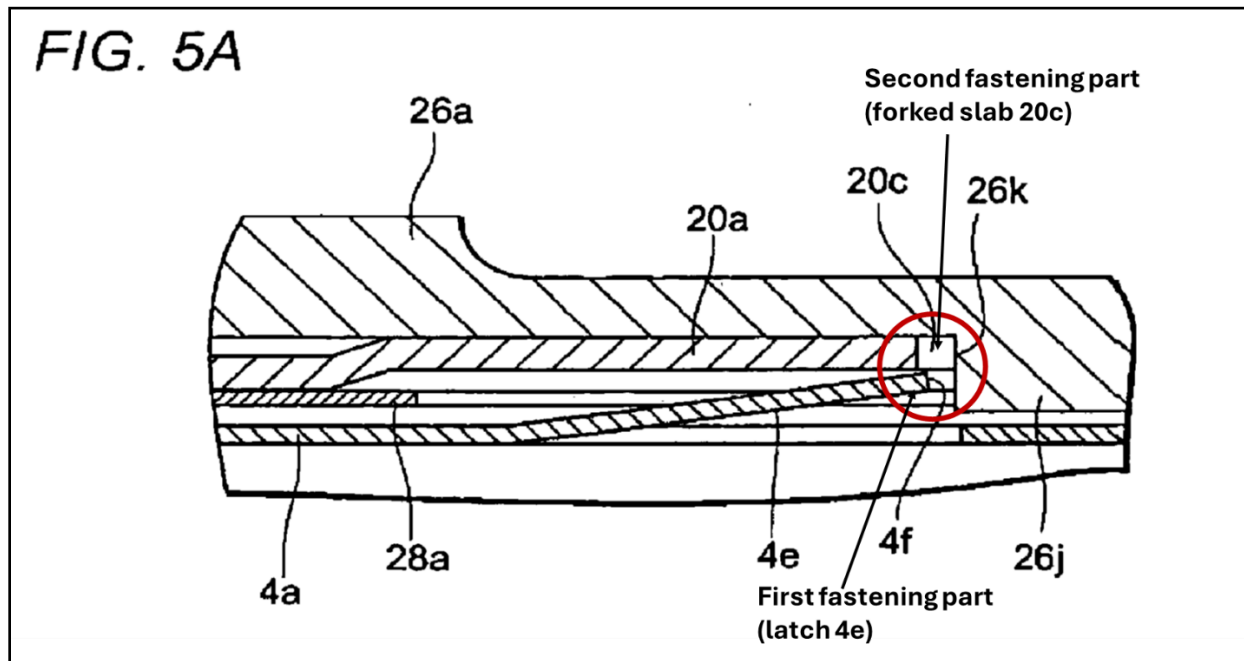
72. A POSITA would have further understood that extending arms 20a of optical module 1a are disposed on the sliding slots (grooves 26i) in a fastening position “when actuator 20 is pushed therein,” as shown in Figure 8, and in a releasing position when “the actuator 20 is pulled out,” as shown in Figure 9. *Id.* As Mizue explains, “FIG. 8 is a cross sectional view of the optical module 1a illustrated in perspective, and shows the state when **actuator 20 is pushed therein**. The spring 30, in the ordinal position, presses the other flange 20g to touch the other surface 26r of the groove 26p, and the flange 20d, provided in the center portion 20b of the actuator, is set **in the first [fastening] position**. ... FIG. 9 is also a partially cut perspective view showing the state that **the actuator 20 is pulled out**. The spring is shrank [*sic*] by the flange 20g, and the latch 4e of the cage 4 is released from the projection 26i of the upper body 26.” *Id.* (emphases added).

6. **Claim term 1[b][3] (“the two first fastening parts are fastened to the two second fastening parts when the two extending arms are located at the fastening position, and the two second fastening parts press the two first fastening parts, respectively, to make the two first fastening parts be farther away from each other when the two extending arms are located at the releasing position”)**

73. Given 1) the similarities in design between optical modules 1 and 1a, particularly the similarities in the arrangement of slabs 20c, projections 26j, and

latches 4e of optical modules 1 and 1a, 2) Mizue's disclosure that optical modules 1 and 1a are indeed "similar," and 3) Mizue's disclosure that "[i]n the description and the drawings, the same symbols and numerals without overlapping explanations will refer [to the] same elements," a POSITA would have readily envisaged that contact between slabs 20c (second fastening parts) and latches 4e (first fastening parts) of optical module 1a is the same as the contact between those elements of optical module 1. Ex. 1004, 3:16-18, 7:4-8, Figs. 4 and 7.

74. As Mizue discusses with regard to optical module 1, which is equally applicable to optical module 1a, in the fastening position (i.e., when actuator 20 is pushed in), the forked slabs 20c (second fastening parts) are attached, i.e., fastened, to latches 4e (first fastening parts) of cage 4, as shown in Figure 5A (annotated below). Ex. 1004, 5:54-6:11. Because projections 26j, which are wedged between respective forked slab 20c, are coupled to latches 4e, the forked slabs 20c are further secured/fastened to latches 4e in the fastening position. *Id.*



Ex. 1004, Fig. 5A (showing attachment between the first and second fastening parts in the fastening position)

75. Mizue further discloses that in the releasing position, i.e., when actuator 20 is pulled out, each forked slab 20c, which “is bent toward the outer side of the optical module” and “is in contact with the latch 4e,” “**presses the latch toward the outer side of the optical module 1**. In other words, the span between the forked slab in respective arms 20a is greater than the length of the center portion 20b, accordingly, sliding the actuator with the arms 20a in the groove 26i, **the forked slab presses the latch 4e outward** and releases the latching between the projection 26i and the latch 4e.”). Ex. 1004, 5:54-65 (emphases added), Fig. 5B. That is, when the extending arms 20a are in the releasing position, the two second fastening parts

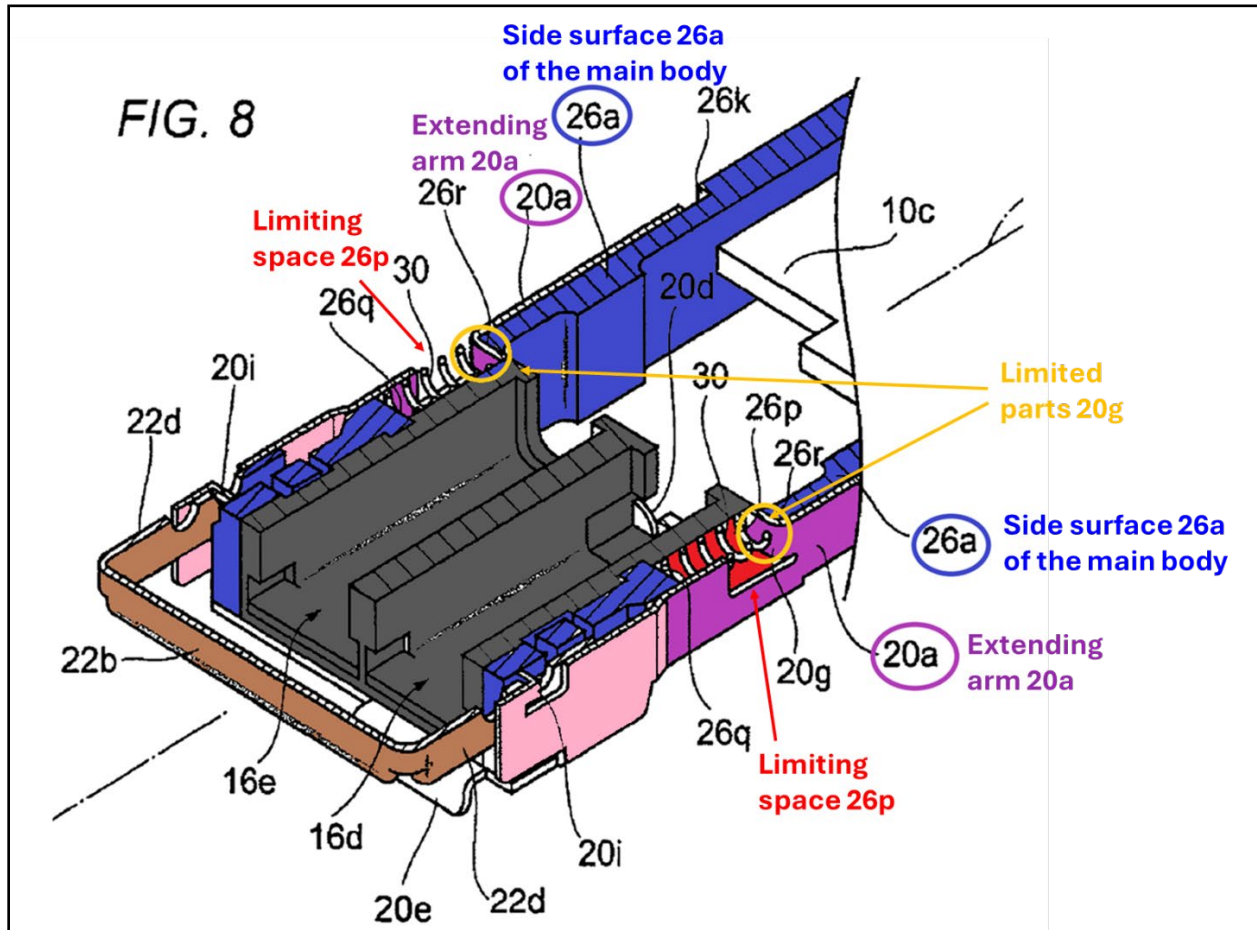
(forked slabs 20c) press apart the two first fastening parts (latches 4e) to make the two first fastening parts be farther away from each other. *Id.*

7. **Claim term 1[b][4] (“wherein each extending arm has a limited part configured to move in the at least one limiting space”)**

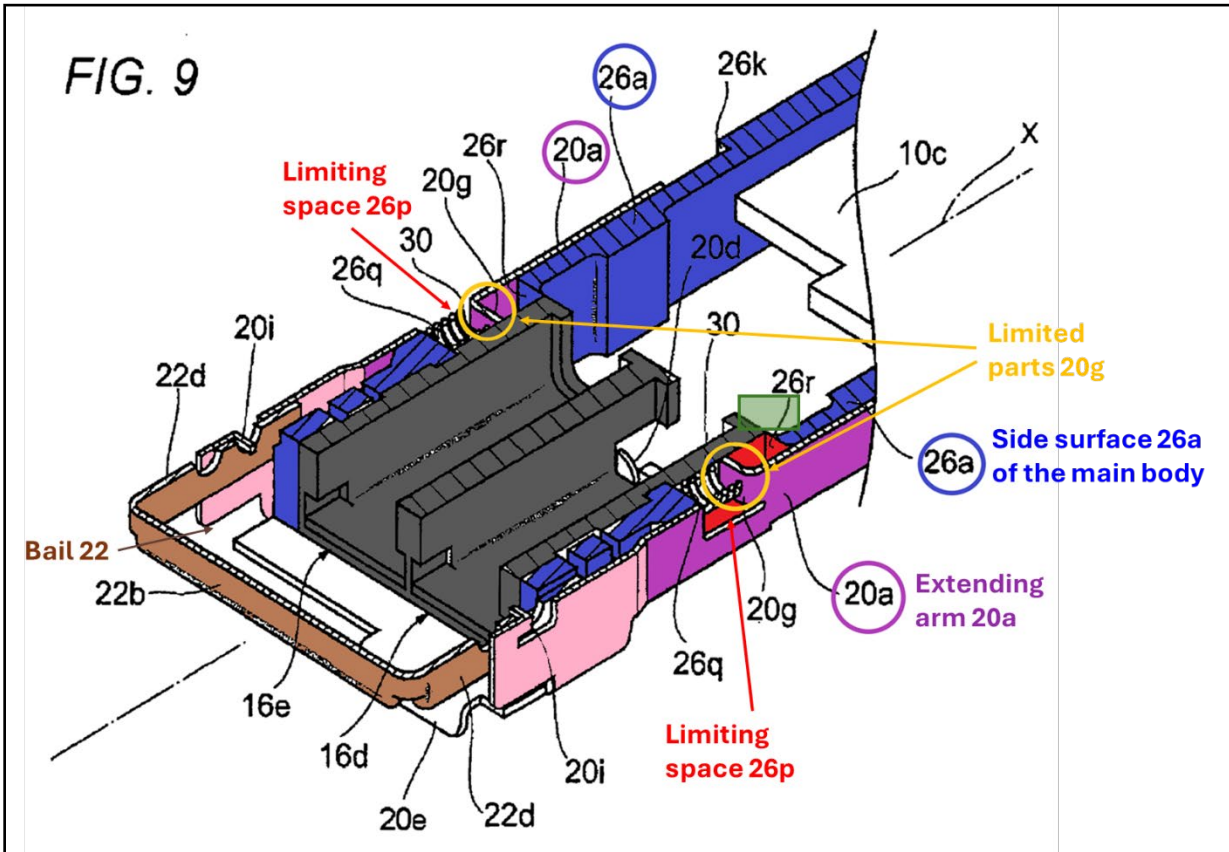
76. Each extending arm 20a has a flange 20g (limited part) that is configured to be inserted into groove 26p (limiting space). Ex. 1004, 7:27-35 (“**The actuator 20 further provides another flange 20g in the arm 20a.** The other flange 20g is cut from the arm 20a and bent inward such that the surface of the other flange 20g extends along a direction intersecting the axis X. On the other hand, **the side wall 26a of the upper body 26 further provides another groove 26p into which the other flange 20g of the actuator is inserted.** The other groove 26p has a pair of inner surfaces 26q and 26r, both extending in the direction intersecting the axis X.”). (emphases added).

77. Figures 8 and 9 of Mizue additionally show that flange 20g (limited part) is configured to move in groove 26p (limiting space). Ex. 1004, 7:38-51 (“FIG. 8 is a cross sectional view of the optical module 1a illustrated in perspective, and shows the state when actuator 20 is pushed therein. **The spring 30, in the ordinal position, presses the other flange 20g to touch the other surface 26r of the groove 26p[.]** ... FIG. 9 is also a partially cut perspective view showing the state that the actuator 20 is pulled out. **The spring is shrank by the flange 20g,** and the latch 4e of the

cage 4 is released from the projection 26i of the upper body 26.”) (emphases added),
Figs. 8 and 9.



Ex. 1004, Fig. 8 (showing **limited part (flange 20g)** in **limiting space (groove 26p)** when sliding component (actuator 20) is in the fastening position with the actuator pushed in)



Ex. 1004, Fig. 9 (showing **limited part (flange 20g)** moving in the **limiting space (groove 26p)** when sliding component (actuator 20) is pulled out and is in the releasing position)

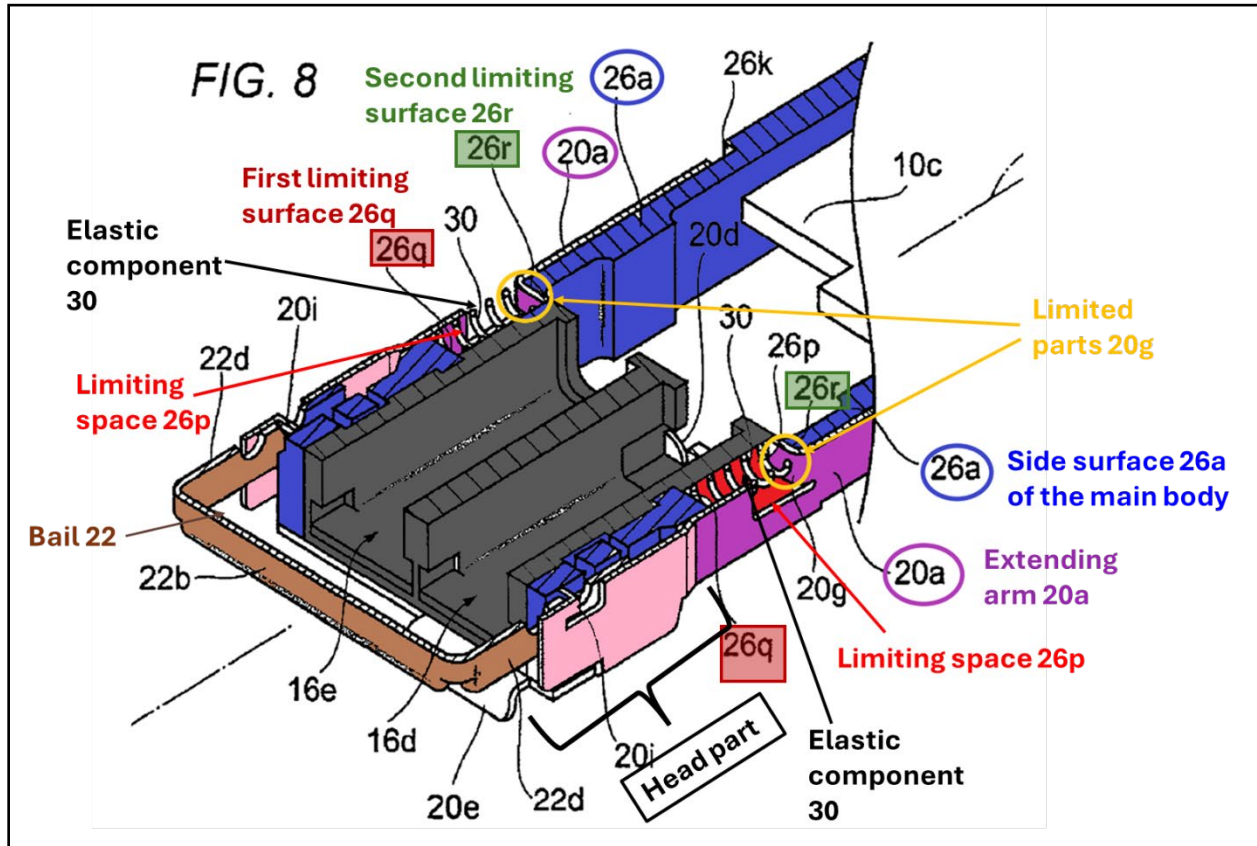
8. **Claim term 1[c]** (“an elastic component, wherein the main body has a first limiting surface and a second limiting surface forming the limiting space, the first limiting surface is closer to the head part than the second limiting surface, and the elastic component is located in the limiting space and between the first limiting surface and the limited part and is covered by the extending arm such that the elastic

component is confined by the main body and the sliding component.”)

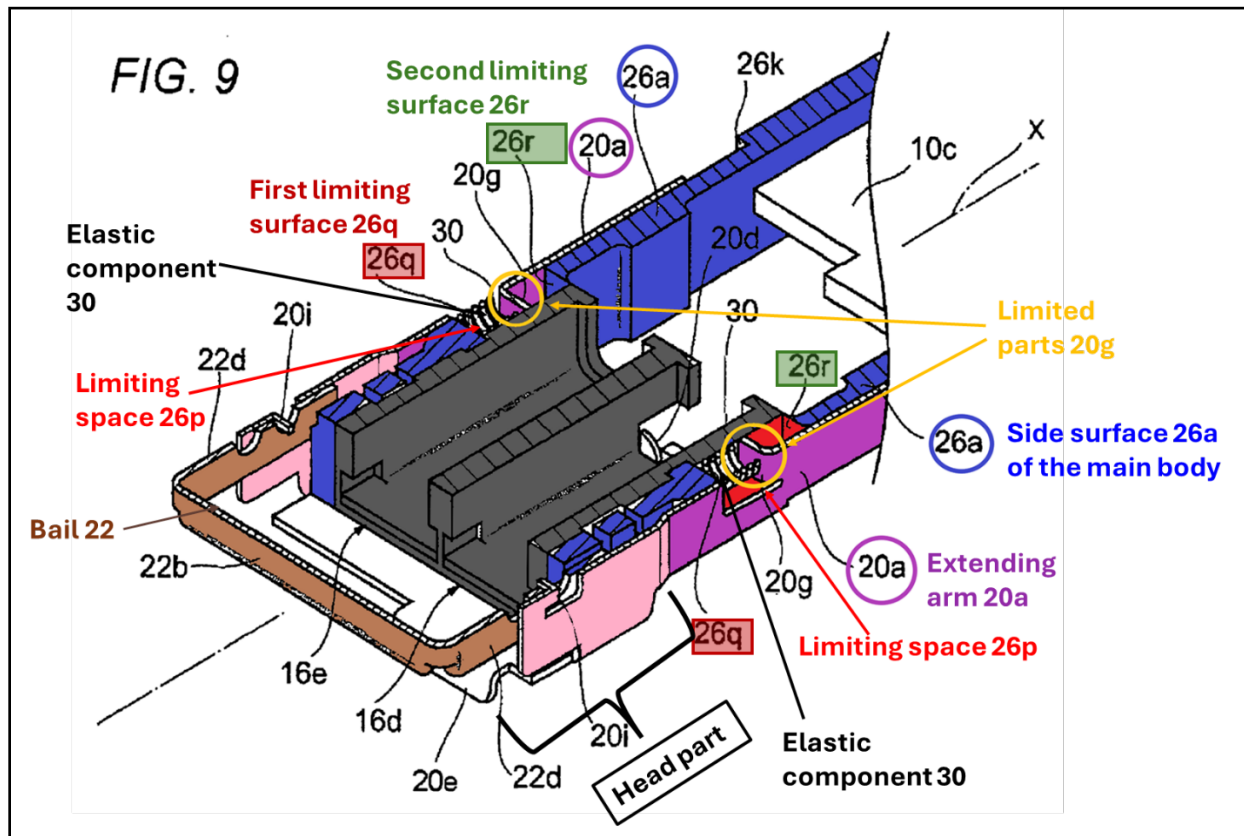
78. The optical module 1a of Mizue includes two elastic components (springs 30) that are housed in respective grooves 26p (limiting spaces) located on the side surfaces (sidewalls 26a) of main body 26. Ex. 1004, Fig. 7, 7:11-12 (“[T]he optical module 1a of the second embodiment includes a spring 30.”), 7:35-37 (“A spring 30 is inserted between the other flange 20g and one of the inner surface 26q of the groove 26p.”).

79. As shown in Figures 8 and 9, annotated below, each **limiting space 26p** of the main body is formed by a **first limiting surface 26q** and a **second limiting surface 26r**. Ex. 1004, Figs. 7, 8, 9 and 7:30-35 (“[T]he side wall 26a of the upper body 26 further provides another groove 26p into which the other flange 20g of the actuator is inserted. The other **groove 26p has a pair of inner surfaces 26q and 26r**, both extending in the direction intersecting the axis X.”) (emphasis added).

80. As further shown in Figures 8 and 9, annotated below, first limiting surface 26q is closer to the head part than the second limiting surface 26r, and each elastic component 30 is located between the first limiting surface 26q and the limited part (flange 20g). Ex. 1004, Figs. 8 and 9, 7:35-37 (“A spring 30 is inserted between the other flange 20g and one of the inner surface 26q of the groove 26p.”)



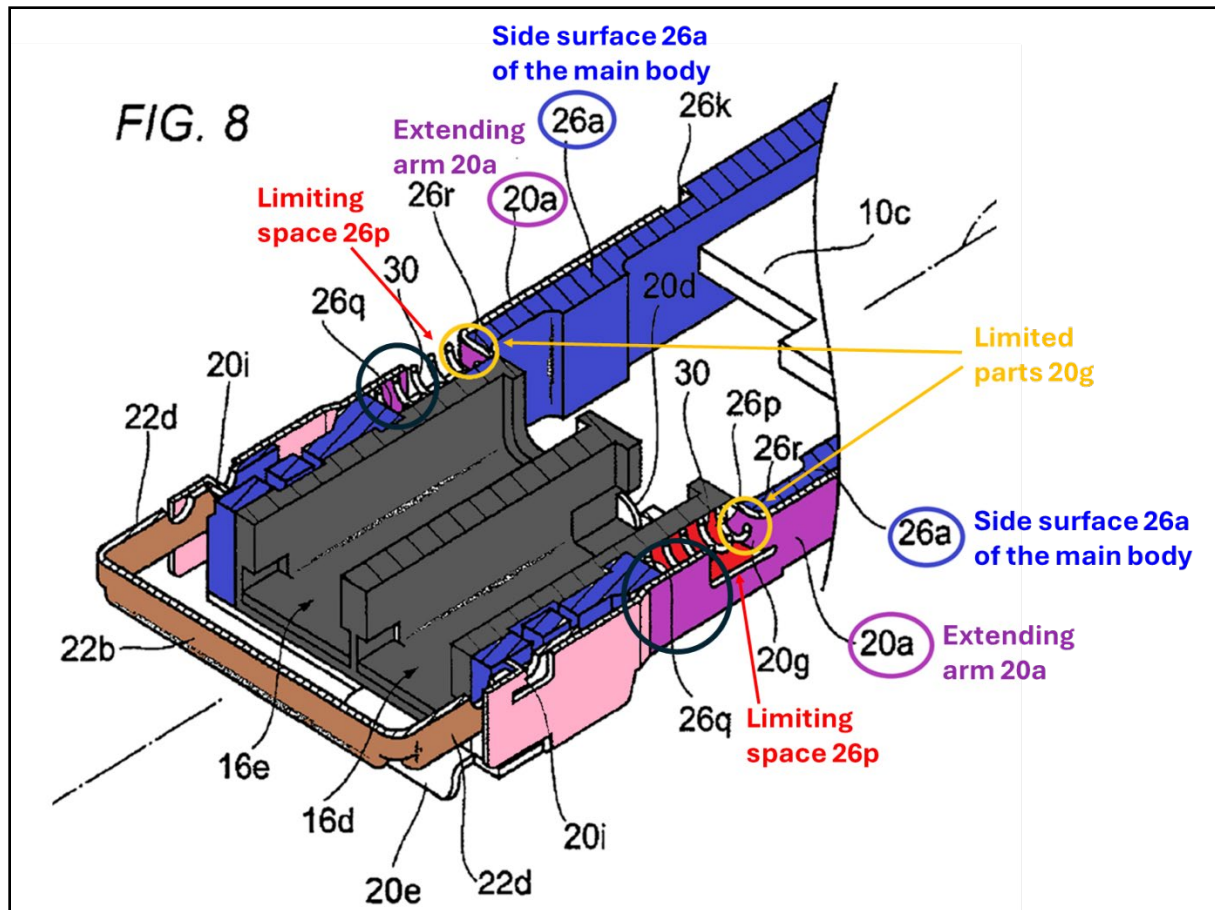
Ex. 1004, Fig. 8 (annotations added)



Ex. 1004, Fig. 9 (annotations added)

81. Furthermore, Figure 8 shows that each elastic component 30 is covered partially by extending arm 20a when the actuator is in the fastening position. Nowhere does claim 1 require the elastic component to be always covered fully by the arms of the sliding component. As such, each **elastic component 30** is confined, i.e., restricted or limited, by the **side surface 26a** of the main body 26 and the **extending arm 20a** of actuator 20 (sliding component) when optical module 1a is latched into cage 4. More specifically, each elastic component 30 is confined in all directions longitudinally (i.e., along the X axis) by side surface 26a of the main body

(i.e., on the sides and above and below limiting space $26p$) and laterally by extending arm $20a$ when installed. Ex. 1004, Fig. 8. That is, the elastic component is confined by the main body and the sliding component.



Ex. 1004, Fig. 8 (showing each elastic component 30 is covered by **extending arm 20a** and confined by the **side surface 26a** of the upper body 26 (main body) and the extending arm 20a of actuator 20 (sliding component))

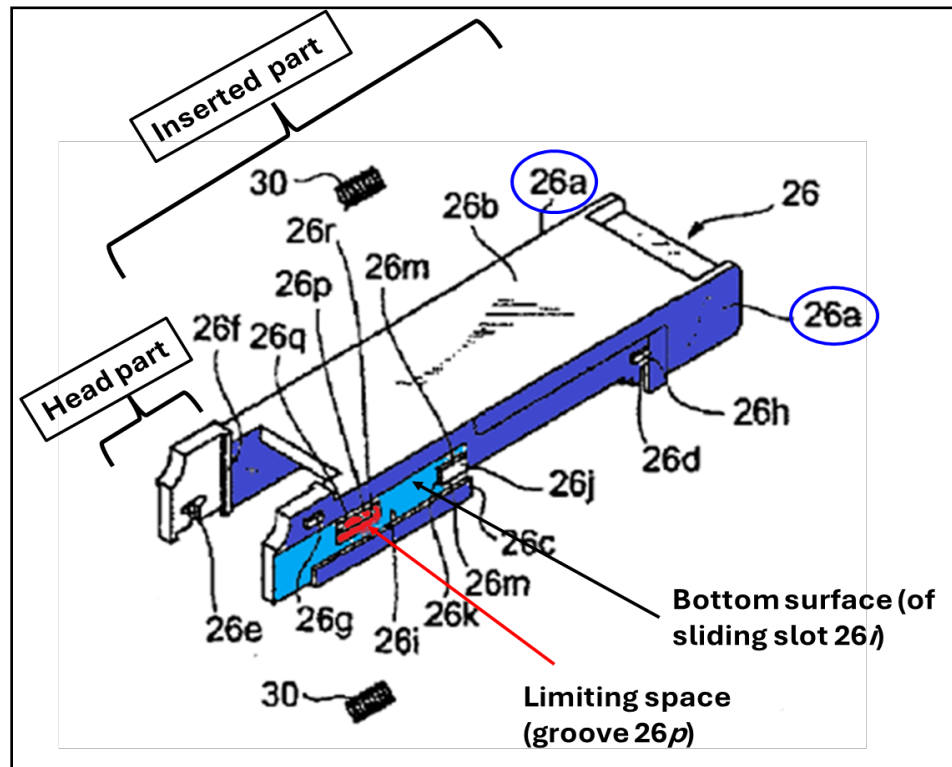
82. During prosecution of the '826 patent, Patent Owner incorrectly argued that Mizue does not disclose that “the elastic component is covered by the extending arm

such that the elastic component is confined by the main body and the sliding component” because “[e]ven if this structure in Mizue were combined with Togami, however, the spring 30 is exposed and not covered by the arm 20a. See Mizue, FIG. 9.” Ex. 1002, pp. 87-92. But as I explained above, Mizue indeed discloses that the elastic components (springs 30) are covered by the extending arms 20a and are confined by the main body and the arms. *See* Ex. 1004, Fig. 8. The examiner erred by not considering Mizue’s Figure 8.

- B. Claim 2 (“The pluggable optical transceiver module according to claim 1, wherein the main body comprises a head part and an inserted part connected to each other, the inserted part is configured to be inserted into the socket, the two side surfaces are located at two sides of the head part and the inserted part opposite to each other, respectively, wherein both the two sliding slots extend from the head part towards the inserted part, and the two extending arms are able to slide relative to the two sliding slots to have the fastening position which is farther away from the head part and the releasing position which is closer to the head part.”)**

83. As shown in Figure 7, below, the main body of Mizue’s optical module 1a comprises a head part and an inserted part connected to each other. As shown in Figure 1, and based on Mizue’s discussion of “hot-pluggable function,” a POSITA would have understood that the inserted part is configured to be inserted/plugged into the corresponding plugging slot of the socket (cage 4). Ex. 1004, Abstract (“[A]n optical module having a pluggable configuration, which enables to latch with

the cage” of a host device); *see also id.*, 1:8-9 (“This invention relates to an optical module, especially, an optical module having a hot-pluggable function”), 1:34-36.



Ex. 1004, Fig. 7 (excerpted to show only upper body 26 (main body) of optical module 1a; showing head part and inserted part of the main body and that the two **sliding slots 26i** on opposite side surfaces of the main body extend from the head part towards the inserted part)

84. As further shown in Figure 7, annotated above, two opposite **side surfaces 26a** are located at the sides of the head part and the inserted part, and the two **sliding slots 26i** extend from the head part towards the inserted part.

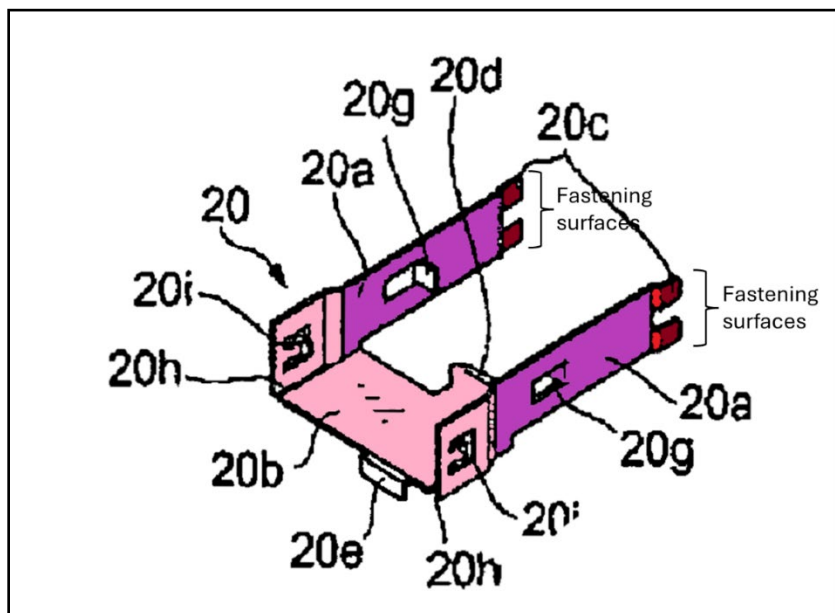
85. As discussed with regard to claim term 1[b][2], the extending arms 20*a* of actuator 20 are slidably disposed on the sliding slots (grooves 26*i*) of the main body (upper body 26) to have a fastening position and releasing position. Ex. 1004, 1:64-65 (“The housing may has [*sic*] a groove for receiving the arm of the actuator. The arm may slide in the groove.”), Figs. 7-9; *see also* Section VIII.A.5, above.

86. As discussed above in Section VIII.A.5, extending arms 20*a* of the sliding component slide along the sliding slot 26*i* to have a **fastening position** “when actuator 20 is pushed therein,” as shown in Figure 8, and a **releasing position** when “the actuator 20 is pulled out,” as shown in Figure 9. As Mizue explains, “FIG. 8 is a cross sectional view of the optical module 1*a* illustrated in perspective, and shows the state when **actuator 20 is pushed therein**. The spring 30, in the ordinal position, presses the other flange 20*g* to touch the other surface 26*r* of the groove 26*p*, and the flange 20*d*, provided in the center portion 20*b* of the actuator, is set **in the first [fastening] position**. ... FIG. 9 is also a partially cut perspective view showing the state that **the actuator 20 is pulled out**. The spring is shrank [*sic*] by the flange 20*g*, and the latch 4*e* of the cage 4 is released from the projection 26*i* of the upper body 26.” Ex. 1004, 7:38-54 (emphases added). Because the sliding component (actuator 20) is pulled back towards the head part to release/disengage the optical module from cage 4, the fastening position of the sliding component is farther away from the head

part compared to the releasing position (which is closer to the head part because the sliding component is pulled back to release it from the slot/socket).

C. Claim 3 (“The pluggable optical transceiver module according to claim 2, wherein each second fastening part has a fastening surface, and a distance between one side of the fastening surface which is close to the side surface and the head part is less than a distance between another side of the fastening surface which is far away from the side surface and the head part.”)

87. Mizue discloses that each forked slab 20c (second fastening part) has a fastening surface having two sides (shown in red and maroon). Ex. 1004, Fig. 7. Because each forked slab 20c is “bent toward the outer side of the optical module” (*id.*, 5:54-60, Fig. 7), **one side** (shown in red) is closer to the side surface 26a of the main body than **the other side** (shown in maroon). Moreover, a distance between the side closer to the side surface and the head part is less than a distance between the other side (that is farther away from the side surface) and the head part. Ex. 1004, 5:54-60, Fig. 7.



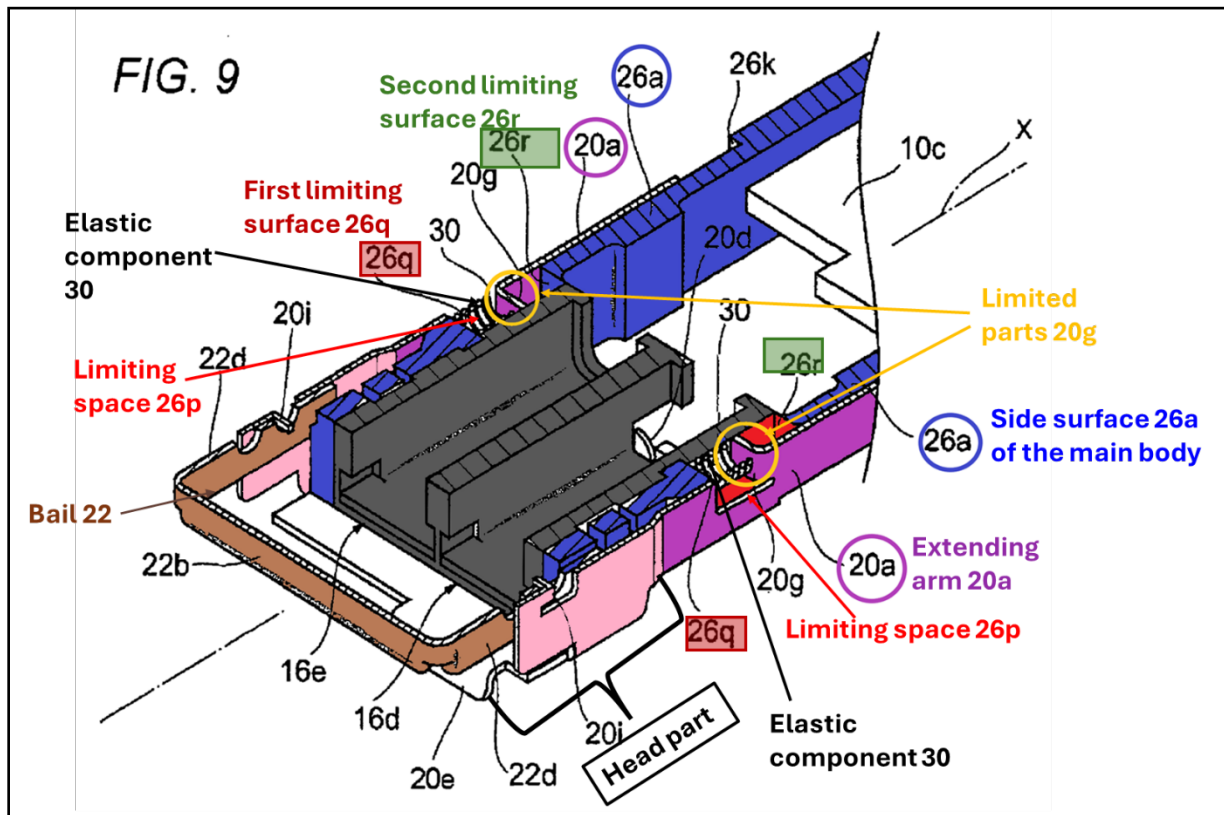
Ex. 1004, excerpt of Fig. 7 (showing that each second fastening part 20c has two surfaces: one closer to the side surface (of the main body) and the head part and another farther away from the side surface and the head part)

D. Claim 4 (“The pluggable optical transceiver module according to claim 2, wherein the head part has at least one optical fiber terminal.”)

88. As shown in Figures 8 and 9 of Mizue, the head part of optical module 1a houses receptacle body 16 having optical receptacles 16d and 16e, which are optical fiber terminals. Ex. 1004, Figs. 8, 9. Terminals 16d and 16e receive an optical connector 24. *Id.*, Fig. 7.

- E. Claim 5 (“The pluggable optical transceiver module according to claim 1, further comprising two elastic components, wherein the number of the at least one limiting surface is two, the main body has two first limiting surfaces and two second limiting surfaces forming the two limiting spaces together, respectively, the two first limiting surfaces are closer to the head part than the two second limiting surfaces, the two elastic components are located in the two limiting spaces, respectively, and each elastic component is between the first limiting surface and the limited part.”)**

89. As discussed with regard to claim term 1[c] (Section VIII.A.8), Mizue discloses an elastic component 30 disposed in a limiting space 26p between a first limiting surface 26q and a limited part 20g. As shown in Figures 7-9 of Mizue, there are two limiting spaces 26p—one on each of the two side surfaces of the optical module—and there are two elastic components 30, each disposed in a respective limiting space 26p on each side of the module, between a respective limited part 20g and a first limiting surface 26q. Ex. 1004, Figs. 7-9. A POSITA would also have understood that each limiting space 26p is formed by a first limiting surface 26q and a second limiting surface 26r, as shown below. That is, there are two first limiting surfaces and two second limiting surfaces, with the two first limiting surfaces being closer to the head part than the two second limiting surfaces. *See* Section VIII.A.8, above.



Ex. 1004, Fig. 9 (annotations added)

F. Claim 6 (“The pluggable optical transceiver module according to claim 1, wherein the pluggable optical transceiver module further comprises a pull handle pivoted on the linkage arm of the sliding component.”)

90. Mizue’s optical module 1a includes a pull handle (bail 22) that is pivoted on the linkage arm (20b and 20h) of the sliding component (actuator 20). Ex. 1004, 7:63-67, Figs. 7-9. Specifically, bail 22 is pivoted “by the projection 20i [in the linkage arm] being inserted in the hole 22e in the arm 22d” of the bail. *Id.*, 7:20-26. “[W]hen the actuator 20 is in the first position at which the optical module 1a is

latched to the cage 4, the bail 22 is set in one of the upward and the downward position relative to the optical module 1 *a*.” *Id.*, 7:66-67.

G. Independent claim 7

91. Mizue discloses each and every limitation of claim 7.

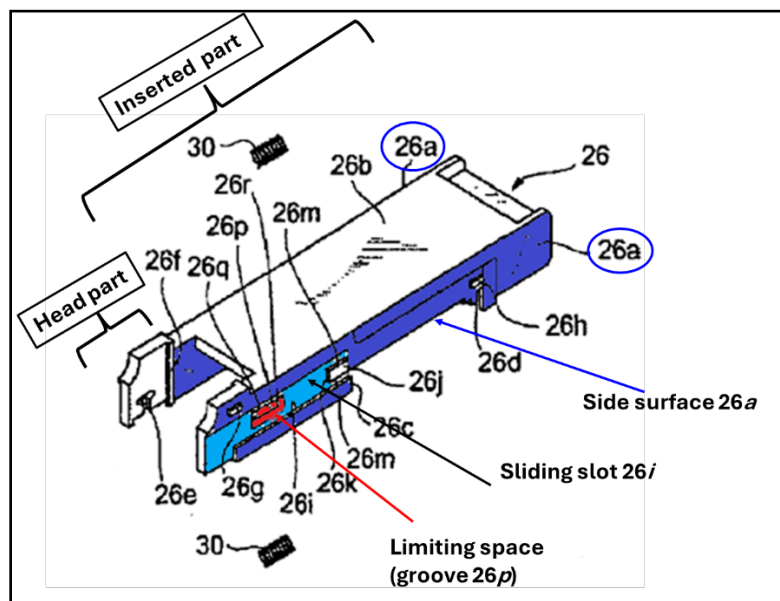
1. 7[preamble] (“A pluggable optical transceiver module, comprising:”)

92. As discussed with regard to claim 1, Mizue discloses a pluggable optical transceiver module. *See* Section VIII.A.1, above. Specifically, Mizue discloses an optical module 1 (and versions 1*a*, 1*b* thereof) that are plugged into a cage 4 (socket) installed on a host board 2. *Id.* As further discussed with regard to claim 1, a POSITA would have readily envisaged from Mizue’s disclosure that optical module 1*a* plugs into cage 4 in the same manner as optical module 1. *Id.*

2. Claim term 7[a][1] (“a main body having a head part and an inserted part that are connected to each other, wherein the main body further comprises opposite two side surfaces and two sliding slots which are located at two sides of the head part and the inserted part opposite to each other, respectively, the two sliding slots are located at the two side surfaces, and the two sliding slots extend from the head part to the inserted part, respectively”)

93. As discussed with regard to claim term 1[a][1], Mizue’s optical module 1*a* (pluggable optical transceiver module) has an upper body 26 that serves as the main body of the optical module. Section VIII.A.2, above. As shown in annotated Figure 7, below, upper body 26 (main body) has a head part and an inserted part that are

connected to each other. *See also* Section VIII.A.2, above. Main body 26 has two side surfaces (sidewalls 26a) that are opposite each other. *Id.*; Ex 1004, Fig. 7. Each side surface has a sliding slot (groove 26i) located thereon. Section VIII.A.2, above. As Figure 7 shows, the two sliding slots 26i are located at two sides of the head part and the inserted part opposite each other. *Id.* Furthermore, the two sliding slots are located at the two side surfaces 26a, and the two sliding slots extend from the head part to the inserted part. *Id.*

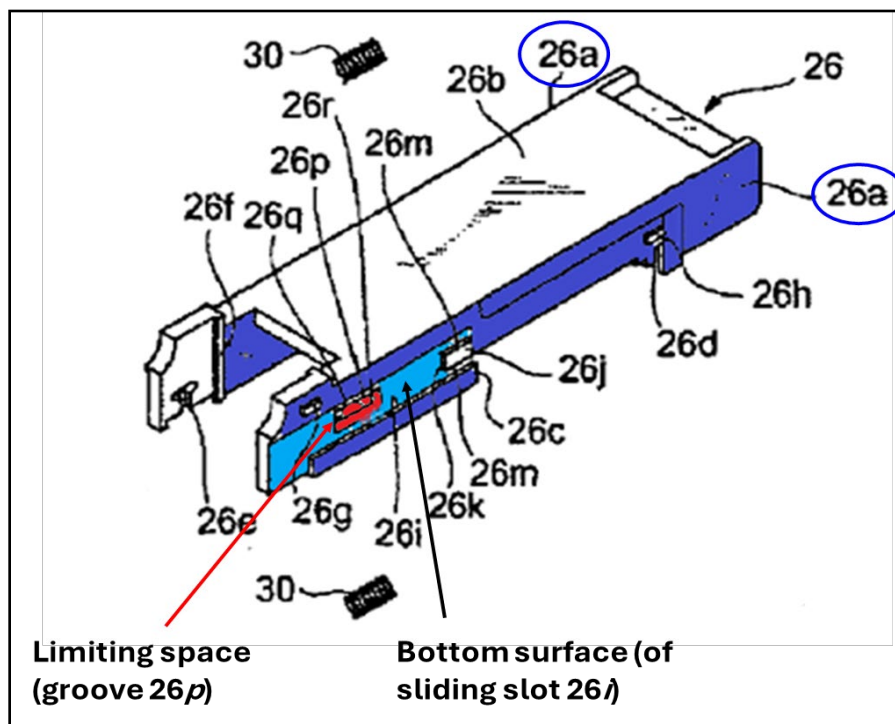


Ex. 1004, excerpt of Fig. 7 (showing main body 26 having two opposite **side surfaces 26a** and a **sliding slot 26i** extending from the head part to the inserted part on each side surface)

3. **Claim term 7[a][2]** (“wherein the main body has at least one limiting space and two bottom surfaces forming the two sliding slots, respectively, the two bottom surfaces are

parallel to the two side surfaces, the at least one limiting space is located at one of the two side surfaces”)

94. Claim term 7[a][2] is same as claim term 1[a][2]. The main body (upper body 26) includes two **grooves 26p (limiting spaces)**, each formed within a **groove 26i (sliding slot)** of each **side surface (sidewall 26a)**. Ex. 1004, Fig. 7; *see* Section VIII.A.3, above. Furthermore, each sliding slot 26i has a bottom surface that forms the sliding slot; the two bottom surfaces of the two sliding slots are parallel to the side surfaces 26a; and a limiting space 26p is located in a respective side surface. Section VIII.A.3, above.

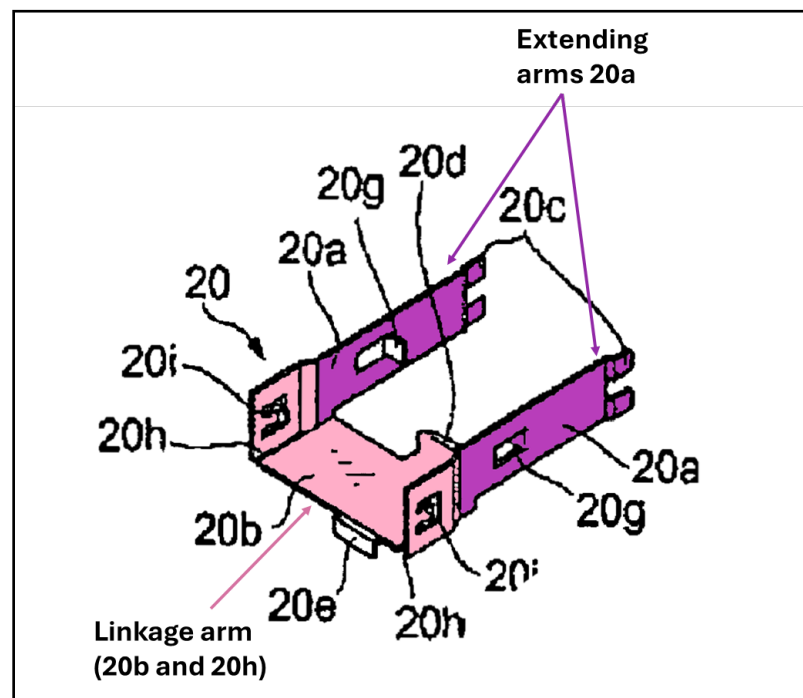


Ex. 1004, excerpt of Fig. 7 (annotations added)

4. Claim term 7[b][1] (“a sliding component comprising a linkage arm and two extending arms, wherein the linkage

arm is connected between the two extending arms, each extending arm has a second fastening part, the main body is between the two extending arms,")

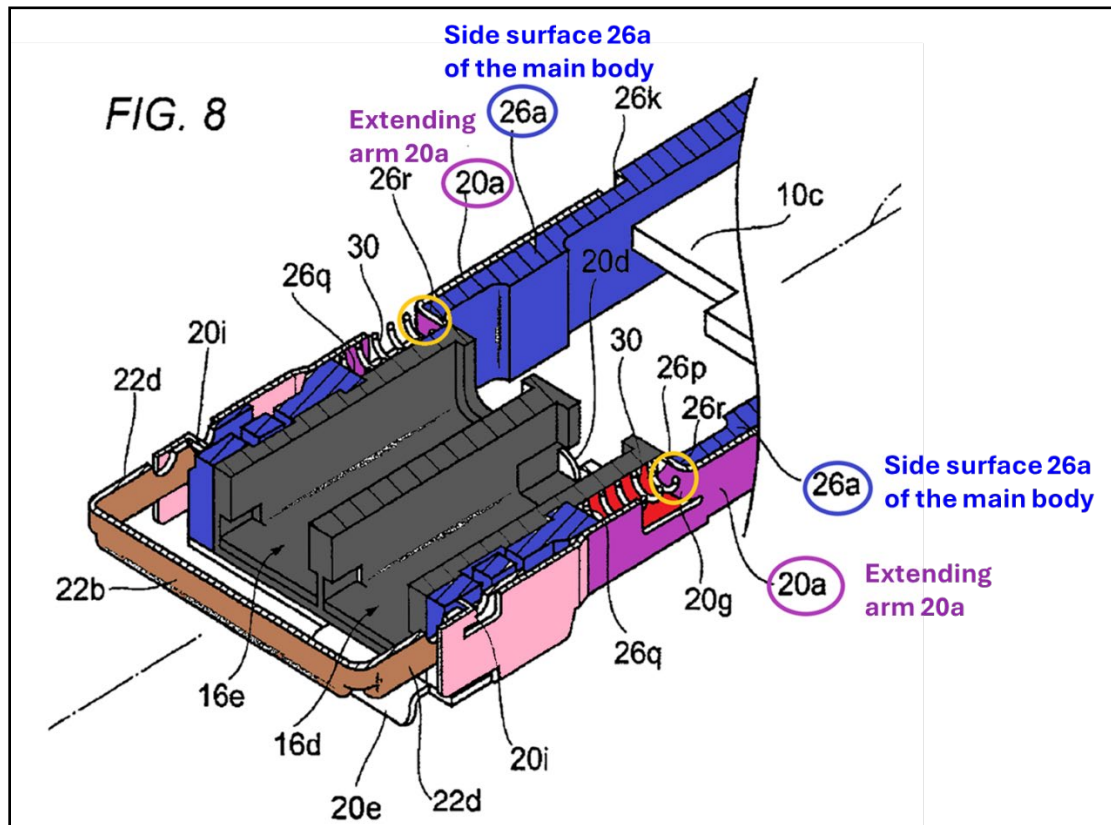
95. As discussed with regard to claim term 1[b][1], optical module 1*a* includes an actuator 20 (sliding component) comprising two extending arms 20*a* and a linkage arm formed by a center portion 20*b* and front side walls 20*h*, and wherein the linkage arm is connected between the two extending arms. Ex. 1004, Fig. 7, 7:16-19; Section VIII.A.4, above.



Ex. 1004, excerpt of Fig. 7 (annotated to show **extending arms** and **linkage arm** of actuator 20)

96. Furthermore, each extending arm 20*a* has a second fastening part (forked slab 20*c*) at the tip of the arm. Ex. 1004, Fig. 7, 5:54-60; *see also* Section VIII.A.4, above.

As further shown in Figures 8 and 9 of Mizue, the main body (upper body 26) is disposed between extending arms 20a of actuator 20. *See* Section VIII.A.4, above.



Ex. 1004, Fig. 8 (showing **main body (upper body 26)** is disposed between **extending arms 20a** of actuator 20)

5. **Claim term 7[b][2] (“the two extending arms are able to slide relative to the two sliding slots to have a fastening position which is farther away from the head part and a releasing position which is closer to the head part,”)**

97. As discussed with claim term 1[b][2], the extending arms 20a of actuator 20 are slidably disposed on the sliding slots (grooves 26i) of the main body (upper body 26) to have a fastening position (when actuator 20 is pushed in) and a releasing

position (when actuator 20 is pulled out). *See* Section VIII.A.5, above; Ex. 1004, Figs. 8 and 9 (showing the fastening and releasing positions of the extending arms 20a, respectively). As further discussed with regard to claim 2, because the sliding component (actuator 20) is pulled back towards the head part to release/disengage the optical module from cage 4, the fastening position is farther away from the head part compared to the releasing position (which is closer to the head part because the sliding component is pulled back to release it from the slot/socket). *See* Sections VIII.A.5 and VIII.B, above.

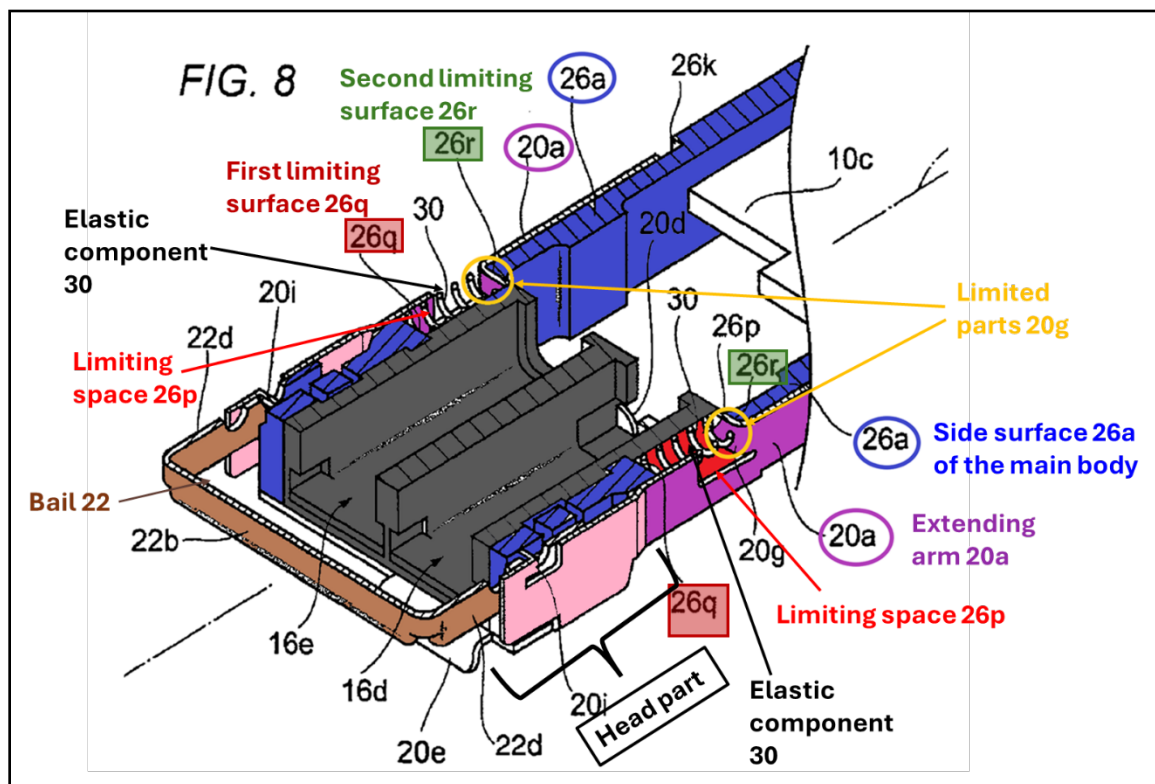
6. Claim term 7[b][3] (“wherein each extending arm has a limited part configured to move in the at least one limiting space;”)

98. Claim term 7[b][3] is same as claim term 1[b][4]. As discussed with regard to claim term 1[b][4], each extending arm 20a has a flange 20g (limited part) that is configured to move in a respective groove 26p (limiting space) when actuator 20 (sliding slot) goes from the fastening to the releasing position. *See* Section VIII.A.7, above.

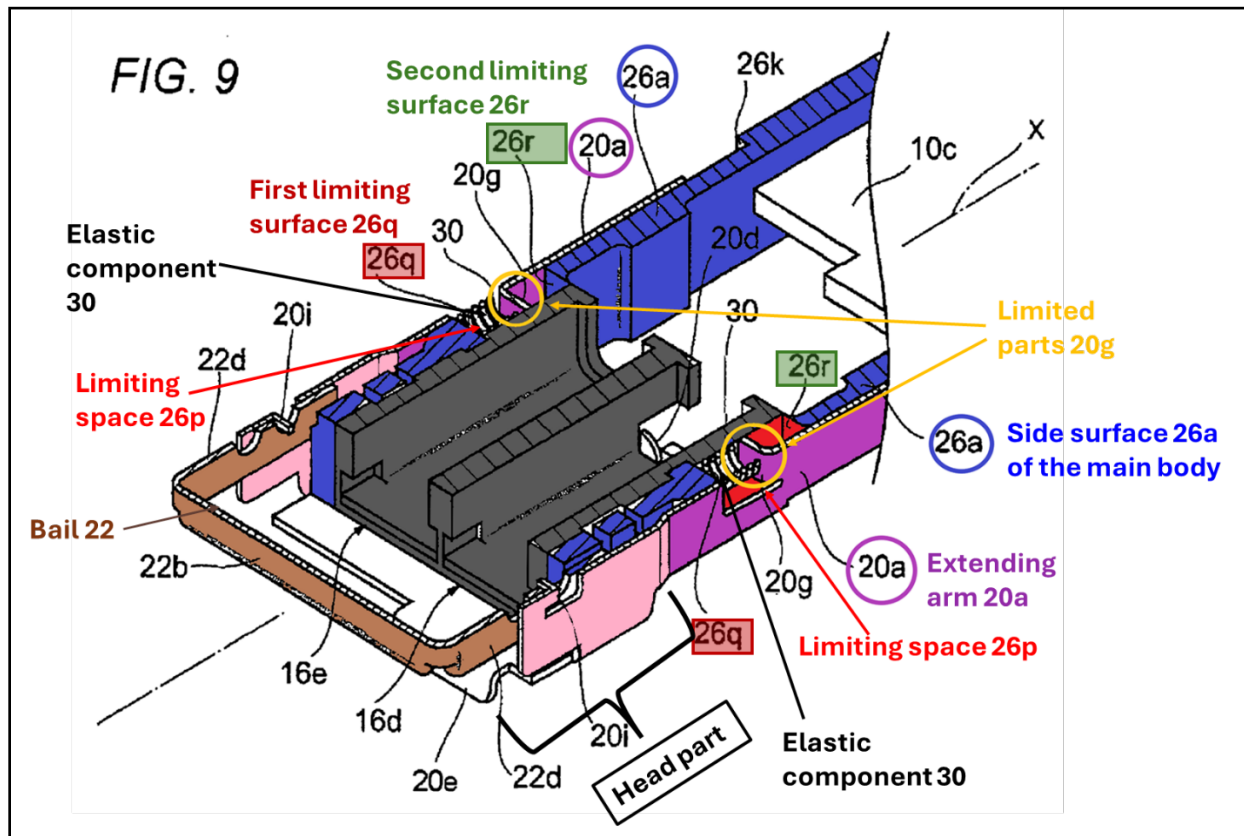
7. Claim term 7[c] (“an elastic component, wherein the main body has a first limiting surface and a second limiting surface forming the limiting space, the first limiting surface is closer to the head part than the second limiting surface, and the elastic component is located in the limiting space and between the first limiting surface and the limited part and is covered by the extending arm such that the elastic

component is confined by the main body and the sliding component.”)

99. Claim term 7[c] is same as claim term 1[c]. As discussed with regard to claim term 1[c], optical module 1*a* of Mizue includes two elastic components (springs 30) that are housed in respective grooves 26*p* (limiting spaces) formed by a pair of limiting surfaces 26*q* and 26*r*. *See* Section VIII.A.8, above. As further shown in Figures 8 and 9, annotated below, first limiting surface 26*q* is closer to the head part than the second limiting surface 26*r*, and each elastic component 30 is located between the first limiting surface 26*q* and the limited part (flange 20*g*). *See id.*



Ex. 1004, Fig. 8 (annotations added)



Ex. 1004, Fig. 9 (annotations added)

100. Furthermore, Figure 8 shows that each elastic component 30 is covered partially by extending arm 20a when the actuator is in the fastening position. *See* Section VIII.A.8, above. As such, each elastic component 30 is confined, i.e., restricted or limited, in all directions along the X-axis by the side surface 26a of the main body 26 and by the extending arm 20a of actuator 20 in a direction perpendicular to the X-axis when optical module 1a is latched into cage 4. *See* Section VIII.A.8, above.

IX. [GROUND 2] CLAIMS 1-6 ARE RENDERED OBVIOUS BY LI IN VIEW OF LIU

A. A POSITA would have been motivated to combine the teachings of Li and Liu with a reasonable expectation of success

101. Li and Liu are both in the same field of QSFP module interface devices, and therefore, a POSITA would have considered them together when designing or developing a pluggable transceiver module for hot-plugging into a host device. The QSFP module interface devices of Li and Liu have similar structures, each having a sliding component with two extending arms that slide along grooves provided on the sidewalls of the main housing. Ex. 1005, ¶[0022]; Ex. 1006, ¶¶[0017], [0019]. Both QSFP module interface devices also include similar locking mechanisms, each having fastening components on the extending arms that engage with corresponding fastening components on a plugging socket. Ex. 1005, ¶¶[0023], [0028], Fig. 3; Ex. 1006, ¶¶[0017], [0019], [0020], Fig. 1. Moreover, the QSFP module interface devices of Li and Liu include resetting mechanisms comprising spring devices that reset the QSFP module interface device after it is unlocked from the plugging socket. Ex. 1005, ¶[0027]; Ex. 1006, ¶[0019].

102. Given the similarities between Li's and Liu's QSFP module interface devices, a POSITA would have readily understood the design compatibility between them, and thus would have been motivated to consider them together to design an improved hot-pluggable transceiver module that is practical, durable, has an

effective and reliable locking/unlocking mechanism, and “has a simple structure and is easy to assemble, compact in size, lightweight, reliable in operation, and capable of conveniently and effectively achieving hot plugging.” Ex. 1005, ¶[0029]; *see also* Ex. 1006, ¶¶[0004], [0005], [0007] (discussing improvement in the locking mechanism and being “structurally stable” and “easy to plug and unplug”), Abstract (discussing that the disclosed design provides a “simpler structure” and “enable[s] quick plugging and unplugging operations with reliable and stable performance and strong practicality.”). Because of the similarities in design, purpose, and functionality between Li’s and Liu’s QSFP modules, a POSITA would also have reasonably expected success in using the teachings of Li and Liu together. Combining Li and Liu would have required nothing more than the basic knowledge and skills of a POSITA, and a POSITA would have been able to make the combination with little to no experimentation.

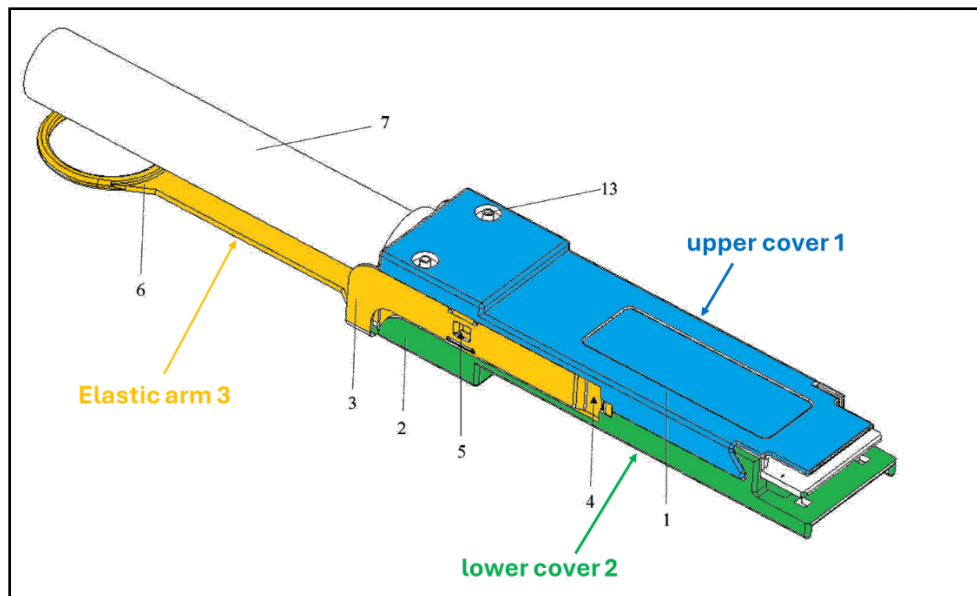
B. Independent claim 1

103. Li in view of Liu discloses, teaches, or suggests each and every limitation of claim 1.

1. **1[preamble] (“A pluggable optical transceiver module, for being inserted into a plugging slot of a socket, the socket**

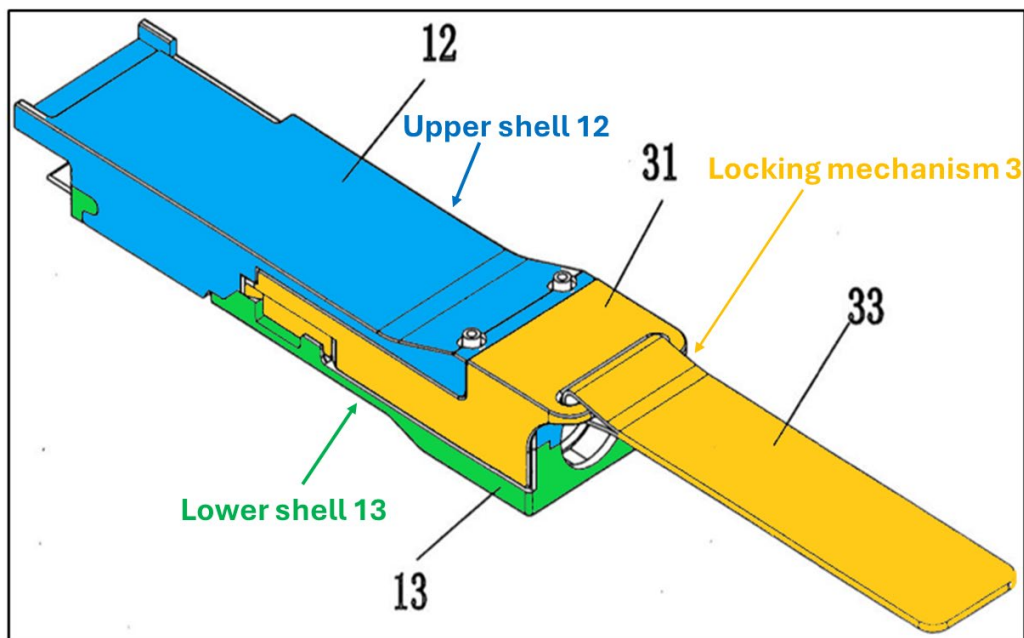
comprising two first fastening parts located in the plugging slot, the pluggable optical transceiver module comprising:”)

104. Li discloses a QSFP module interface device (a “pluggable optical transceiver module”) capable of hot plugging. Ex. 1005, Abstract, ¶¶[0002], [0003], Fig. 1. Additionally, Li discloses that the module is capable of plugging into a slot module (“socket”) having a plugging slot/space, which contains elastic pieces (“first fastening parts”) connected to the slot module that allow the QSFP module interface device to be smoothly plugged in and out of the slot module. *Id.*, ¶[0023] (discussing “an elastic piece connected to a slot module (not shown) of the QSFP module interface device, allowing the QSFP module interface device to be smoothly unplugged.”).



Ex. 1005, Fig. 1 (showing a QSFP module interface comprising, among other parts, an **upper cover 1**, a **lower cover 2**, and an **elastic arm 3**)

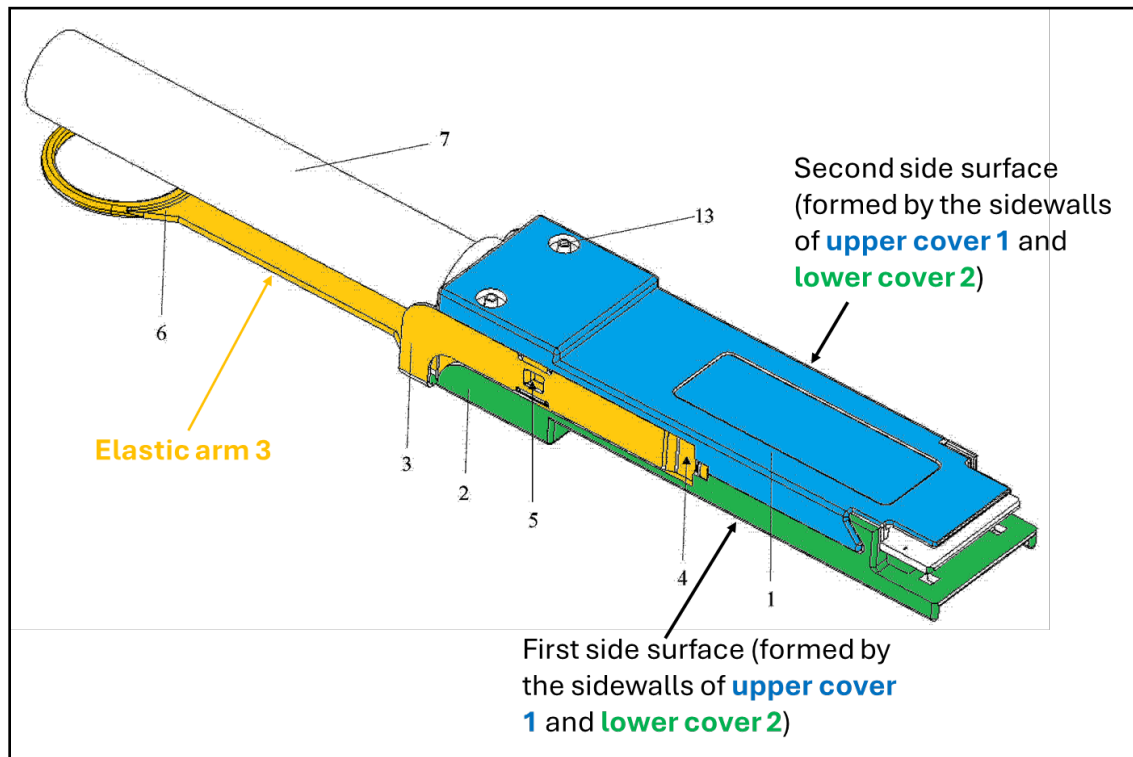
105. Similarly, Liu discloses a QSFP module interface structure (a “pluggable optical transceiver module”) that includes “a simpler structure to make plugging and unplugging operations more convenient and enable quick plugging and unplugging operations with reliable and stable performance and strong practicality.” Ex. 1006, Abstract, ¶[0002], ¶[0006], Figs. 1 and 4. Additionally, Liu discloses that the module is capable of plugging into a socket, which contains pre-configured locking members (“first fastening parts”) that engage with features on the QSFP interface module device and enable the QSFP module interface device to be smoothly plugged in and out of the socket. *Id.*, ¶[0020].



Ex. 1006, Fig. 4 (showing a QSFP module interface device formed by an **upper shell 12** and a **lower shell 13**, and comprising a **locking mechanism 3**)

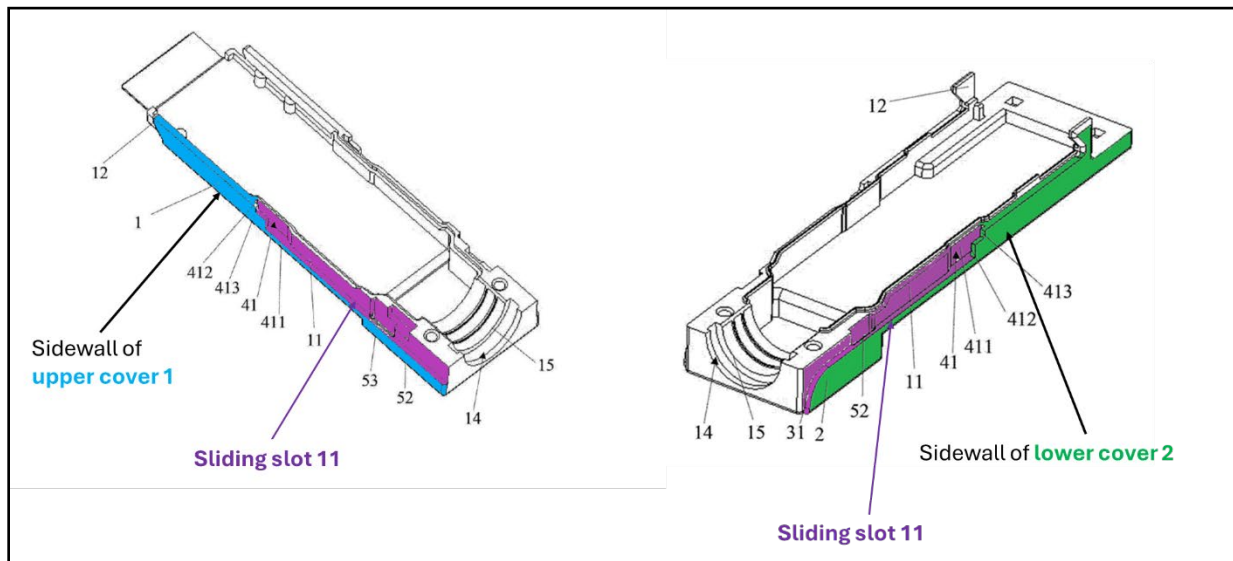
- 2. Claim term 1[a][1] (“a main body having two side surfaces that are opposite to each other and two sliding slots located at the two side surfaces, respectively, wherein the main body is configured to be inserted into the plugging slot”)**

106. Li discloses a QSFP module interface device “including: an upper cover 1, a lower cover 2, and elastic arms 3.” Ex. 1005, ¶[0022]. The upper cover 1 and lower cover 2 together form the main body of the QSFP module interface device. *Id.* “Two opposite sides of the upper cover 1 are connected to the lower cover 2 at connecting positions, and the connecting positions have first recess portions 11 recessed thereon.” *Id.*; *see also id.*, Figs. 1, 4, 5. As shown in Figure 1 (annotated below), the main body includes two side surfaces, wherein each side surface is formed by a sidewall of upper cover 1 and a sidewall of lower cover 2 that interlock with each other. As a POSITA would have understood, the two side surfaces would be opposite to each other.



Ex. 1005, Fig. 1 (showing the main body having two side surfaces that are opposite to each other)

107. Each side surface of Li's QSFP module interface device further includes a sliding slot formed by first recess portion 11 on the sidewalls of upper cover 1 and lower cover 2. Ex. 1005, ¶[0022]. That is, the QSFP module interface device includes two sliding slots, one on each side surface of the main body, and each slot is formed by first recess portion 11. *Id.* "The elastic arm 3 is engaged with the first recess portion 11 and capable of **sliding along a track formed by the first recess portion 11.**" *Id.* (emphasis added); *see also id.* Figs. 4, 5.



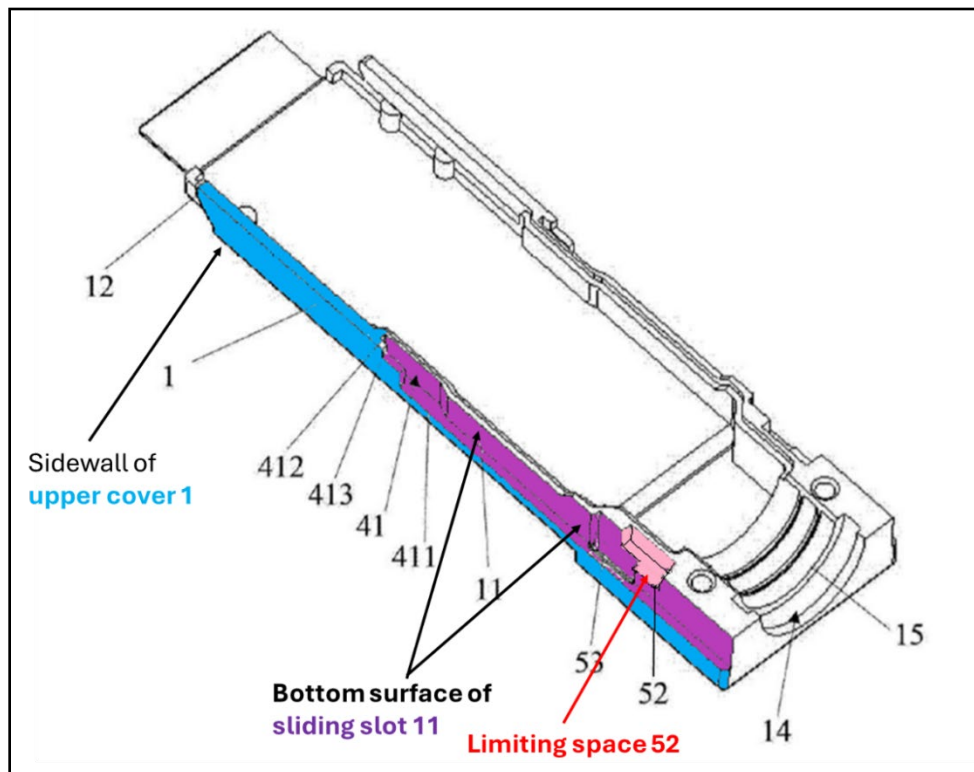
Ex. 1005, Figs. 4 and 5 (showing a **sliding slot** (formed by recess portion 11) on side surfaces of the **upper cover 1** and the **lower cover 2**, which are connected to form the main body)

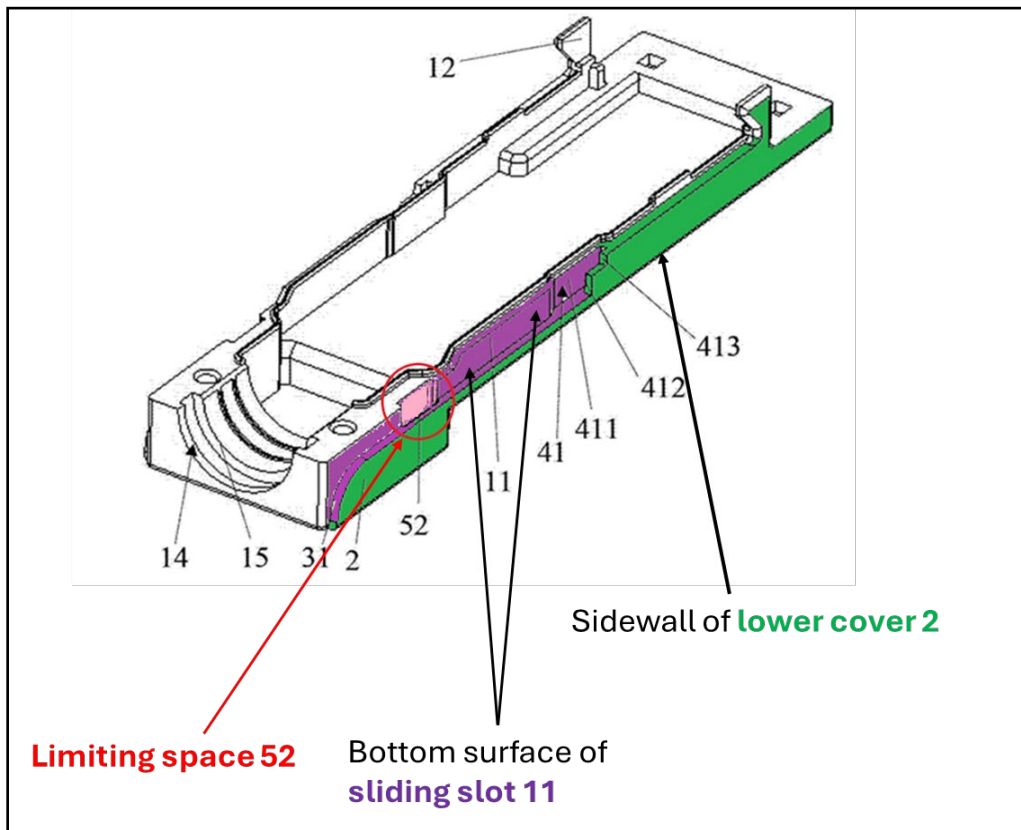
108. Li's QSFP module interface device is described as capable of "hot plugging." Ex. 1005, Abstract, ¶¶[0002], [0003]. Additionally, Li discloses that the QSFP module is configured to plug into a slot module (socket). *Id.*, ¶[0023]. It would have been obvious to a POSITA that at least a portion of the main body of the QSFP module interface device is configured to be inserted into the plugging slot of the socket. *Id.*, Abstract, ¶¶[0002], [0023], [0029].

3. **Claim term 1[a][2] ("wherein the main body has at least one limiting space and two bottom surfaces forming the two sliding slots, respectively, the two bottom surfaces are**

parallel to the two side surfaces, the at least one limiting space is located at one of the two side surfaces”)

109. Each sliding slot (first recess portion 11) on each side surface of Li's QSFP module interface device includes a bottom surface and a limiting space (third recess portion 52) that together form the sliding slot. Ex. 1005, ¶[0025] (discussing that “a third recess portion 52 [is] recessed within the first recess portion 11”), Figs. 4 and 5. As shown in Figures 4 and 5, annotated below, the bottom surface of each sliding slot is parallel to the adjacent side surface, and the each third recess portion 52 (limiting space) is located at a side surface.



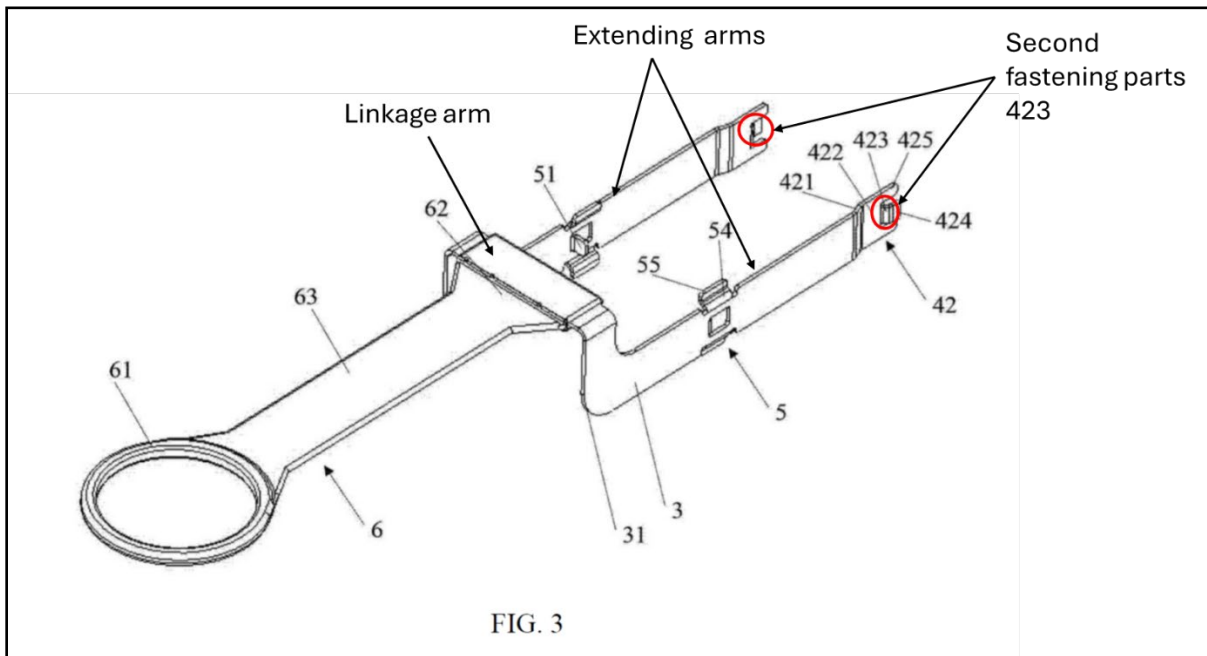


Ex. 1005, Figs. 4 and 5 (showing that the bottom surface of each **sliding slot 11** is parallel to the adjacent side surface, and that each **limiting space 52** is located at a side surface)

4. **Claim term 1[b][1] (“a sliding component comprising a linkage arm and two extending arms, wherein the two extending arms are connected to two ends of the linkage arm, respectively, each extending arm has a second fastening part, the main body is between the two extending arms”)**

110. Li’s QSFP module interface device includes an elastic arm 3 (“sliding component”) comprising a linkage arm and two extending arms. Ex. 1005, Figs. 1-3. As shown in Figure 3, annotated below, two ends of the linkage arm are connected

to the two extending arms, such that the linkage arm is disposed between the two extending arms. *See also id.*, Figs. 1 and 2.

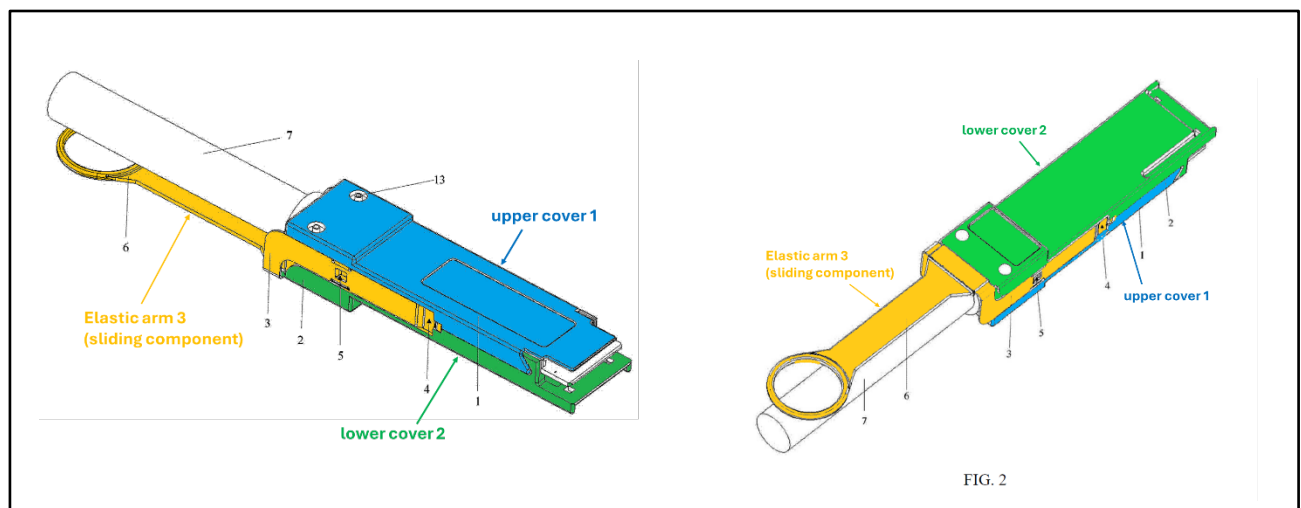


Ex. 1005, Fig. 3 (showing Li's sliding component (elastic arm 3) having two extending arms and a linkage arm, and a fastening part (part 423 of protrusion 42) provided at the end of each extending arm)

111. Each extending arm of the sliding component (elastic arm 3) includes a protrusion 42 provided at the end that is farthest away from the linkage arm. Ex. 1005, Fig. 3. Li further describes that “protrusion 42 [is] disposed on the elastic arm 3, and the **second recess portion 41 [provided on the sliding slot] and the protrusion 42 engage with each other. The protrusion 42 is provided at the end of the elastic arm 3 and includes a first bent portion 421, a parallel portion 422**

connected to the first bent portion 421 and parallel to the elastic arm 3, a **second bent portion 423 connected to the parallel portion 422**, a push block 424 connected to the second bent portion 423, and a push claw 425 connected to the parallel portion 422. The push claw 425 and the second bent portion 423 are arranged in parallel at one end of the parallel portion 422.” *Id.*, ¶[0023] (emphases added). Li further discloses that at least each **second bent portion 423** (“second fastening part”) engages with an elastic part on the slot module to lock the QSFP module interface device to the slot. *See id.*

112. As shown in Figures 1 and 2 of Li, the main body (formed by upper cover 1 and lower cover 2) is disposed between the two extending arms of the sliding component (elastic arm 3).



Ex. 1003, Figs. 1 and 2 (showing that the main body of Li’s QSFP module interface device is disposed between the two extending arms of sliding component 3)

5. Claim term 1[b][2] (“the two extending arms are slidably disposed on the two sliding slots to have a fastening position and releasing position”)

113. Li discloses that each extending arm of the sliding component (elastic arm 3) is slidably disposed on a sliding slot (formed by first recess portion 11) provided on a side surface of the main body of Li’s QSFP module interface device. Ex. 1005, ¶[0022] (“Two opposite sides of the upper cover 1 are connected to the lower cover 2 at connecting positions, and the connecting positions have first recess portions 11 recessed thereon. **The elastic arm 3 is engaged with the first recess portion 11 and capable of sliding along a track formed by the first recess portion 11.**”) (emphasis added), Figs. 1 and 2.

114. The extending arms of the sliding component (elastic arm 3) slide along the sliding slot to have a **fastening position when the protrusions 42 of the extending arms are engaged with the first recess portions 41** provided on the sliding slots (formed by recess portions 11) on the sides of the main body. Ex. 1005, ¶[0023]. Specifically, Li’s QSFP module interface device includes an unlocking device 4 which “includes a second recess portion 41 recessed within the first recess portion 11 and a protrusion 42 disposed on the elastic arm 3, and the second recess portion 41 and the protrusion 42 engage with each other” in the fastening position. *Id.* In the fastening position, the “parallel portion 422 [of protrusion 42] is engaged with the bottom contact portion 411 [of second recess portion 41], the push claw 425 [of

protrusion 42] inserts into the hollow portion 412 [of second recess portion 41] to engage with the hollow portion 412, and the push block 424 [of protrusion 42] abuts against the top contact portion 413 [of second recess portion 41]. *Id.*

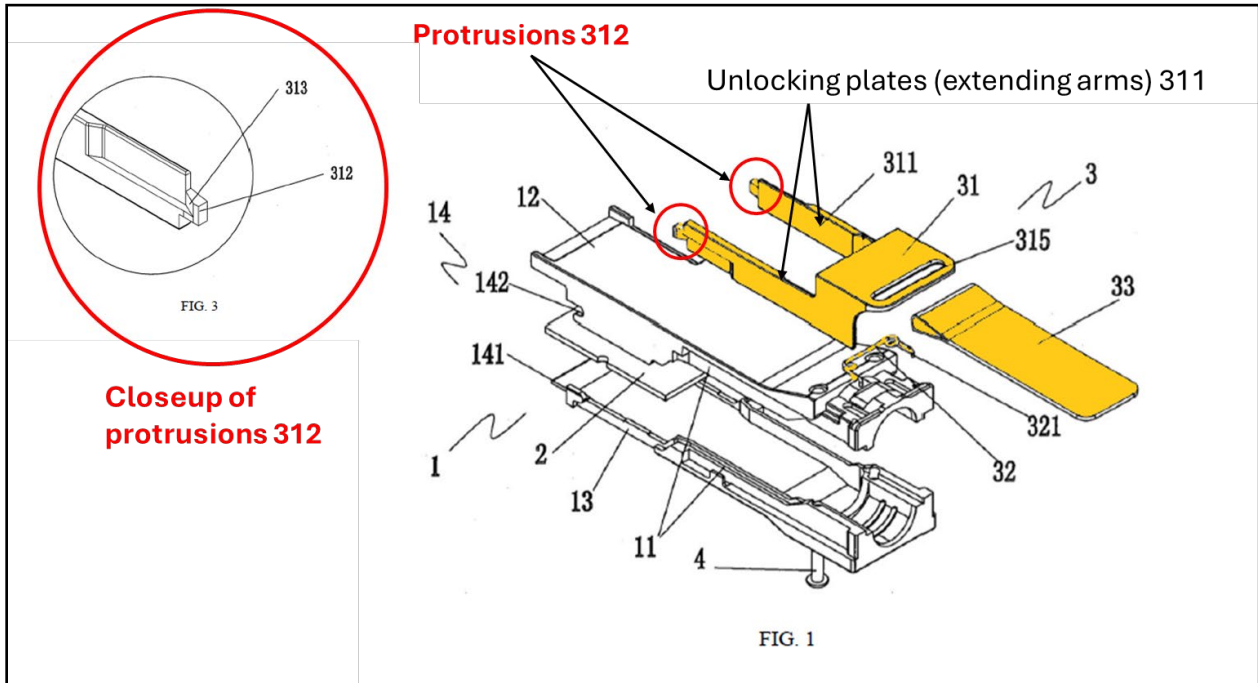
115. Similarly, when the sliding component (elastic arm 3) is pulled back, the unlocking device 4 is unlocked and the elastic arm 3 slides backward along the sliding slot until it reaches a stopping device 5, and therefore the sliding slot has a **releasing position**. Ex. 1005, ¶[0026] (“After the unlocking device 4 is unlocked, the elastic arm 3 slides along the first recess portion 11 until it reaches the stopping device 5.”). In the releasing position, **the protrusions 42 of the extending arms are disengaged from the first recess portions 41** provided on the sliding slots. *Id.*, ¶[0023]. Specifically, “[w]hen the elastic arm 3 is pulled to slide along the first recess portion 11, the protrusion 42 disengages from the second recess portion 41 via the first bent portion 421. Meanwhile, the push claw 425 is pulled out from the hollow portion 412, the push block 424 no longer abuts against the top contact portion 413, **the parallel portion 422 makes surface contact with the first recess portion 11 and slides along its track**, and the second bent portion 423 pushes away an elastic piece connected to a slot module (not shown) of the QSFP module interface device, allowing the QSFP module interface device to be smoothly unplugged.” *Id.*, ¶[0023] (emphasis added).

6. **Claim term 1[b][3] (“the two first fastening parts are fastened to the two second fastening parts when the two extending arms are located at the fastening position, and the two second fastening parts press the two first fastening parts, respectively, to make the two first fastening parts be farther away from each other when the two extending arms are located at the releasing position”)**

116. Li discloses that when the sliding component (elastic arm 3) is pulled to unlock the QSFP module interface device, “the protrusion 42 disengages from the second recess portion 41 via the first bent portion 421. Meanwhile, the push claw 425 is pulled out from the hollow portion 412, the push block 424 no longer abuts against the top contact portion 413, the parallel portion 422 makes surface contact with the first recess portion 11 and slides along its track, and **the second bent portion 423 pushes away an elastic piece connected to a slot module** (not shown) of the QSFP module interface device, allowing the QSFP module interface device to be smoothly unplugged.” Ex. 1005, ¶[0023]. Accordingly, a POSITA would have understood that in the fastening position of the sliding component (elastic arm 3), the elastic piece on each side of the slot module (first fastening part) engages with or fastens to the second bent portion 423 (second fastening part) of protrusion 42. Indeed, this is a standard and common practice in the industry. And when the sliding component is pulled and the sliding component slides backward along the sliding slot (first recess portion 11) to achieve a releasing position, the two second fastening parts (bent portions 423) press the two first fastening parts (elastic pieces), such that

the two first fastening parts are pushed farther away from each other. Ex. 1005, ¶[0023].

117. Liu discloses a similar method of locking/unlocking between a QSFP module interface device and a socket. Specifically, Liu teaches that when the QSFP module is “plugged into a corresponding socket of a connector, **locking members pre-configured in the socket engage with the protrusions 312 on the outer walls of the two unlocking plates 311 [extending arms]**” to fasten the module to the socket. Ex. 1006, ¶[0020] (emphasis added), Figs. 1 and 3. When the QSFP module needs to be unplugged, “the pulling handle 33 can be simply pulled outward, so that the unlocking member 31 is pulled by the pulling handle 33 to move outward. Meanwhile, **the protrusion 312 and the inclined surface 313 on the unlocking plate 311 push the locking member of the socket out,**” so that the module is released from the socket and “can be smoothly unplugged.” *Id.* (emphasis added).



Ex. 1006, Figs. 1 and 3 (showing protrusions 312 on unlocking plates 311 of Liu's QSFP module that engage with locking members on a corresponding socket)

118. To the extent it is argued that Li does not explicitly disclose the locking/unlocking mechanism between the second fastening parts on Li's QSFP module interface device and the first fastening parts of the pluggable slot, Liu describes a similar locking/unlocking mechanism in greater detail. For at least the reasons discussed in Section IX.A, above, a POSITA would have considered Li and Liu together to design a locking/unlocking mechanism that is efficient, reliable, and easy to plug in and out. Specifically, a POSITA would have been motivated to combine the teachings of Liu with Li to design an effective hot-pluggable mechanism between a QSFP module and a plugging slot/socket. *See* Section IX.A,

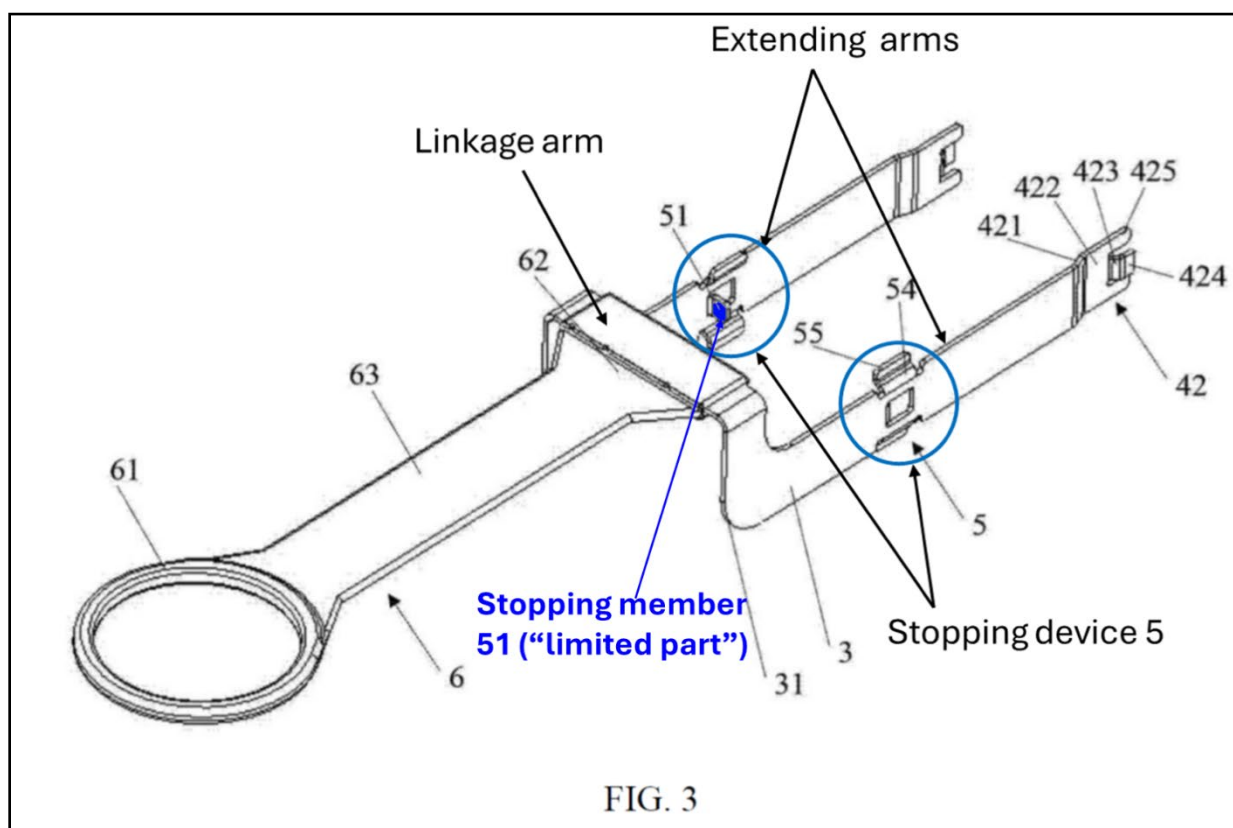
above. Given the similarities in design and operation between the Li and Liu, a POSITA would also have reasonably expected success in combining the teachings of Li and Liu. *Id.*

119. More specifically, a POSITA would have been motivated to design Li's unlocking device 4 in such a way that when Li's QSFP module interface device is plugged into a socket and the sliding component is in the fastening position, the second bent portions 423 of protrusions 42 engage with the elastic pieces on the socket—in the same way as Liu's protrusions 312 engage with locking members on the socket—to achieve an effective and reliable fastening between the QSFP module and the socket. Ex. 1005, ¶[0023]; Ex. 1006, ¶[0020]. And when Li's QSFP module interface device is to be unplugged, the second bent portions 423 push away the elastic pieces on the socket to be farther away from each other—in the same way as Liu's protrusions 312 push the locking members of the socket out—to release the QSFP module and allow it to be smoothly and reliably unplugged. Ex. 1005, ¶[0023]; Ex. 1006, ¶[0020]. The locking mechanism of Li in view of Liu would thus have two first fastening parts (of the pluggable slot) that are fastened to the two second fastening parts (second bent portions 423) when the extending arms are located at the fastening position, and the two second fastening parts press the two

first fastening parts apart from each other when the extending arms are at the releasing position.

7. **Claim term 1[b][4] (“wherein each extending arm has a limited part configured to move in the at least one limiting space”)**

120. Each extending arm of the sliding component (elastic arm 3) of Li's QSFP module interface device includes a stopping device 5, which further includes a stopping member 51 (i.e., a "limited part") extending from elastic arm 3. Ex. 1005, Fig. 3.



Ex. 1005, Fig. 3 (annotations added)

121. The stopping member 51 (limited part) is a “stopping plate” and engages with the third recess portion 52 (the limiting space). Ex. 1005, ¶[0025]. Li additionally discloses that a return spring is disposed in the third recess portion 52 (the limiting space) between the stopping member 51 (limited part) and the side end of the third recess portion 52 opposite to the stopping member 51. *See id.*, ¶[0027]. “After the unlocking device 4 is unlocked, the elastic arm 3 slides along the first recess portion 11 until it reaches the stopping device 5.” *Id.*, ¶[0026]. A POSITA would have understood from the disclosures of Li that stopping member 51 (limited part) is configured to move in the third recess portion 52 (limiting space) when elastic arm 3 (sliding component) is slid along first recess portion 11 (sliding slot) to achieve a fastening position and a releasing position. *Id.*, ¶[0025] (“stopping member 51 is engaged with the third recess portion 52, and the stopping member 51 is a stopping plate”), ¶[0026] (“After the unlocking device 4 is unlocked, the elastic arm 3 slides along the first recess portion 11 until it reaches the stopping device 5. Meanwhile, the third recess portion 52 forms a block against the side end of the stopping member 51, preventing the stopping member from moving.”).

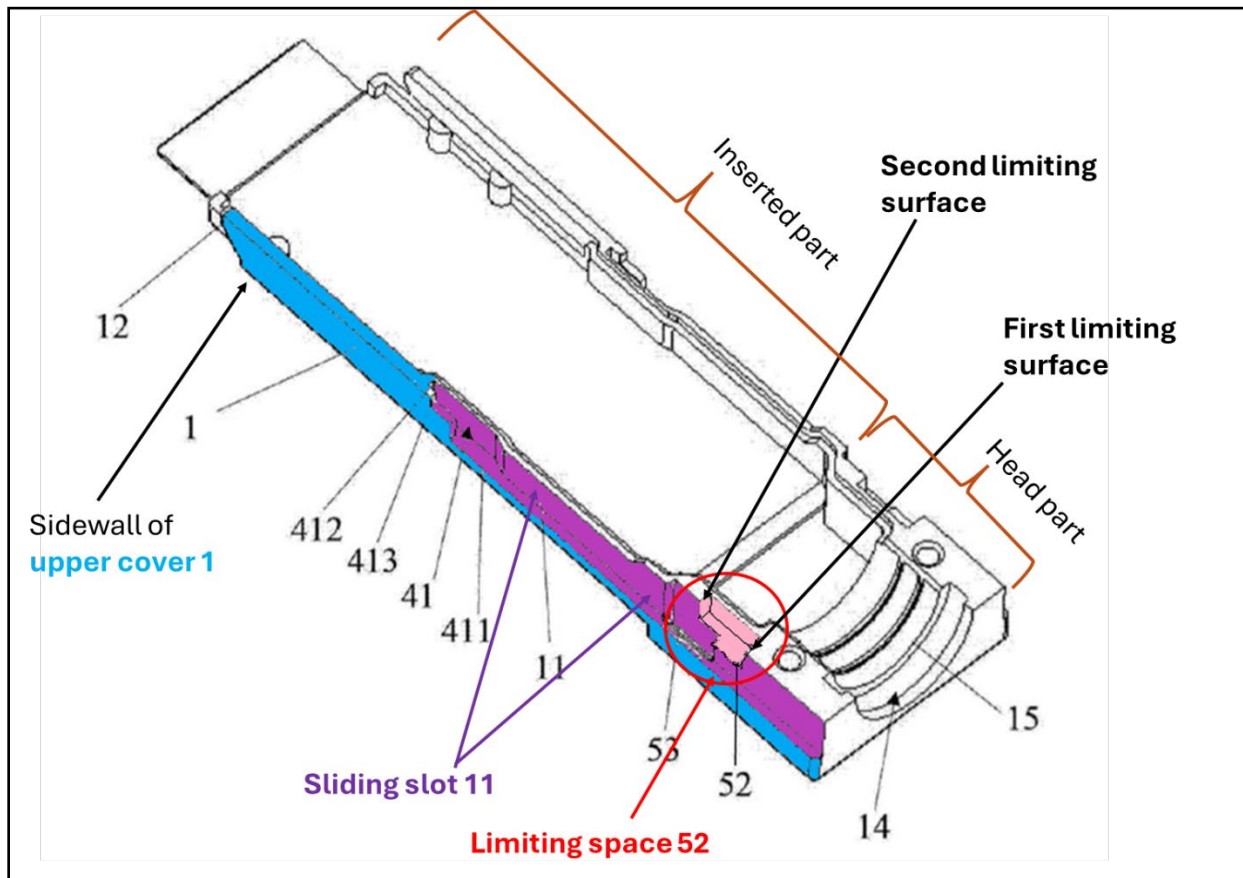
8. **Claim term 1[c] (“an elastic component, wherein the main body has a first limiting surface and a second limiting surface forming the limiting space, the first limiting surface is closer to the head part than the second limiting surface, and the elastic component is located in the limiting space and between the first limiting surface and the limited part and is**

covered by the extending arm such that the elastic component is confined by the main body and the sliding component.”)

122. Li discloses that a return spring device (i.e., an “elastic component”) is disposed in the third recess portion 52 (the limiting space) between the stopping member 51 (limited part) and the side end of the third recess portion 52 opposite to the stopping member 51. Ex. 1005, ¶[0027]. As discussed above, the third recess portion 52 (limiting space) is formed in the first recess portion 11 (sliding slot) on the main body of the QSFP module interface device. *See* Section IX.B.3. Although Li shows that the third recess portion 52 (limiting space) is formed in the head part of the main body, a POSITA would have easily known and understood that the limiting space could have been positioned anywhere along the first recess portion 11 (sliding slot). As shown in Figure 5 below, there is plenty of space along sliding slot 11 to reposition limiting space 52 to a portion of the sliding slot that is in the inserted part of the main body. Indeed, positioning of the limiting space 52 anywhere along the sliding slot 11 is an obvious matter of design choice because there are no distinct advantages associated with placement of limiting space 52 in the inserted part versus the head part. Nowhere does the ’826 patent disclose that the placement of the limiting space in the inserted part is critical, results in a difference in function, or achieves unexpected results. Accordingly, positioning of Li’s limiting space 52 in the inserted part instead of the head part would have been an obvious design choice.

For example, Mizue discloses a similar limiting space that is located on a side surface of the inserted part. *See* Section VIII.A.8. At a minimum, a POSITA would have understood that it would have been obvious to try and reposition Li's limiting space 52 to the inserted part to free up space along the width of the head part to accommodate more electronic components in that space, and thus meet the requirements of compactness and proper space utilization in the optical transceiver.

123. As shown below, the side surfaces of third recess portion 52 (limiting space) form first and second limiting surfaces. Ex. 1005, Fig. 5. When limiting space 52 is repositioned to a portion of the sliding slot that is in the inserted part of the main body (as discussed above), the first limiting surface will be closer to the head part (portion that connects with an optical cable or electrical cable 7) than the second limiting surface. Ex. 1005, Figs. 4 and 5.



Ex. 1005, Fig. 4 (showing first and second limiting surfaces)

124. Li additionally discloses that the return spring (elastic component) is disposed in the third recess portion 52 (the limiting space) between the stopping member 51 (limited part) and a side end of the third recess portion 52 opposite to the stopping member 51. *See id.*, ¶[0027] (“The return spring device is a spring, **with one end abutting against the stopping member 51 and the other end abutting against the side end of the third recess portion 52 opposite to the stopping member 51.**”) (emphasis added). Although Li does not explicitly disclose that the return spring is disposed between the stopping member 51 and the side surface closer to the head

part (i.e., the first limiting surface), a POSITA would have understood that the return spring must be disposed between stopping member 51 and the first limiting surface to generate a rebound force under the action of the spring when the unlocking device 4 is unlocked and elastic arm 3 (sliding component) is slid backward towards the head part, thereby compressing the spring between the stopping member 51 and the first limiting surface. *See id.* That is, the elastic component (spring device) is confined or limited longitudinally by the first limiting surface of the limiting space 52 and the limited part 51.

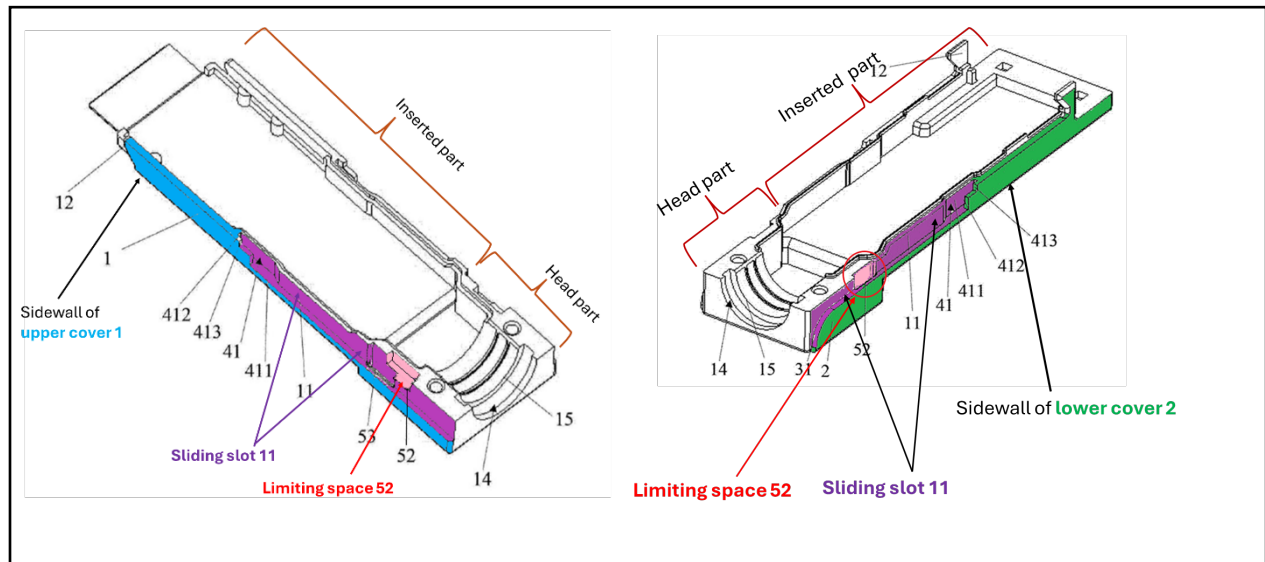
125. Additionally, as shown in Figures 1 and 2, the elastic component (spring device) is covered by the extending arm of the sliding component (elastic arm 3) such that the elastic component is confined by the main body and the sliding component. Specifically, the elastic component is housed in the third recess portion 52 (limiting space), which is a recessed region within first recess portion 11 (sliding slot), and Li discloses that elastic arm 3 (sliding component) slides along first recess portion 11. Ex. 1005, ¶[0022] (“The elastic arm 3 is engaged with the first recess portion 11 and capable of sliding along a track formed by the first recess portion 11”) and ¶[0025] (discussing that “a third recess portion 52 [is] recessed within the first recess portion 11”). Accordingly, a POSITA would have understood that the elastic component (spring device) would have been confined laterally by the sliding

slot of the main body on one side and the extending arm on the other side, and further confined longitudinally by the first limiting surface (of the main body) and the limited part 51. Ex. 1005, Figs. 1 and 2. That is, a POSITA would have understood that the elastic component is covered by the extending arm of the sliding component (elastic arm 3) and that the elastic component is confined by the sliding slot (first recess portion 11) of the main body and the sliding component. *Id.*

C. Claim 2 (“The pluggable optical transceiver module according to claim 1, wherein the main body comprises a head part and an inserted part connected to each other, the inserted part is configured to be inserted into the socket, the two side surfaces are located at two sides of the head part and the inserted part opposite to each other, respectively, wherein both the two sliding slots extend from the head part towards the inserted part, and the two extending arms are able to slide relative to the two sliding slots to have the fastening position which is farther away from the head part and the releasing position which is closer to the head part.”)

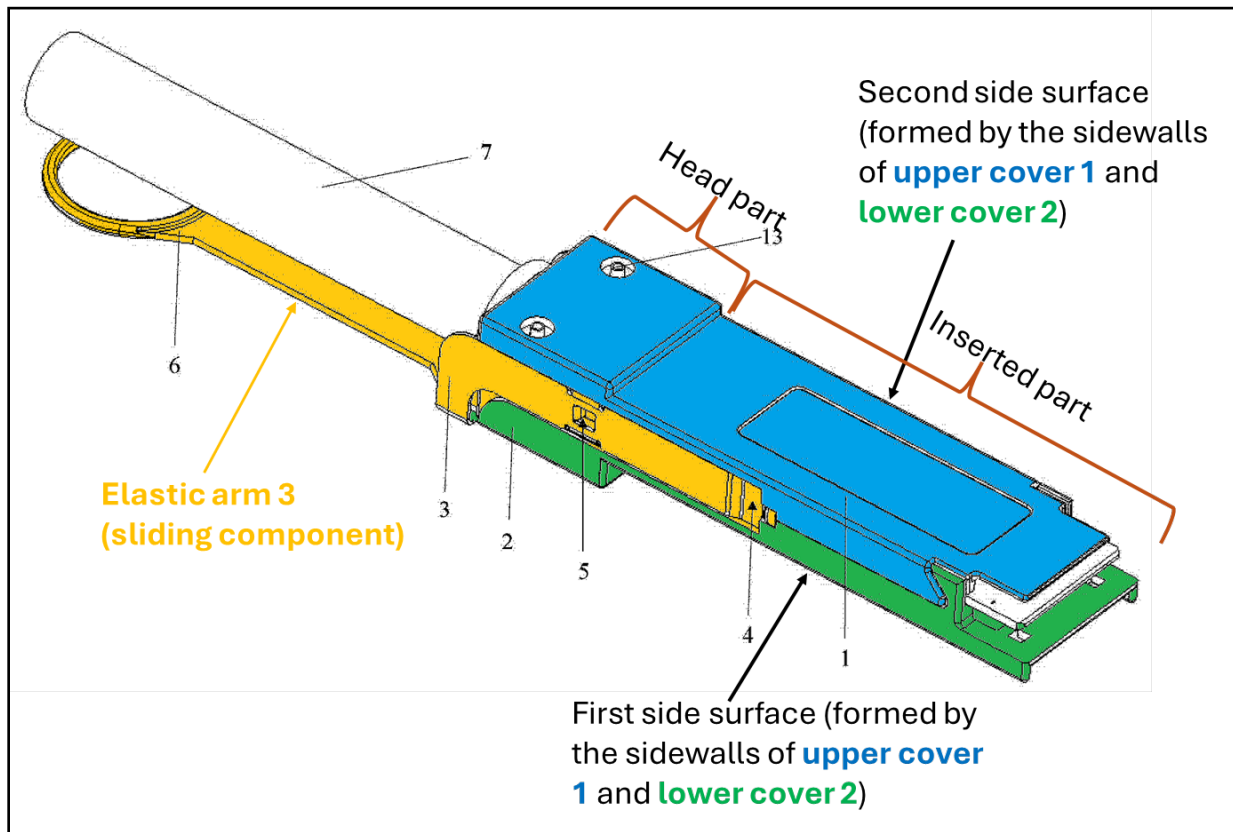
126. As shown in Figures 3 and 4, below, the main body of Li’s QSFP module interface device, which is formed by upper cover 1 and lower cover 2, comprises a head part and an inserted part connected to each other. The “head part” is the portion that connects with optical or electrical cable 7, and the remainder of the main body is the “inserted part” because it is inserted/plugged into a slot/space in a corresponding socket. *See* Ex. 1005, Abstract, ¶¶[0002], [0003], [0029]. Based on Li’s discussion of “hot plugging” and a “slot module,” a POSITA would have

understood that the inserted part would be configured to be inserted into the slot module (socket). *Id.*



Ex. 1005, Figs. 4 and 5 (showing head part and inserted part of the main body, and that the two **sliding slots 11** on opposite side surfaces of the main body extend from the head part towards the inserted part)

127. As further shown in Figure 1, annotated below, two opposite side surfaces, formed by the sidewalls of upper cover 1 and lower cover 2, are located at the sides of the head part and the inserted part. Figures 4 and 5, annotated above, further show that the two sliding slots (first recess portions 11) extend from the head part towards the inserted part.



Ex. 1005, Fig. 1 (showing two opposite side surfaces located at the sides of the head part and the inserted part)

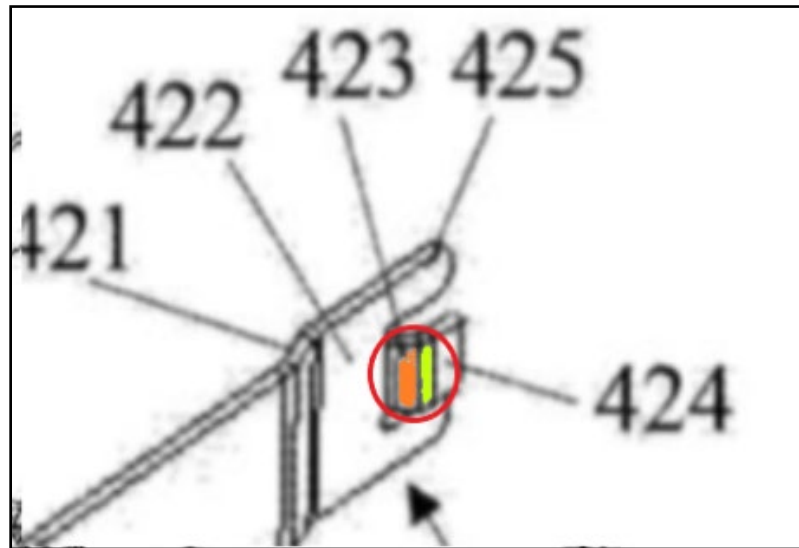
128. Li additionally discloses that the two extending arms of the sliding component (elastic arm 3) slide relative to the two sliding slots formed by first recess portions 11. Ex. 1005, ¶[0022] (“The elastic arm 3 is engaged with the first recess portion 11 and capable of **sliding along a track formed by the first recess portion 11.**”) (emphasis added); *see also id.* Figs. 4, 5. As discussed above in Section IX.B.5, the extending arms of the sliding component (elastic arm 3) slide along the sliding slot to have a **fastening position** when protrusions 42 of the extending arms are engaged

with the first recess portions 41 provided on the sliding slots (first recess portions 11) on each side of the main body. Ex. 1005, ¶[0023]. And when the sliding component (elastic arm 3) is pulled back, the unlocking device 4 is unlocked and the elastic arm 3 slides backward along the sliding slot until it reaches a stopping device 5, and thereby the sliding slot achieves a **releasing position**. Ex. 1005, ¶[0026]. Because the sliding component (elastic arm 3) is pulled back towards the head part to release/disengage the QSFP module interface device from the slot/socket, the fastening position of the sliding component is farther away from the head part compared to the releasing position (which is closer to the head part because the sliding component is pulled back to release it from the slot/socket).

D. Claim 3 (“The pluggable optical transceiver module according to claim 2, wherein each second fastening part has a fastening surface, and a distance between one side of the fastening surface which is close to the side surface and the head part is less than a distance between another side of the fastening surface which is far away from the side surface and the head part.”)

129. Li discloses that each second bent portion 423 (second fastening part) of protrusion 42 engages with a corresponding elastic part on the slot module to lock the QSFP module interface device to the slot. Ex. 1005, ¶[0023]. As shown below in annotated Figure 3, the second bent portion 423 has a fastening surface having two sides (shown in orange and lime green). *Id.*, Figs. 1 and 3. Because the second bent portion 423 bends away from the side surface of main body, one side (shown

in orange) is closer to the side surface than the other side (shown in lime green). Moreover, a distance between the side closer to the side surface and the head part is less than a distance between the other side (that is farther away from the side surface) and the head part.

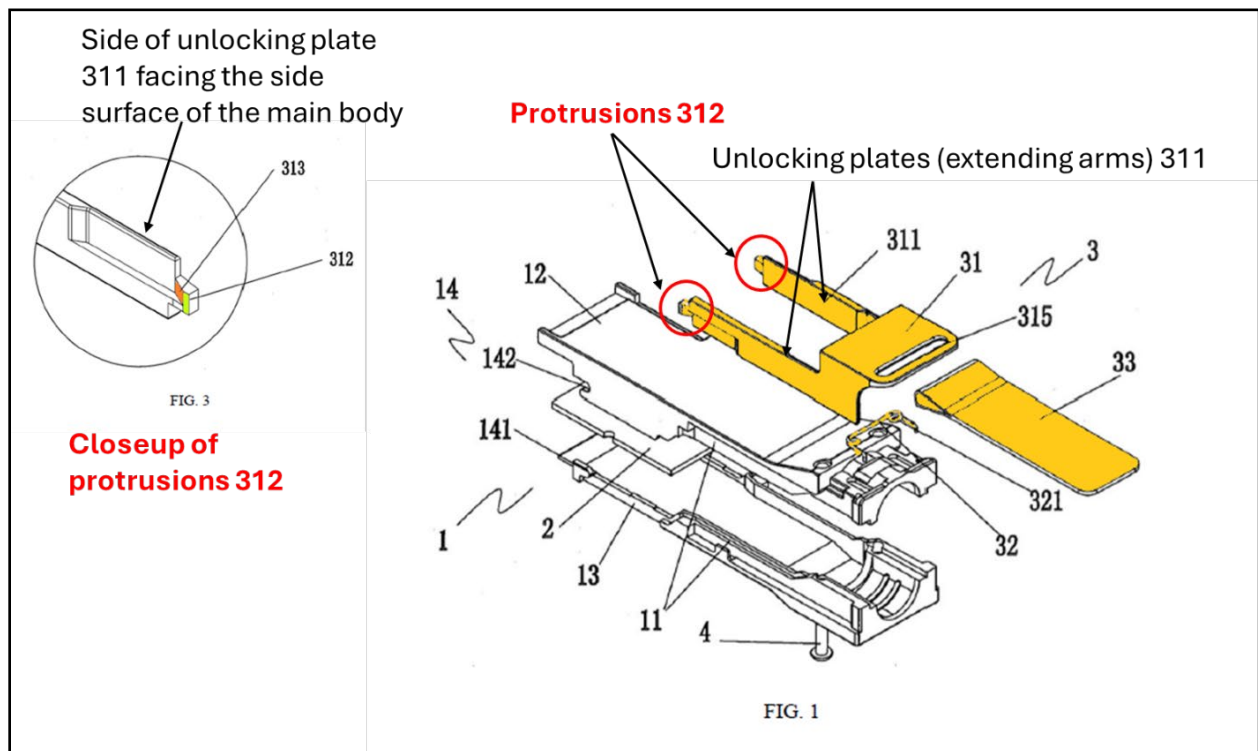


Ex. 1005, excerpt of Fig. 3 (showing that each second fastening part (second bent portion 423 of protrusion 42) has two surfaces: one closer to the side surface (of the main body) and the head part and another farther away from the side surface and the head part)

130. As discussed in Section IX.A, above, a POSITA would have been motivated to combine the teachings of Li and Liu to achieve an improved locking mechanism between the QSFP module interface device and the slot/socket. Liu teaches that when the QSFP interface module is plugged into a corresponding socket of a connector, “**locking members [first fastening parts] pre-configured in the socket**

engage with the protrusions 312 [second fastening parts] on the outer walls of the two unlocking plates 311 [extending arms]” to fasten the module to the socket.

Ex. 1006, ¶[0020] (emphasis added), Figs. 1 and 3. As shown in Figures 1 and 3 of Liu, each protrusion 312 bends away from the side surface of the main body, one side of protrusion 312 (inclined surface 313, shown in orange) is closer to the side surface than the other side (shown in lime green). Moreover, a distance between the side closer to the side surface (inclined surface 313) and the head part is less than a distance between the other side (that is farther away from the side surface) and the head part.



Ex. 1006, Figs. 1 and 3 (showing that each second fastening part (protrusion 312) has two surfaces: one closer to the side surface (of the main body) and the head part and another farther away from the side surface and the head part)

E. Claim 4 (“The pluggable optical transceiver module according to claim 2, wherein the head part has at least one optical fiber terminal.”)

131. Li discloses that its design allows an optical cable, i.e., a cable having an optical fiber, or an electrical cable 7 to be fixed to the QSFP module interface device. Ex. 1005, ¶[0022]. Figures 4 and 5 additionally show arc-shaped portions 14 on upper cover 1 and lower cover 2 that engage to form a circular portion in the head part of the QSFP module interface device, which allows an optical cable 7 to be connected to the module. *Id.*; *see also id.*, Figs. 4 and 5. Thus, it would have been obvious to a POSITA that the head part of Li’s QSFP module interface device has at least one optical fiber terminal.

F. Claim 5 (“The pluggable optical transceiver module according to claim 1, further comprising two elastic components, wherein the number of the at least one limiting surface is two, the main body has two first limiting surfaces and two second limiting surfaces forming the two limiting spaces together, respectively, the two first limiting surfaces are closer to the head part than the two second limiting surfaces, the two elastic components are located in the two limiting spaces, respectively, and each elastic component is between the first limiting surface and the limited part.”)

132. As discussed with regard to claim term 1[c] (Section IX.B.8), Li discloses that a return spring device (elastic component) is disposed in the third recess portion 52

(the limiting space) between the stopping member 51 (limited part) and the side end of the third recess portion 52 opposite to the stopping member 51. Ex. 1005, ¶[0027]. As shown in Figure 3 of Li, a limited part 51 is provided on each extending arm of elastic arm 3. This would indicate to a POSITA that there are two third recess portions 52 (i.e., two limiting spaces) on the two side surfaces of the QSFP module interface device and that there are two elastic components, each disposed in a respective limiting space on each side of the module. As such, a POSITA would also have understood that in Li's QSFP module interface device (modified to have each limiting space 52 in a portion of sliding slot 11 that is in the inserted portion of the module), each limiting space 52 is formed by first limiting surface and a second limiting surface, i.e., there are two first limiting surfaces and two second limiting surfaces, with the two first limiting surfaces being closer to the head part than the two second limiting surfaces. *See* Section IX.B.8, above.

133. As further discussed with respect to claim term 1[c], Li additionally discloses that the return spring (elastic component) is disposed in the third recess portion 52 (the limiting space) between the stopping member 51 (limited part) and the first limiting surface to generate a rebound force under the action of the spring when the unlocking device 4 is unlocked and elastic arm 3 (sliding component) is slid backward towards the head part. *See id.* It would have been obvious to a POSITA

that the same mechanism would have been applied to both elastic components on both side surfaces of the QSFP module interface device. That is, it would have been obvious to a POSITA that each elastic component of Li is between a first limiting surface and a limited part 51.

G. Claim 6 (“The pluggable optical transceiver module according to claim 1, wherein the pluggable optical transceiver module further comprises a pull handle pivoted on the linkage arm of the sliding component.”)

134. Li’s QSFP module interface device includes a pull handle 6 connected to the linkage arm of elastic arm 3 (sliding component). Ex. 1005, ¶[0028], Figs. 1, 2, and 3. Although Li does not disclose that pull handle 6 is pivoted on the linkage arm 6, it would have been obvious to design pull handle 6 to pivot on the linkage arm to prevent breakage or damage of the pull handle if bent downwards or upwards when being pushed or pulled by a user, and thus to give more flexibility when plugging/unplugging the QSFP module interface device, and also to move the pull handle out of the way when inserting/retracting optical cable 7. Indeed, Liu teaches a pulling handle 33 that is “sleeved onto a hanging ear portion 315 pre-configured at the rear end of the unlocking member 31.” Ex. 1006, ¶[0019]. Figure 1 of Liu shows that pulling handle 33 is designed to pivot slightly about the rear end of unlocking member 31 (i.e., the linkage arm of Liu’s sliding component 3). A POSITA would have been motivated to design Li’s pull handle 6 in view of Liu’s pulling handle 33

(that is sleeved through a hanging ear portion 315 of Liu's linkage arm) to allow Li's pull handle 6 to pivot somewhat on the linkage arm to prevent breakage or damage of the pull handle when the QSFP module is inserted or disengaged from the slot module and/or to move it up or down when inserting cable 7 to get the handle out of the way.

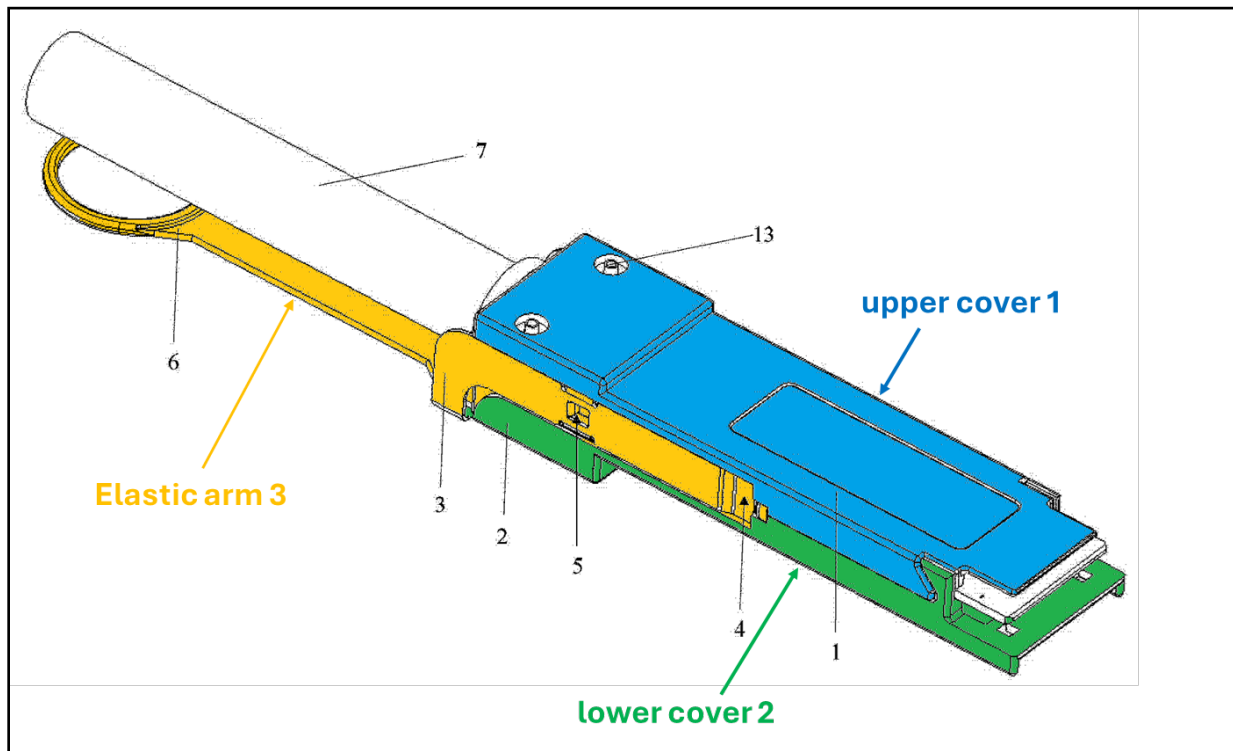
X. [GROUND 3] LI RENDERS CLAIM 7 OBVIOUS

A. Independent claim 7

135. Li discloses or suggests every limitation of claim 7.

1. 7[preamble] ("A pluggable optical transceiver module, comprising:")

136. Li discloses a QSFP module interface device (i.e., a pluggable optical transceiver module) capable of hot plugging. Ex. 1005, Abstract, ¶¶[0002], [0003], Fig. 1. Li additionally discloses that the module is capable of plugging into a slot module. *Id.*, ¶[0023] (discussing "an elastic piece connected to a slot module (not shown) of the QSFP module interface device, allowing the QSFP module interface device to be smoothly unplugged."). A POSITA would have understood Li's QSFP module interface device to be a "pluggable optical transceiver module."

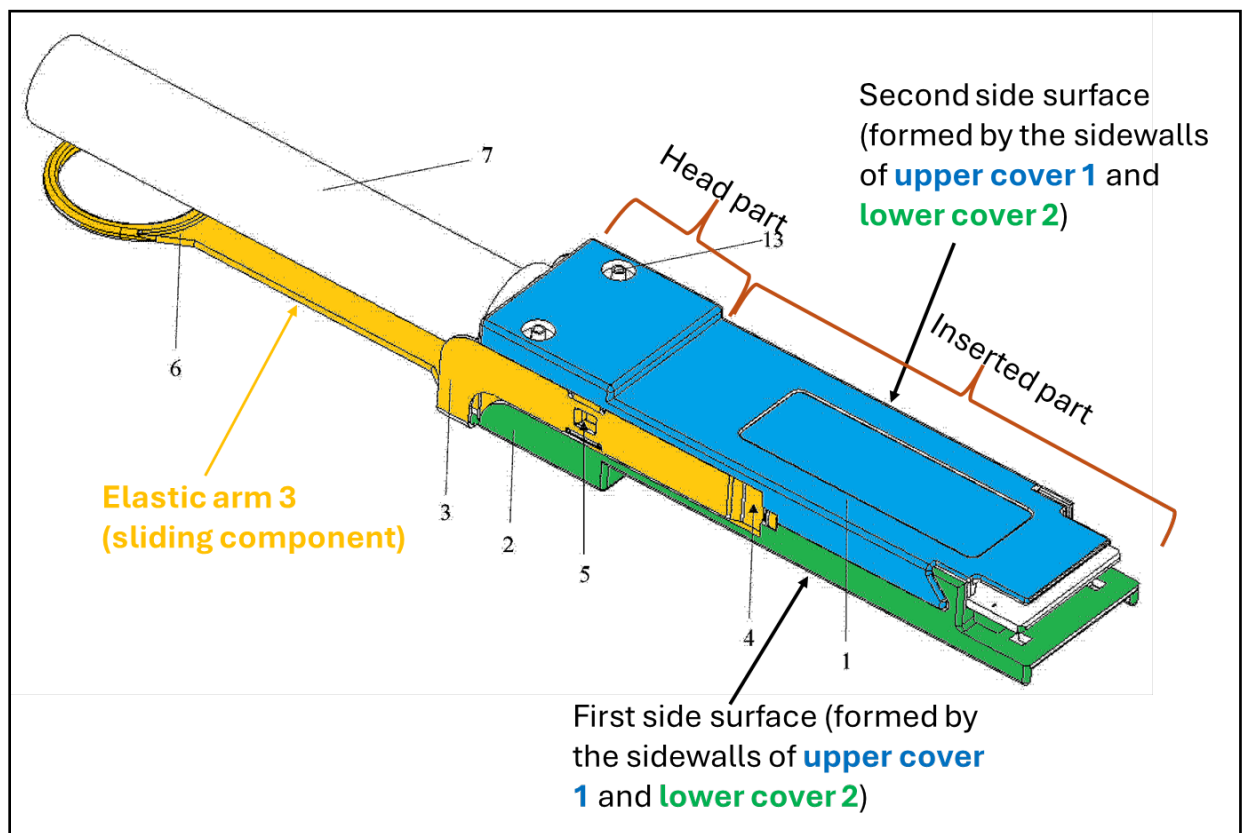


Ex. 1005, Fig. 1 (showing a QSFP module interface comprising, among other parts, an **upper cover 1**, a **lower cover 2**, and an **elastic arm 3**)

2. **Claim term 7[a][1] (“a main body having a head part and an inserted part that are connected to each other, wherein the main body further comprises opposite two side surfaces and two sliding slots which are located at two sides of the head part and the inserted part opposite to each other, respectively, the two sliding slots are located at the two side surfaces, and the two sliding slots extend from the head part to the inserted part, respectively”)**

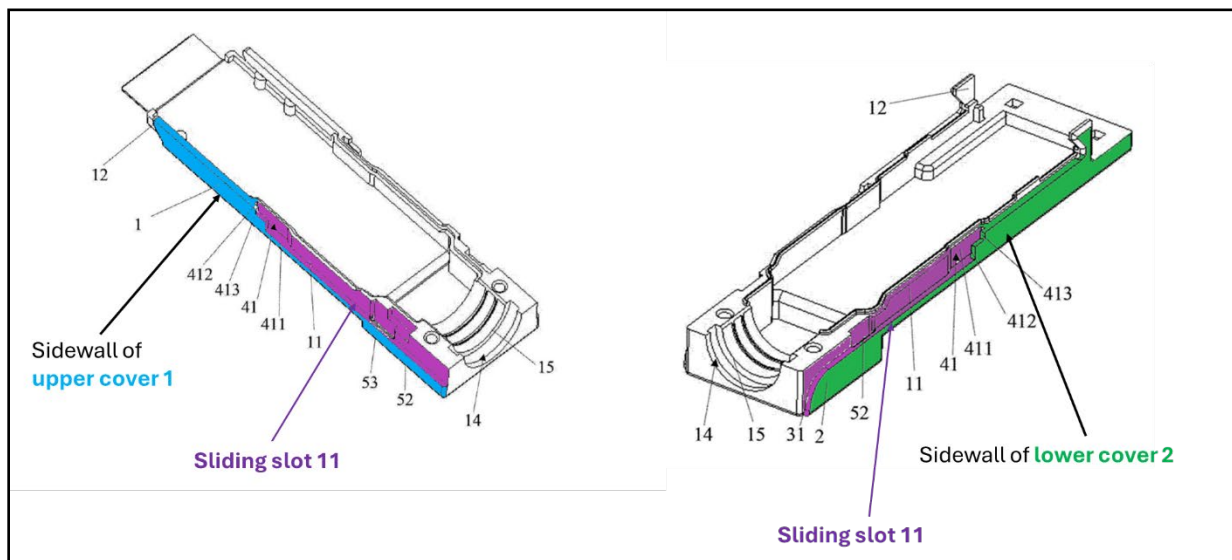
137. Li discloses a QSFP module interface device “including: an upper cover 1, a lower cover 2, and elastic arms 3.” Ex. 1005, ¶[0022]. Upper cover 1 and lower cover 2 together form the main body of the QSFP module interface device, having a head part and an inserted part that are connected to each other, as shown in annotated

Figure 1, below. “Two opposite sides of the upper cover 1 are connected to the lower cover 2 at connecting positions, and the connecting positions have first recess portions 11 recessed thereon.” *Id.*; *see also id.*, Figs. 1, 4, 5. As shown in Figure 1 (annotated below), the main body includes two side surfaces at opposite sides, wherein each side surface is formed by a sidewall of upper cover 1 and a sidewall of lower cover 2 that interlock with each other. As a POSITA would have understood, the two side surfaces would be opposite to each other.



Ex. 1005, Fig. 1 (showing the main body having two side surfaces that are opposite to each other)

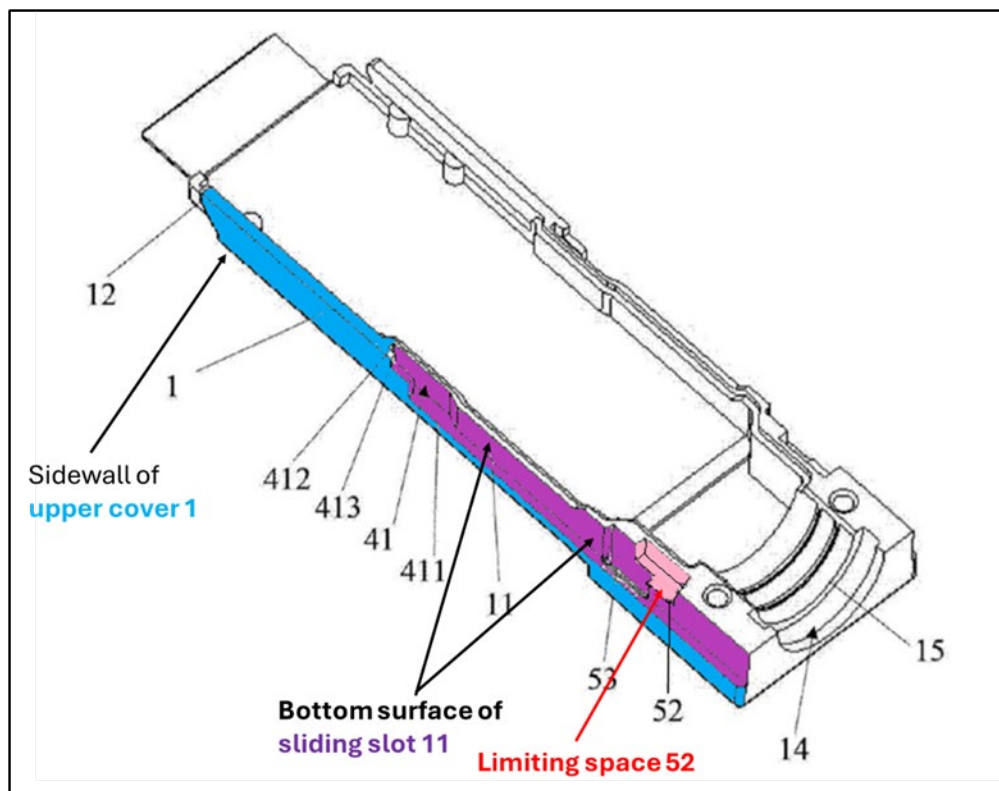
138. Each side surface of Li's QSFP module interface device further includes a sliding slot formed by first recess portion 11 on the sidewalls of upper cover 1 and lower cover 2. Ex. 1005, ¶[0022]. Because each side surface (including the head part and the inserted part) has a sliding slot, the two sliding slots of Li's QSFP module interface device are opposite each other. *Id.*, Figures 3 and 4. "The elastic arm 3 is engaged with the first recess portion 11 and capable of sliding along a track formed by the first recess portion 11." *Id.*, ¶[0022]; *see also id.* Figs. 4, 5. As shown in annotated Figures 4 and 5, below, each sliding slot extends from the head part to the inserted part.

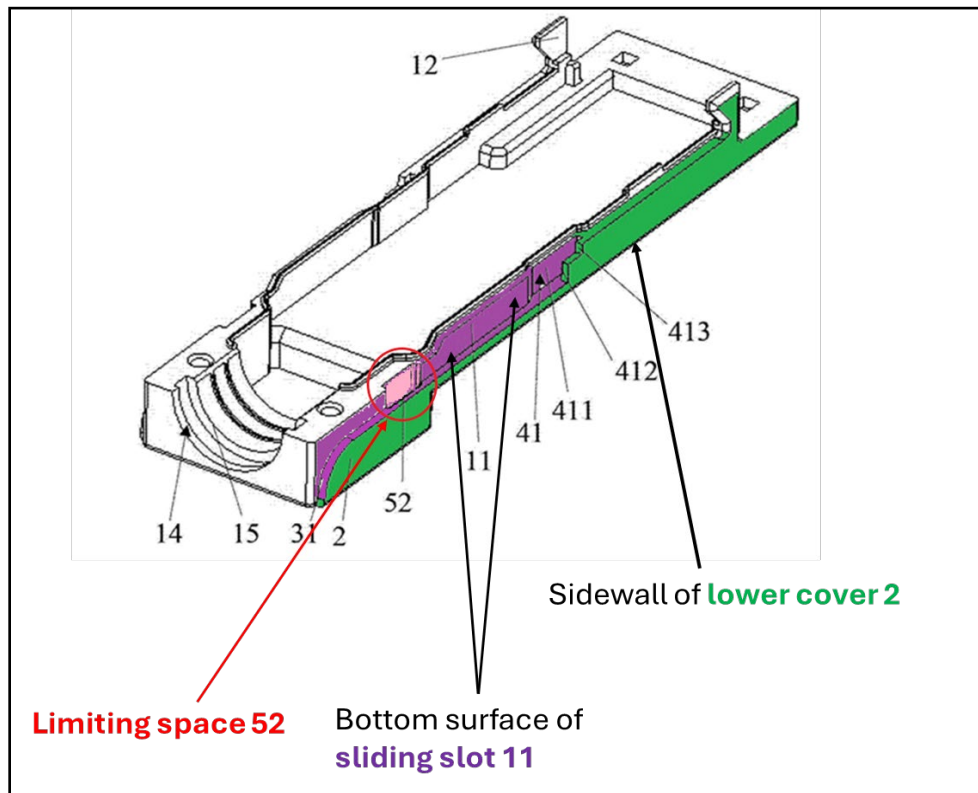


Ex. 1005, Figs. 4 and 5 (showing a **sliding slot** (formed by recess portion 11) on each side surface of the main body when the **upper cover 1** and **lower cover 2** are connected, and each sliding slot extends from the head part to the inserted part)

3. **Claim term 7[a][2] (“wherein the main body has at least one limiting space and two bottom surfaces forming the two sliding slots, respectively, the two bottom surfaces are parallel to the two side surfaces, the at least one limiting space is located at one of the two side surfaces”)**

139. Each sliding slot (first recess portion 11) on each side surface of Li’s QSFP module interface device includes a bottom surface and a limiting space (third recess portion 52) that together form the sliding slot. Ex. 1005, ¶[0025] (discussing that “a third recess portion 52 [is] recessed within the first recess portion 11”), Figs. 4 and 5. As shown in Figures 4 and 5, annotated below, the bottom surface of each sliding slot is parallel to the adjacent side surface, and the each third recess portion 52 (limiting space) is located at a side surface.

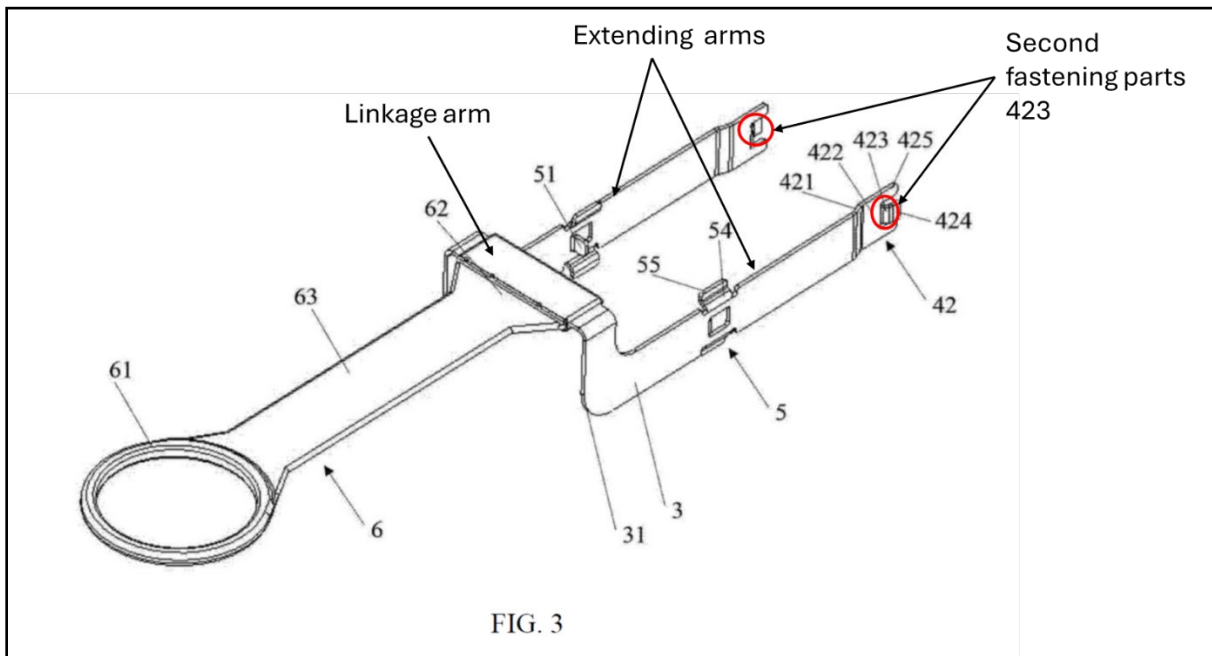




Ex. 1005, Figs. 4 and 5 (showing that the bottom surface of each **sliding slot 11** is parallel to the adjacent side surface, and that each **limiting space 52** is located at a side surface)

4. **Claim term 7[b][1] (“a sliding component comprising a linkage arm and two extending arms, wherein the linkage arm is connected between the two extending arms, each extending arm has a second fastening part, the main body is between the two extending arms,”)**

140. Li’s QSFP module interface device includes an elastic arm 3 (i.e., a “sliding component”) comprising a linkage arm and two extending arms. Ex. 1005, Figs. 1-3. As shown in Figure 3, annotated below, the linkage arm is connected between the two extending arms. *See also id.*, Figs. 1 and 2.

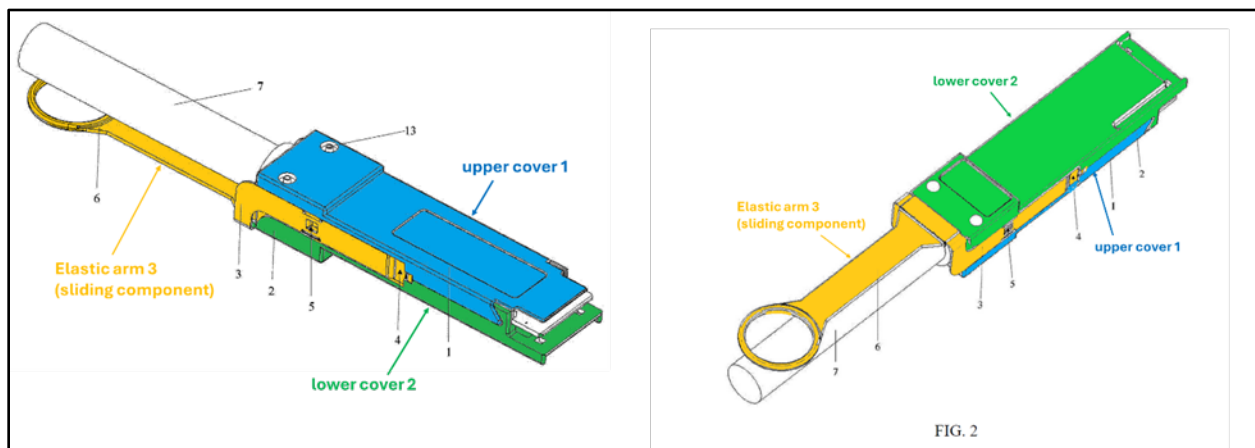


Ex. 1005, Fig. 3 (showing Li's sliding component (elastic arm 3) having two extending arms and a linkage arm, and a fastening part (part 423 of protrusion 42) provided at the end of each extending arm)

141. Each extending arm of the sliding component (elastic arm 3) includes a protrusion 42 provided at the end that is farthest away from the linkage arm. Ex. 1005, Fig. 3. Li's further describes that "protrusion 42 [is] disposed on the elastic arm 3, and the **second recess portion 41 [provided on the sliding slot] and the protrusion 42 engage with each other. The protrusion 42 is provided at the end of the elastic arm 3** and includes a first bent portion 421, a parallel portion 422 connected to the first bent portion 421 and parallel to the elastic arm 3, **a second bent portion 423 connected to the parallel portion 422**, a push block 424

connected to the second bent portion 423, and a push claw 425 connected to the parallel portion 422. The push claw 425 and the second bent portion 423 are arranged in parallel at one end of the parallel portion 422.” Ex. 1005, ¶[0023] (emphases added). Li further discloses that at least each **second bent portion 423** (second fastening part) engages with an elastic part on the slot module to lock the QSFP module interface device to the slot. *See id.*

142. As shown in Figures 1 and 2 of Li, the main body (formed by upper cover 1 and lower cover 2) is disposed between the two extending arms.



Ex. 1003, Figs. 1 and 2 (showing that the main body of Li’s QSFP module interface device is disposed between the two extending arms of sliding component 3)

5. **Claim term 7[b][2] (“the two extending arms are able to slide relative to the two sliding slots to have a fastening position which is farther away from the head part and a releasing position which is closer to the head part,”)**

143. Li discloses that each extending arm of the sliding component (elastic arm 3) is disposed on a sliding slot (first recess portion 11) provided on a side surface of the main body of Li's QSFP module interface device and each extending arm is able to slide relative to the sliding slot on which it is disposed. Ex. 1005, ¶[0022] ("Two opposite sides of the upper cover 1 are connected to the lower cover 2 at connecting positions, and the connecting positions have first recess portions 11 recessed thereon. **The elastic arm 3 is engaged with the first recess portion 11 and capable of sliding along a track formed by the first recess portion 11.**") (emphasis added), Figs. 1 and 2.

144. The extending arms of the sliding component (elastic arm 3) slide along the sliding slots to have a **fastening position when protrusions 42 of the extending arms are engaged with first recess portions 41** provided on the sliding slots (recess portions 11) on each side of the main body. Ex. 1005, ¶[0023]. Specifically, Li's QSFP module interface device includes an unlocking device 4 which "includes a second recess portion 41 recessed within the first recess portion 11 and a protrusion 42 disposed on the elastic arm 3, and the second recess portion 41 and the protrusion 42 engage with each other" in the fastening position. *Id.* In the fastening position, the "parallel portion 422 [of protrusion 42] is engaged with the bottom contact portion 411 [of second recess portion 41], the push claw 425 [of protrusion 42]

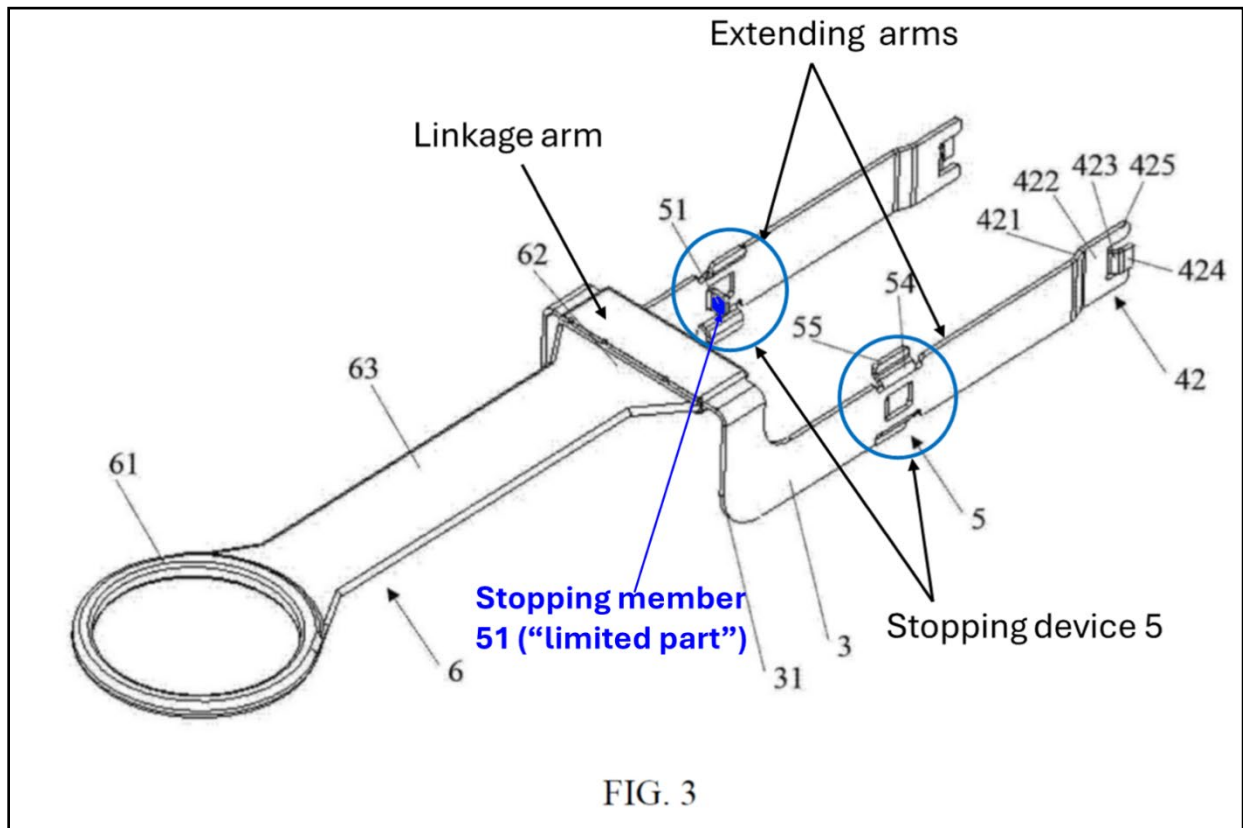
inserts into the hollow portion 412 [of second recess portion 41] to engage with the hollow portion 412, and the push block 424 [of protrusion 42] abuts against the top contact portion 413 [of second recess portion 41]. *Id.*

145. Similarly, when the sliding component (elastic arm 3) is pulled back, the unlocking device 4 is unlocked and the elastic arm 3 slides backward along the sliding slot until it reaches a stopping device 5, and therefore the sliding slot has a **releasing position**. Ex. 1005, ¶[0026] (“After the unlocking device 4 is unlocked, the elastic arm 3 slides along the first recess portion 11 until it reaches the stopping device 5.”). In the releasing position, **protrusions 42 of the extending arms are disengaged from the first recess portions 41** provided on the sliding slots. *Id.*, ¶[0023]. Specifically, “[w]hen the elastic arm 3 is pulled to slide along the first recess portion 11, the protrusion 42 disengages from the second recess portion 41 via the first bent portion 421. Meanwhile, the push claw 425 is pulled out from the hollow portion 412, the push block 424 no longer abuts against the top contact portion 413, **the parallel portion 422 makes surface contact with the first recess portion 11 and slides along its track**, and the second bent portion 423 pushes away an elastic piece connected to a slot module (not shown) of the QSFP module interface device, allowing the QSFP module interface device to be smoothly unplugged.” *Id.* (emphasis added).

146. Because the sliding component (elastic arm 3) is pulled back towards the head part to release/disengage the QSFP module interface device from the slot/socket, the fastening position of the sliding component is farther away from the head part compared to the releasing position (which is closer to the head part because the sliding component is pulled back to release it from the slot/socket).

6. Claim term 7[b][3] (“wherein each extending arm has a limited part configured to move in the at least one limiting space;”)

147. Each extending arm of the sliding component (elastic arm 3) of Li’s QSFP module interface device includes a stopping device 5, which further includes a stopping member 51 (i.e., a “limited part”) extending from elastic arm 3. Ex. 1005, Fig. 3



Ex. 1005, Fig. 3 (annotations added)

148. The stopping member 51 (limited part) is a “stopping plate” and engages with the third recess portion 52 (the limiting space). Ex. 1005, ¶[0025]. Li additionally discloses that a return spring is disposed in the third recess portion 52 (the limiting space) between the stopping member 51 (limited part) and the side end of the third recess portion 52 opposite to the stopping member 51. *See id.*, ¶[0027]. “After the unlocking device 4 is unlocked, the elastic arm 3 slides along the first recess portion 11 until it reaches the stopping device 5.” *Id.*, ¶[0026]. A POSITA would have understood from the disclosures of Li that stopping member 51 (limited part) is

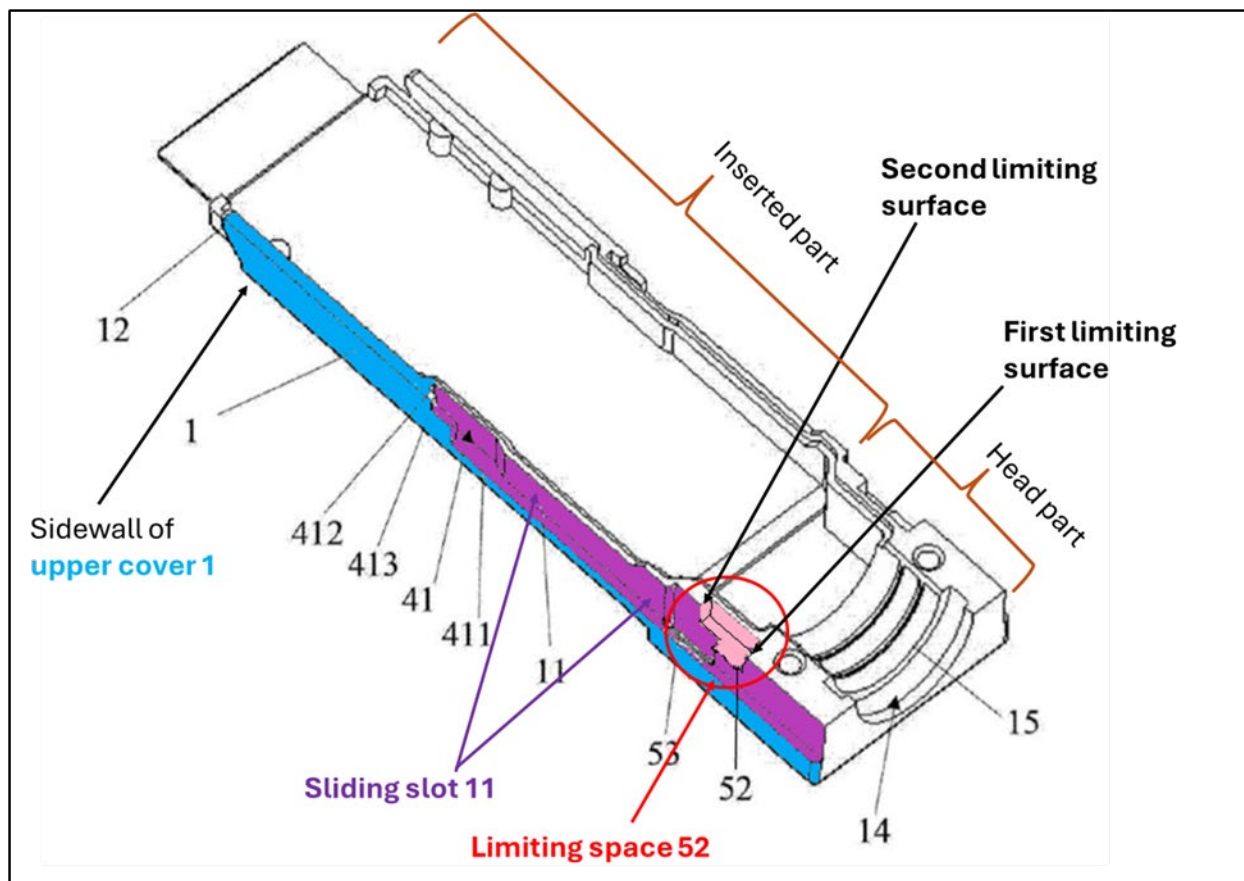
configured to move in the third recess portion 52 (limiting space) when elastic arm 3 (sliding component) is slid along first recess portion 11 (sliding slot) to achieve a fastening position and a releasing position. *Id.*, ¶[0025] (“stopping member 51 is engaged with the third recess portion 52, and the stopping member 51 is a stopping plate”), ¶[0026] (“After the unlocking device 4 is unlocked, the elastic arm 3 slides along the first recess portion 11 until it reaches the stopping device 5. Meanwhile, the third recess portion 52 forms a block against the side end of the stopping member 51, preventing the stopping member from moving.”).

7. **Claim term 7[c] (“an elastic component, wherein the main body has a first limiting surface and a second limiting surface forming the limiting space, the first limiting surface is closer to the head part than the second limiting surface, and the elastic component is located in the limiting space and between the first limiting surface and the limited part and is covered by the extending arm such that the elastic component is confined by the main body and the sliding component.”)**

149. Li discloses that a return spring device (i.e., an “elastic component”) is disposed in the third recess portion 52 (the limiting space) between the stopping member 51 (limited part) and the side end of the third recess portion 52 opposite to the stopping member 51. Ex. 1005, ¶[0027]. As discussed above, the third recess portion 52 (limiting space) is formed in the first recess portion 11 (sliding slot) on a side surface of the main body of the QSFP module interface device. *See* Section X.A.3. Although Li shows that the third recess portion 52 (limiting space) is formed

in the head part of the main body, a POSITA would have easily known and understood that the limiting space could have been positioned anywhere along the first recess portion 11 (sliding slot). As shown in Figure 5 below, there is plenty of space along sliding slot 11 to reposition limiting space 52 to a portion of the sliding slot that is in the inserted part of the main body. Indeed, positioning of the limiting space 52 anywhere along the sliding slot 11 is an obvious matter of design choice because there are no distinct advantages associated with placement of limiting space 52 in the inserted part versus the head part. Nowhere does the '826 patent disclose that the placement of the limiting space in the inserted part is critical, results in a difference in function, or achieves unexpected results. Accordingly, positioning of Li's limiting space 52 in the inserted part instead of the head part would have been an obvious design choice. For example, Mizue discloses a similar limiting space that is located on a side surface of the inserted part. *See* Section VIII.A.8. At a minimum, a POSITA would have understood that it would have been obvious to try and reposition Li's limiting space 52 to the inserted part to free up space along the width of the head part to accommodate more electronic components in that space, thus meeting the requirements of compactness and proper space utilization in the optical transceiver.

150. As shown below, the side surfaces of third recess portion 52 (limiting space) form first and second limiting surfaces. Ex. 1005, Fig. 5. When limiting space 52 is repositioned to a portion of the sliding slot that is in the inserted part of the main body, the first limiting surface is closer to the head part (portion that connects with an optical cable or electrical cable 7) than the second limiting surface. Ex. 1005, Figs. 4 and 5.



Ex. 1005, Fig. 4 (showing first and second limiting surfaces)

151. Li additionally discloses that the return spring (elastic component) is disposed in the third recess portion 52 (the limiting space) between the stopping member 51

(limited part) and a side end of the third recess portion 52 opposite to the stopping member 51. *See id.*, ¶[0027] (“The return spring device is a spring, **with one end abutting against the stopping member 51 and the other end abutting against the side end of the third recess portion 52 opposite to the stopping member 51.**”)

(emphasis added). Although Li does not explicitly disclose that the return spring is disposed between the stopping member 51 and the side surface closer to the head part (i.e., the first limiting surface), a POSITA would have understood that the return spring must be disposed between stopping member 51 and the first limiting surface to generate a rebound force under the action of the spring when the unlocking device 4 is unlocked and elastic arm 3 (sliding component) is slid backward towards the head part, thereby compressing the spring between the stopping member 51 and the first limiting surface. *See id.* That is, the elastic component (spring device) is confined or restricted longitudinally by the first limiting surface of the limiting space 52 and the limited part 51.

152. Additionally, as shown in Figures 1 and 2, the elastic component (spring device) is covered by the extending arm of the sliding component (elastic arm 3) such that the elastic component is confined by the main body and the sliding component. Specifically, the elastic component is housed in the third recess portion 52 (limiting space), which is a recessed region within first recess portion 11 (sliding

slot) of the main body, and Li discloses that elastic arm 3 (sliding component) slides along first recess portion 11. Ex. 1005, ¶[0022] (“The elastic arm 3 is engaged with the first recess portion 11 and capable of sliding along a track formed by the first recess portion 11”) and ¶[0025] (discussing that “a third recess portion 52 [is] recessed within the first recess portion 11”). Accordingly, a POSITA would have understood that the elastic component (spring device) would have been confined laterally by the sliding slot of the main body on one side and the extending arm on the other side and further confined longitudinally by the first limiting surface and the limited part 51. Ex. 1005, Figs. 1 and 2. That is, a POSITA would have understood that the elastic component is covered by the extending arm of the sliding component (elastic arm 3) and that the elastic component is confined, i.e., limited or restricted, by limiting space 52 in the sliding slot (first recess portion 11) of the main body and the sliding component. *Id.* That is, the elastic component is confined by the main body and the sliding component.

XI. CONCLUSION

153. For the reasons explained in detail above, every element of the Challenged Claims of the '826 patent is anticipated by Mizue (Ground 1) and rendered obvious by Li in view of Liu or Li alone (Grounds 2 and 3). Moreover, a POSITA would have been motivated to make the modifications and/or combinations discussed in Grounds 2 and 3; doing so would have required only routine engineering skill and

knowledge; and the modifications and/or combinations would have yielded predictable results.

154. Moreover, I am not aware of any secondary indicia of non-obviousness tied to the claimed invention that would alter my opinion that the Challenged Claims would have been obvious to a POSITA at the time of the effective filing date of the application leading to the '826 patent.

155. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct, that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: October 31, 2025

Respectfully Submitted,

By: _____



Michael Lebby, Ph.D.

EXHIBIT A

Michael Lebby



EDUCATION:

2004, Doctor of Engineering (D. Eng.)
University of Bradford, United Kingdom
Electrical and Electronic Engineering with citation, “*Technical Contributions to Optoelectronics*”
(NB: This is a higher doctorate awarded on technical contribution to the field)

1987, Ph.D.
University of Bradford, United Kingdom
Electrical and Electronic Engineering with thesis, “*Characterization and Fabrication of the HFET and BICFET*”

1985, MBA
University of Bradford, United Kingdom
Thesis, “*Small Business Planning for a Start-up*”

1984, Bachelors (B. Eng. – Honours)
University of Bradford, United Kingdom
Electrical and Electronic Engineering with thesis, “*Computer Aided Testing of Semiconductor Devices*”

SUMMARY OF TECHNICAL EXPERTISE:

Industry roles (majority of career): Dr. Lebby is currently Chair of the Corporate Engagement Council, and Board of Directors for Optica (2024-2026). Dr. Lebby was honored in October 2024 as ‘Photonics 100’ for 2025 by Electro Optics Publication. The award is based on exceptional contributions and achievements in the field of photonics. Dr. Lebby is also currently CEO of GenusTechnik Inc., a company that provides expert witness consulting services in patent/Intellectual Property litigations as well as consulting to technology companies. GenusTechnik Inc. has served many top-tier technology clients that include both \$B and \$T market capitalization companies as well as well-established international level law firms. Dr. Lebby recently (Dec 2024) retired as Chairman & CEO of a public company (Lightwave Logic Inc. NASDAQ:LWLG). As CEO, Dr. Lebby led LWLG from an OTCQB company to OTCQX, and then to up-list on NASDAQ, organically, without raising financing (which is extremely rare), on 1st September 2021. Subsequently, Dr. Lebby was invited to ‘ring the bell’ and close the NASDAQ stock market for the week on 10th September 2021. The event was carried live on Fox, CNBC, Bloomberg, and BNN networks. On 1st September 2022, Lebby was elected Chairman of Lightwave Logic Inc.

Industry roles for data center technology/applications over the past 30years in both multinational as well as SME companies:

Dr. Lebby has founded and led several SME companies that have served optical communications hardware for data center environments in various senior positions including CEO and CTO (Ignis Optics, Oculi, One Chip Photonics, OIDA, Translucent Photonics, and Lightwave Logic). Dr. Lebby has also held engineering positions for data

communications, data center applications, and high-performance computing with global multinational companies such as: Motorola, Tyco Electronics, Bookham, Intel, and AT&T Bell Laboratories.

SME (Small and medium enterprises) or start-ups

Ignis Optics was founded by Dr. Lebby and his colleagues to supply high speed data communications optical transceivers (i.e. data center hardware) into the data center environment and manufactured these products for data center use in racks that contained servers and switches. In his role as CEO, Dr. Lebby oversaw the technical design, specifications to standards, manufacturing, marketing and sales to data center customers.

Oculi is a consulting company founded by Dr. Lebby to provide technical consulting on hardware that is utilized in data center applications. Dr. Lebby consulted on technical optical and electronic component, package, module and sub-system designs that were utilized in data center applications.

One Chip Photonics is a company that designed, manufactured very high speed optical and electronic components for data center applications. These components included optical transceivers, electronic chips such as laser drivers, transimpedance amplifiers, multiplexors, photodetector circuits, as well as the packaging and module design. As CEO, Dr. Lebby oversaw the marketing, sales, and manufacturing of hardware component to the data center industry.

Lightwave Logic is a public company developing very high-speed optical and electronic hardware components for data center applications that address the rising needs of Generative Artificial Intelligence (G-AI).

OIDA (Optoelectronics Industry Development Association) is a trade association that Dr. Lebby became the head at CEO driving new technologies for data center applications. In this role, Dr. Lebby led workshops, conferences, publications for optoelectronic hardware technologies with use in data center environments. Typical hardware would include both electronic IC chips, lasers, photodetectors, and associated components for fiber optic interconnects, transceiver modules, printed circuit boards, line cards, as well as hardware technologies to support networks, servers, switches, fiber management architecture as examples.

Global multinational companies:

Dr. Lebby's role at Tyco Electronics involved the engineering design, product manufacturing of optoelectronics and fiber optic components that are normally utilized in data center applications. Further, as Tyco Electronics was the leading provider of fiber optic management systems for racks, servers, switches etc., that are utilized in data centers, Dr. Lebby was intimate with the B2B sales, marketing, reliability, design-in and qualification process with data center orientated customers of Tyco Electronics. At Tyco Electronics, Dr. lebby attended popular standards committee meetings to ensure Tyco Electronic products both met performance as well as standardized specifications needed for data center applications.

At Intel, Dr. Lebby led engineering design teams for hardware components that were designed for data center applications. Examples of these components include electronic ICs, multiplexors, fiber optic transceivers, integrated photonics, etc., as well as a variety of roles with Intel's private equity investment division that invested in numerous SMEs to develop new and innovative technologies for data center applications, high performance computing, as well as fiber optics communications in general. Dr. Lebby attended a number of standard committee meetings to make sure that hardware being designed at Intel met standards specifications and performance.

At Motorola, Dr. Lebby focused on optoelectronic hardware design for data center applications that ranged for example from electronic and photonic components to packaged modules, line cards, fiber optic connectors as well as fiber optic network systems. In his roles at Motorola, Dr. Lebby interfaced with customers, supply management teams and technical teams to provide manufactured product for data center applications that would normally be found in B2B services with customers. Further, Dr. Lebby led reliability and quality teams in engineering and drove high performance solutions that met common industry standards.

Bookham was a hardware company (now part of Lumentum Inc.) manufacturing data communication and telecommunication fiber optic components, modules, sub-systems for both high performance computing as well as data center applications. In his role at Bookham, Dr. Lebby both led engineering teams developing hardware such as fiber optic transceivers, as well as interfacing with customers, supply management teams, reliability and quality teams to enable sales of Bookham products in the data center application space.

At AT&T Bell Laboratories, Dr. Lebby created new technological platforms to design and fabricate integrated photonics and electronic components for data center applications. Focus was on electronic transistors, lasers, LEDs, optical switches, photodetectors, as well as simple electronic circuits.

Academia role (minor part of career): Dr. Lebby has been a full professor (part-time) in optoelectronics at Glyndŵr University, Wales, UK (2013-15). Dr. Lebby has over 60 publications and has a google scholar h-index = 47 (which includes issued patents and published patent applications), i10-index = 173, with over 9200 citations.

Key professional bodies: Dr. Lebby is a Fellow of the National Academy of Inventors (NAI), the IEEE (Institute of Electrical and Electronic Engineers), and Optica (previously: Optical Society of America). Dr. Lebby is a Chartered Engineer of the British Institute of Electrical Engineers (roughly equivalent to the professional engineer status in USA).

Dr. Lebby started work in telecommunications industry and has generated over 40 years of experience in a broad range of technical disciplines and technologies. Dr. Lebby is well versed in photonics, PICs (photonic integrated circuits), electronics, semiconductor physics, optoelectronics, optics, materials, temperature, and mechanical engineering in general. Dr. Lebby is also experienced in matters of semiconductor packaging, data center, data communications based pluggable transceiver module design, data center electrical interconnect and connectors, ICs (digital, analog, RF, power, compound semiconductor), lighting, LIDAR, applications of artificial intelligence, sensing, displays, and polymers in general. Dr. Lebby has experience in commercial and industrial research of technologies such as silicon, silicon photonics, silicon photonic PICs, compound semiconductors, GaAs PICs, InP PICs, electronics, connectors, manufacturing, fabrication, design, simulation, testing, evaluation, reliability, qualification of new ideas, concepts and products.

Dr. Lebby is co-inventor of the world's first 'oxide VCSEL' in 1991 (this is a type of semiconductor laser) for data center applications in both high-performance computing, data communications and telecommunications. The designs were called Optobus™ and were manufactured by Motorola to provide increase data flow in short distance fiber optic ribbon interconnects. Today, these types of fiber optic interconnects are utilized in data center applications to further increase data flow to help alleviate G-AI demands in the data center environment. Further, these high-performance laser arrays are now being utilized for consumer applications for structured sensing. One example is structured sensing in modern day smart phones, another example is the application of laser mice for PCs). US Patent #5359618 "High Efficiency VCSEL and Method of Fabrication" issued 25th October 1994. Estimated aggregated commercial volumes of this semiconductor device exceed many billions of units today where the data center environment is a major customer of VCSELs.

Dr. Lebby has over 230 issued utility patents with the USPTO in subjects such as electronics, optoelectronics, photonics, packaging, transceiver modules, LiDAR components/PICs, electrical and optical connectors, sensing components, optical sub-assemblies, materials, epitaxial growth, device design, assembly, and various active and passive components (both electronic and optoelectronic for the data communications, data center industry). Dr. Lebby has over 400 media events in which he has been a speaker (keynote, invited, contributed, webcasts, panels, interviews etc.), and regularly receives invites to speak at technical conferences as well as banking and financial conferences on subjects that range from optical networking for data communications, data center industry, internet, telecommunications, generative-artificial intelligence as part of the data center industry, semiconductor eco-systems, foundries, outsourced manufacturing, technology roadmaps, corporate leadership, bring a new technology platform to market, and finance issues for small and entrepreneurial companies. Dr. Lebby has appeared in panels and interviews many times and regularly is communicating with the public on various platforms both technically, as well as financially. Dr. Lebby is currently chairman of the International PIC conference based in Europe (since it's conception in 2015) which has as its focus PICs for data communications, high performance computing, and data center applications in all of these industries. Dr. Lebby has a combined total of over 335 USPTO issued utility patents and published patent applications. This number grows to over 500 if international derivatives are included.

Dr. Lebby has participated in over 180 patent litigation cases as a technical expert witness, including over 20 trials and over 60 depositions. Dr. Lebby has authored numerous expert reports and is familiar with State (District), Federal (ITC) and PTAB-IPR court processes for expert witness testimony. Dr. Lebby has been cited in patent litigation case history (ITC investigation in the matter of: Certain Active Optical Cables and Products Containing the Same (ITC Inv #337-TA-1233)). See details below in Expert Witness Experience.

The types of products that Dr. Lebby understands and includes but are not limited to; Light Emitting Diodes (LEDs), Laser Diodes (LDs), silicon photonics, PICs, InP PICs, GaAs PICs, photodetectors (PDs), optical waveguides, fiber optics, displays (LCD, LED, OLED), lighting luminaires, plastic photonics, optical polymers, connectors, sensors, LIDAR, solar cells, lighting, data communication, CMOS, and even new opportunities such as medical and life science applications for photonics. Many of the optical and electronic components designed and manufactured by Dr. Lebby were for the data communications, data center industry.

Dr. Lebby is internationally known for his work with integrated photonics, PICs (Photonic Integrated Circuits), silicon photonics, and semiconductor technologies such as InP, GaAs, III-N, GaN, silicon, as well as SiGe and silicon ICs (MOSFETs, FinFETs, bipolar), power FETs, RF FETs, various display technologies such as LCD, OLED, LED, cameras, as well as micro-fluidics and nanostructures/wires etc. Dr. Lebby has worked with DC current as well as AC current, high frequency design, microwave design, twisted wire pairs, and multi-wavelength, visible wavelengths, in addition to 850nm/1310nm/1500nm/NIR fiber optic communications. Dr. Lebby has worked extensively in fiber optics which includes Fiber based systems, chassis', trays, modules, adapters, splice devices,

Michael Lebby Curriculum Vitae (CV)

connectors (electrical and optical), transceivers, packaging as well as architecture and optical communication standards/protocols that include synchronous and asynchronous architectures. Fiber-optic based communications are indirectly impacted by generative-artificial intelligence (G-AI), as these systems carry the increase computational data load generated by G-AI electronics technology.

Dr. Lebby recently retired as Chairman and CEO of a public company (Lightwave Logic Inc. NASDAQ:LWLG). As CEO, Dr. Lebby took LWLG from an OTCQX company to up-list on NASDAQ, organically, without raising financing (which is extremely rare). LWLG was listed on NASDAQ 1st September 2021, and Dr. Lebby was invited to close the NASDAQ stock market on 10th September 2021 and “ring the bell”. The event was carried on Fox, CNBC, Bloomberg, and BNN networks.

Dr. Lebby was voted in 2023 to become chair of Optica’s Corporate Engagement Council (2024-2026) and become a member of the Optica Board of Directors. Dr. Lebby is currently a member of Optica’s Corporate Engagement Council which represents the global photonics industry and is a member of Optica’s Board of Directors (Jan 2024-Dec 2025).

BIOGRAPHY

Dr. Lebby (born 1961, London, UK) is an Anglo-American entrepreneur and intrapreneur in the fields of optoelectronics/photonics, electronics (lasers, LEDs, detectors, PICs, IC, RF, power, microwave etc.), and semiconductors in general and more specifically for the data center, data communications, and telecommunications industry. Dr. Lebby’s career started with the British Government in 1977 in telecommunications and he did research at their research labs (RSRE Malvern) in the early 1980s. Dr. Lebby worked at AT&T’s research labs: Bell Labs (1985-1989) in photonics, especially PICs, and subsequently drove the development (and co-authored the first patent) of the oxide VCSEL diode laser at Motorola in the 1990s (which is now used in laser mice, 3D structured light sensing in mobile phones, optical interconnects; where volumes of the laser are over 1B units today). From 2005-2010 he led the USA trade association in optoelectronics (OIDA) and represented the optoelectronics and photonics industry on Capitol Hill. In this role he produced broad market analysis in fiber optic communications, lighting, displays, automotive LIDAR, sensing, solar, photonics manufacturing, as well as associated technology roadmaps for the market verticals and technologies.

Dr. Lebby was a member of Lightwave Logic’s Board of Directors from 2015 to 2024. In May 2017, Dr. Lebby assumed the role of CEO, and in September 2022, Chairman and CEO of Lightwave Logic Inc (NASDAQ:LWLG) until 10th December 2024. Lightwave Logic is a technological company commercializing Electro-Optical polymers and successfully up listed the company to NASDAQ on 1st September, 2021. Dr. Lebby was invited to close the NASDAQ stock market on 10th September 2021. The event was carried on Fox, CNBC, Bloomberg, BNN networks.

Dr. Lebby has led and run technical start-ups and commercialized optoelectronic and photonics technology into volume manufacturing. He has also had roles as a venture capitalist specializing in optical communications, data center applications, high-performance computing, and data communications.

. He is currently a technical expert to the European Commission. He is a Fellow member of NAI (National Academy of Inventors), IEEE, and OSA, and has been voted PIC (Photonic Integrated Circuit) business leader of the year by the PIC International Conference in 2018.

Dr. Lebby holds over 500 issued international patents (as per search engine) in photonics and electronics, that have been derived from over 230 issued USPTO utility patents, mostly in the field of optoelectronics, photonics, and semiconductors. He has been cited by the USPTO to be in the most prolific 75 inventors in USA from 1988-1997.

Dr. Lebby is passionate about photonics and has focused his efforts over the last 30years to drive new photonics manufacturing programs in USA and Europe as well as industry-based photonics technology roadmaps that include data communications, data center applications, and high-performance computing as examples.

Dr. Lebby is also a keen hobbyist in optics and philately, and has been elected to both the London Guild of Spectacle Makers as well as the Royal Philatelic Society London.

WORK HISTORY:

2023 – Present

GenusTechnik Inc., CEO and CTO (part-time consulting)

Michael Lebby Curriculum Vitae (CV)

GenusTechnik Inc., provides consulting in expert witness, trial, deposition, expert reports, infringement, invalidity, and various patent and IP litigation in the general areas of photonics, optoelectronics, semiconductors, fiber optics communications, wireless, wireline, data center applications, high-performance computing, and data communications. GenusTechnik has engaged with patent agencies such as: IMS Expert Services, Thomson Reuters Expert Witness Services (now Round Table Group), LitXpert Expert Witness Group, Teklicon Expert Witness Agency, Beche Expert Services Group, Forensis Group: Expert Witness Services, and Expertconnect. GenusTechnik Inc. also provides consulting to Ambature Inc. in superconductivity with applications for data center cooling technology, semiconductors, as well as medical imaging.

2003 – 2022

Oculi LLC, CEO and CTO (part-time consulting)

Oculi LLC), provided consulting in expert witness, trial, deposition, expert reports, infringement, invalidity, for patent and IP litigation. Subjects included: photonics, optoelectronics, semiconductors, electronic transistors, electronic circuits, integrated circuits (ICs), displays, cameras, optics, lenses, packaging, and fiber optics for telecommunication technology in general. Oculi LLC provided consulting to Ambature Inc. in superconductivity with applications for data center cooling technology, semiconductors, as well as medical imaging.

2015 – 2024

Lightwave Logic (NASDAQ:LWLG), Chairman, CEO, & Director, Board of Directors

In 2015 Dr. Lebby became a director of Lightwave Logic to assist in the company for competitive optical modulator products and associated packaging, manufacturing, and technology roadmaps/marketing. Lightwave Logic is a public company developing very high-speed optical and electronic hardware components for data center applications that address the rising needs of Generative Artificial Intelligence (G-AI). In May 2017, Dr. Lebby became CEO of Lightwave Logic. On 1st September 2021, Dr. Lebby successfully guided Lightwave Logic to up-list to NASDAQ, and was invited to ring the closing bell on 10th September 2021. The NASDAQ up-list was organic i.e. no reverse split, no raised funds. The organic up-list is considered very rare in the financial industry. In September 2022, Lebby became Chairman and CEO of Lightwave Logic Inc. Dr. Lebby retired from Lightwave Logic in December 2024.

2014 – 2016

University Southern California, Director CFR (Corp & Foundation Relations)

Dr. Lebby assisted USC Viterbi Engineering to foster tighter faculty-industry relationships in high technology, IT, social media, graphic arts, electronics, photonics (solar, display, medical), fiber communications segments, wireless, wireline, data center applications, high-performance computing, and data communications.

2013 – Present

European Commission, Technical Expert

In 2013 Dr. Lebby became a technical expert for the Photonics Unit of the European Commission. Dr. Lebby has participated in organizing workshops, lectures, evaluating photonics proposals, and advising the Commission on funded projects. Dr. Lebby currently is an advisor on a number of photonics and PIC based pilot lines (MIRPHAB, PI-SCALE, PIX4LIFE, PIXAPP, InPULSE, Phabulous, PhotonHub) and photonics based cardiovascular disease programs (CARDIS and InSide) as well as LIDAR/RADAR programs (Coralidar and Retina). More recently, Dr. Lebby has been consulting on larger framework (multi-country) projects that include electronics (power/RF) as well as photonic PIC based technologies and associated fabrication techniques (photolithography, etching, dielectrics, metallization etc.) that have applications with data centers and high-performance computing. Work includes displays, LEDs, lighting/LED luminaires, OLEDs, LIDAR, automotive, G-AI applications, micro-optics, optics, optical lenses, electrical and electronic

Michael Lebby Curriculum Vitae (CV)

ICs, packages and connectors, InP/Silicon PIC based photonics, near infra-red technologies (including PICs), fiber optics that includes transceivers, optical networking, as well as synchronous and asynchronous architectures, sensing, medical photonics, and medical imaging, technology roadmapping, electronics, electrical interconnects/connectors, IC design, RF electronics, Power electronics, microwave, acoustic and optical filters fiber optics communications, wireless, wireline, data center applications, high-performance computing, and data communications.

2013 – 2015 **OneChip Photonics Corporation, President and CEO**

In 2008 Dr. Lebby was elected independent board member for One Chip Photonics Inc. He was elected CEO in 2013. One Chip Photonics focused on technical and business operational strategy for advanced circuit based InP Photonic Integrated Circuit (PIC) and optoelectronic Integrated Circuit (OEIC) platforms that were specified for fiber optics communications, data center applications, high-performance computing, and data communications.

2013 – 2015 **Glyndŵr University, Professor, Chair of Optoelectronics**

In 2013 Dr. Lebby became full Professor of Optoelectronics (part-time) to assist Glyndwr University to position itself as a leader in semiconductors, optoelectronics and photonics, data center components, fiber optics communications, high-performance computing, and data communications.. Areas of focus include data center hardware components such as photonic integrated circuits (PICs) and optoelectronics integrated circuits (OEICs) as well as design, simulation, and testing of laser diodes, displays, optics, and solar cells.

2010 – 2013 **Translucent, Inc., GM and CTO**

Dr. Lebby positioned Translucent on the product development and manufacture of epitaxial semiconductor wafers for the solar, power and lighting industries. Dr. Lebby led the R&D and development of MBE based rare earth oxide single crystal epitaxial layers deposited onto large silicon wafers. On top of these wafers both MBE and MOCVD Gallium Nitride (GaN, III-Nitride) epitaxial device layers were grown for devices and PIC solutions using novel fabrication techniques and electrode and contact formation. The use of GaN-on-Si is expected to be a strong catalyst for change in the power electronics and LED lighting industries. In a parallel program at Translucent, Dr. Lebby led the development efforts to develop and productize Germanium-Tin (GeSn) template wafers onto large format silicon wafers (Ge-on-Si) to enable cost effective, and ultra-high efficiency multi-junction solar cells for the CPV industry. Dr. Lebby also led the team to develop high performance GaN transistors and FETs for applications with high power, high frequency, electrically powered products that included automotive, data centers, and consumer products. Areas of advanced interconnect using new and novel material compounds were explored that focused on lighting, sensing, biomedical, RF electronics, Power electronics, solar, fiber optic communications, RF filters, ICs etc.

2005 – 2010 **OIDA (Optoelectronic Industry Development Association), Executive Director, President, and CEO (Board Member)**

Dr. Lebby represented the optoelectronics industry and organized technical conferences/workshops/forecasts with industry roadmaps. Initiated green photonics metrics. Dr. Lebby positioned OIDA as a national resource in the field of optoelectronics and has represented industry in many capacities ranging from talks, papers, expert witness, testimony, market and technical reports. Dr. Lebby created **new industry-based initiatives** in fiber optics broadband, fiber optic communications, data center applications, data communications as well as the green photonics movement (solar technologies, displays, LED lighting technologies, automotive) that is now occurring globally. Parts of the roadmap included various applications for PIC based photonic technologies for data communications, high performance computing and data center applications.

2003 – 2005 **OCLARO (after acquisition of Bookham in 2003), VP Technology and Business Development**

Michael Lebby Curriculum Vitae (CV)

Design and manufacture of data center, data communications, high-performance computing, telecommunication hardware components based on optoelectronics and electronics semiconductors as well as a broad portfolio of components, modules, sub-systems, line cards for communications in general. San Jose, Ca. Focus on technology data center, high-performance computing, data communications strategy for components and sub-systems that included InP based PICs.

2001– 2003

Ignis Optics, President and CEO (Founder/Board Member)

Venture-backed start-up, San Jose, California manufacturing 10Gbps and OC192/OC48 fiber optic transceivers with micro-controllers using the XFP form-factor to support the growing data center and high-performance computing industry.

1999 – 2001

Intel Capital, Director Business Development/Investor (w/Board observer positions on Investment)

Intel Capital, Santa Clara, California. In 1999, Dr. Lebby joined Intel as a corporate investor and was responsible for sourcing, negotiating, and closing private placement equity deals in the optical networking, data center applications, high performance computing, and data communications industry.

component, display, projection technologies, LED lighting, LED luminaires, and silicon, silicon photonics/PIC semiconductor arenas.

1998 – 1999

TE Connectivity (renamed from AMP, then Tyco Electronics), Director Technology & Business Development (Fiber Optics)

Global Optoelectronics Division: Technology strategy for optical communications products that included electrical and optical interconnects, electrical and optical connectors (RJ, MT, LC etc.), for backplane, cabinet, switching, network management systems for the growth of data centers, high performance computing applications products, and data communications hardware in general.

1989 – 1998

Motorola, R&D Manager

Corporate R&D Labs, Tempe, Arizona. Focus on semiconductors, semiconductor fabrication techniques (metallization, etching, photolithography, dielectrics). Optoelectronics: VCSEL based product solutions (OPTOBUS); materials, devices, packaging, systems. Other technologies included displays, field emission, LED, LCD, OLED, virtual/micro and projection. At the time, Dr. Lebby was also the lead inventor in Motorola's history with over 150 issued utility patents. Dr. Lebby worked in the silicon and compound semiconductor fabrication plants (fabs) to become proficient in deposition/etching/alignment tooling as well as design and simulation. Many of the component technologies that were researched at Motorola can now be found in AR, VR, displays, automotive LIDAR, solar, sensing, consumer products such as mobile phones, as well as traditional electronics industries that include both InP, GaAs, GaN, and silicon photonics-based data center specified PICs. Work included optical networking with both electronics as well as optoelectronics synchronous and asynchronous architectures as well as electronic and optical interconnects with both electrical and optical connectors. Both wireline (twisted wire pair, fiber optics) as well as wireless (RF, microwave, optical) interconnects were utilized for a number of applications for high performance computing, data center interconnects, and data communications.

1985 – 1989

AT&T, Researcher

Michael Lebby Curriculum Vitae (CV)

AT&T Bell Labs - Photonics Research Dept (Dept 11366), Holmdel, NJ. Dr. Lebby designed and fabricated new GaAs and InP optoelectronic and electronic devices that were grown both by MOCVD and MBE for projects that included optical computing, fiber optic communications, high-performance computing as well as other computing applications that were focused on PIC based solutions. Work involved the fabrication of electrodes, contacts, etching, dielectrics, photolithography etc.

1977 – 1984

UK Ministry of Defense, Apprenticeship/Journeyman + Electronics Engineer (REME – Royal Electrical and Mechanical Engineers, and RSRE – Royal Signals and Radar Establishment)

Dr. Lebby started his career at the Royal Electrical and Mechanical Engineer (REME) division of the Ministry of Defence in the UK. Lebby was a telecommunications apprentice and repaired all types of radio/RF/UHF communications equipment that included electrical connections, connectors, and circuits. Equipment included both wireless communications as well as telecommunications electronics switching systems for traditional wireline calls. Lebby qualified as a fully qualified Apprentice (or Journeyman) specializing in electronic copper based telecommunications, and early high performance computing approaches in 1980. Dr. Lebby moved to the Royal Signal and Radar Establishment (RSRE) to study material, fabrication and characterization issues of GaAs and InP semiconductor devices and high frequency/ultra-high frequency wireline and wireless communications.

SELECTED PROFESSIONAL ACTIVITIES & AWARDS:

- Nominated for the Photonics 100 for 2025 by Electro Optics Publication October 2024. The award is based on exceptional contributions and achievements in the field of photonics as well a level of dedication and innovation that continues to inspire and advance the photonics industry.
- Elected Chairman of Lightwave Logic Inc., NASDAQ:LWLG 1st September 2022 until retiring in December 2024.
- Elected to the Corporate Engagement Council (newly formed OIDA to represent the global optical industry) for Optica in June 2022 and voted to become Chairman for 2024-2026 that is represented on Optica's Board of Directors.
- Invited to ring the closing bell of NASDAQ (with associated TV interviews) on 10th September, 2021
- Elected Fellow of the **National Academy of Inventors (NAI)** in 2020.
- Voted winner at the PIC Conference (Photonic Integrated Circuits) as PIC **Entrepreneur and Business Leader of the Year** (March 2018).
- Dr. Lebby is **co-inventor of the oxide VCSEL** (semiconductor laser) that is now being utilized for consumer applications (*structured sensing in smart mobile phones*). US Patent #5359618 "High Efficiency VCSEL and Method of Fabrication" issued 25th October 1994.
- Dr. Lebby was recognized professionally as a **Fellow of IEEE (2005) and OSA (2007)** with his technical contributions to the field of optoelectronics.
- Dr. Lebby is a member of the Fellows review committee of IEEE.
- As an inventor Dr. Lebby has achieved **over 230 issued utility patents with the USPTO**.
- As an inventor Dr. Lebby has ~80 published utility patent applications with the USPTO
- As an inventor Dr. Lebby has **over 500 issued patents** world-wide if international derivatives are counted.
- Dr. Lebby's novel laser-based device, packaging, modules designs led Motorola to sell their patent portfolio independently where a number of the patents have "very high licensing coefficients." Dr. Lebby was given a special award from the Chairman of Motorola for exemplary patent invention accomplishments in 1998 and # **1 prolific inventor in Motorola's history** with the majority of work focused for data center applications, high performance computing, and data communications.
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- **Over 60 publications** (www.linkedin.com/in/lebbby)
- **Over 400 public media activities** (that include: Books, Chapters, Reports, Abstracts, Videos, Lectures, Speeches, Reviews, Courses, Talks, Invited Talks, Keynote Talks, Plenary Talks, Webinars, Interviews, Articles, etc.). See at www.linkedin.com/in/lebbby
- Author of OIDA's **annual market optoelectronics report** and forecast (2009 version is over 600 pages), which receives international exposure and recognition. Regularly interacts with government agencies in Washington DC on photonics-based projects (DARPA, ARPA-E, NIH, NSF, DOE, NIST, DoD etc.). Typical

chapters included: LEDs, laser diodes, fiber optic communications, data center applications, high performance computing, sensors, displays, solar, green photonics, military photonics, automotive LIDAR, medical, biomedical, lighting (LED, OLED), displays (LCD, OLED) and applications of photonics and electronics that include RF/power/compound semiconductor, ICs, and associated components.

- Is the recipient of a **2nd doctorate** (higher) from Bradford University, UK, and only the second in the universities history to receive a D.Eng from industry (rest being academia).
- **Entrepreneur** at: (i) Motorola: Co-founded Optobus division – VCSEL laser based parallel optical interconnect solution, and (ii) Intel: Co-founded the Intel optics division for silicon photonics where over \$300M was initially invested for the division for data center applications, high performance computing, and data communications.
- **Entrepreneur**: Founded (and CEO) Ignis Optics Inc., a venture backed company (>\$30M) that designed and manufactured 10Gbps fiber optic transceivers. Sold the company to Bookham (NASDAQ: BKH) in 2003. Restructured OneChip Photonics (as CEO) through bankruptcy, and new VC-based funding. Assisted in the raising of >\$50M VC funding as a member of BoD. Founded Oculi LLC and Obsidian Motors LLC.
- IEEE CPMT **Board of Governors** ('98- '02); IEEE Phoenix Waves and Devices Junior Engineer of the Year (1993); CPMT Distinguished lecturer (2000), CPMT technical committee (TC-10 & ECTC) 1991 to 2011
- Advised at **Board of Director** level for a number of technical start-ups
- **Chartered Engineer** (C.Eng) from IEE (UK). The chartered engineering status is equivalent to the US PE (professional engineer)

EXPERT WITNESS EXPERIENCE

Summary:

Depositions (total-to-date) >60

Trial/Hearing/court/PTAB appearances >20 (with IPR/PTAB ‘paper trial’, this total increases to >40)

Cited patent litigation case history: In essence, the following case history means that the expert doesn’t have to disclose every minute detail in his expert report. He is allowed to disclose theories in the report and expand on them in his witness statement.

See also In The Matter Of Certain Light-Emitting Diode Products, Systems, And Components Thereof, Inv. No. 337-TA-1168, Order No. 34, 2020 WL 1026335 (Feb. 14, 2020) (denying motion *in limine* to preclude testimony where: “[t]he invalidity theories at issue were previously disclosed at least in Dr. Lebby’s expert report, and LSG had the opportunity to test these theories at Dr. Lebby’s deposition.”)

See case # 81 below

Patent litigation cases engaged:

1. Active case work: 1Q2009 (March 24th 2009); *Testimony: US-China Economic and security review commission on the optoelectronics industry. US Congress, Capitol Hill*; Written statement on the status of the USA optoelectronics industry with aural cross-examination by the commission. Trial experience.
 - a. Deposition: 0 (Cumulative total: 0)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 1)
 - i. ITC trial appearance: 0 (Cumulative total: 0)
 - ii. District Court trial appearance: 0 (Cumulative total: 0)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 0)
 - c. Technology: Optoelectronics (optical storage, fiber optic communications, sensors, high power lasers, LED lighting, LED luminaires etc.).
2. Active case work: 3Q2010-1Q2011; *Finisar Corp. v. Optical Communication Products Inc.*, No. 10-CV-05617 and No. 11-cv-00104 (retained by plaintiff - Morgan, Lewis & Bockius LLP).
 - a. Deposition: 0 (Cumulative total: 0)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 1)
 - i. ITC trial appearance: 0 (Cumulative total: 0)
 - ii. District Court trial appearance: 0 (Cumulative total: 0)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 0)
 - c. Technology: semiconductor lasers/VCSELs, fiber optic transceiver modules
3. Active case work: 1Q2011; *Ziptronix, Inc. v. OmniVision Technologies, Inc., Taiwan Semiconductor Manufacturing Company Ltd., and TSMC North America Corp.*, No. 11-CV-5235 (retained by plaintiff – Alston Bird LLP).
 - a. Deposition: 0 (Cumulative total: 0)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 1)
 - i. ITC trial appearance: 0 (Cumulative total: 0)
 - ii. District Court trial appearance: 0 (Cumulative total: 0)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 0)
 - c. Technology: CMOS image sensors; design and fabrication
4. Active case work: 3Q2011 to 3Q2012; *Certain Light-Emitting Diodes and Products Containing Same*, Inv. No. 337-TA-798 (USITC filed July 15, 2011), LG and Samsung v. Osram (retained by respondent Samsung – Covington & Burling LLP). Deposition (x2) and trial experience.
 - a. Deposition: 3 (Cumulative total: 3)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 2)
 - i. ITC trial appearance: 1 (Cumulative total: 1)
 - ii. District Court trial appearance: 0 (Cumulative total: 0)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 0)
 - c. Technology: LEDs, device design, color gamut, packaging, optical lensing, lead frames, surface mount packaging.
5. Active case work: 3Q2011 to 2Q2015; *Cheetah Omni, LLC v. Alcatel-Lucent USA Inc.*, No. 11-CV-390 (E.D. Tex. filed July 29, 2011) (retained by plaintiff – Brooks Kushman). Deposition experience (x2).
 - a. Deposition: 1 (Cumulative total: 4)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 2)

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- i. ITC trial appearance: 0 (Cumulative total: 1)
 - ii. District Court trial appearance: 0 (Cumulative total: 0)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 0)
 - c. Technology: Fiber optic networks, optical switches, ROADMs and optical filters (dielectric based).
6. Active case work: 4Q2012 to 3Q2014; *Finisar Corp. v. Cheetah Omni, LLC*, No. 11-CV-15625 (E.D. Mich. filed Dec. 23, 2011) (retained by defendant – Brooks Kushman). Deposition experience (x1).
 - a. Deposition: 1 (Cumulative total: 5)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 2)
 - i. ITC trial appearance: 0 (Cumulative total: 1)
 - ii. District Court trial appearance: 0 (Cumulative total: 0)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 0)
 - c. Technology: Wavelength optical switches, optical filters, and optical components, liquid crystal technology.
7. Active case work: 4Q2012 to 3Q2013; *Certain Optoelectronic Devices for Fiber Optic Communications, Components Thereof, and Prods. Containing the Same*, Inv. No. 337-TA-860 (USITC filed Sept. 24, 2012) (retained by respondent – Mellanox, IPtronics and FCI Inc and counsel Alston & Bird LLP). Deposition (x2) and trial experience.
 - a. Deposition: 2 (Cumulative total: 7)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 3)
 - i. ITC trial appearance: 1 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 0)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 0)
 - c. Technology: IC design, layout, and operation; especially laser driver chips for VCSELs. High speed laboratory testing.
8. Active case work: 3Q2014 to 2Q2015; *Microscan Sys., Inc. v. Cognex Corp.*, No. 14-CV-6952 (S.D.N.Y. filed Aug. 27, 2014) (retained by plaintiff – Morrison & Foerster LLP). Deposition (x1) and trial experience.
 - a. Deposition: 1 (Cumulative total: 8)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 4)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 1 (Cumulative total: 1)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 0)
 - c. Technology: Bar code scanners and associated optics such as imagers, lasers, LEDs, molded optics. Laboratory testing.
9. Active case work: 2Q2014 to 1Q2016; *Avago Techs. Fiber IP (Singapore) PTE Ltd. v. IPtronics Inc.*, No. 10-CV-2863 (N.D. Cal. filed June 29, 2010) (retained by respondent – Alston & Bird LLP).
 - a. Deposition: 0 (Cumulative total: 8)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 4)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 1)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 0)
 - c. Technology: IC design, layout, and operation; especially laser driver chips for VCSELs. High speed laboratory testing.
10. Active case work: 1Q2015 to 3Q2015; *Regarding certain optical disc drives*, Inv. No. 337-TA-897 (USITC filed Oct. 21, 2013) (retained by respondent – O'Melveny & Myers LLP).
 - a. Deposition: 0 (Cumulative total: 8)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 4)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 1)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 0)
 - c. Technology: CD, CVD, BluRay optical disk drives, optical components, laser diodes, and optical beam patterns. Laboratory testing of visible optics.
11. Active case work: 1Q2015 to 2Q2015; *BMW of N. Am., LLC v. Innovative Display Techs., LLC*, No. IPR2015-00933, IPR2015-00934 (P.T.A.B. filed Mar. 24, 2015) (retained by plaintiff – Crowell Moring LLP).
 - a. Deposition: 0 (Cumulative total: 8)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 4)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 1)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 0)
 - c. Technology: LED backlights for vehicles; LED package and optical module/LED luminaire design.
12. Active case work: 1Q2015 to 2Q2015; *BMW of N. Am., LLC v. Innovative Display Techs., LLC*, No. IPR2015-00934 (P.T.A.B. filed Mar. 24, 2015) (retained by plaintiff – Crowell Moring LLP).
 - a. Deposition: 0 (Cumulative total: 8)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 4)
 - i. ITC trial appearance: 0 (Cumulative total: 2)

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- ii. District Court trial appearance: 0 (Cumulative total: 1)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 0)
 - c. Technology: LED backlights for vehicles; LED package and optical module/luminaire design.
- 13. Active case work: 1Q2015 to 3Q2016; *OneChip Photonics Inc.*, Pre-litigation IP Case No. TBD; (retained by plaintiff – Patent Monetization Inc. (PMI)).
 - a. Deposition: 0 (Cumulative total: 8)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 4)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 1)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 0)
 - c. Technology: Photonic Integrated Circuits using InP (Indium Phosphide); lasers, detectors, waveguides, mux/demux, spot size converters.
- 14. Active case work: 2Q2016; *IDT v. Hyundai Motor Co.*, No. 14-CV-201 (E.D. Tex. filed May 4, 2015) (retained by defendant – DLA Piper LLP).
 - a. Deposition: 0 (Cumulative total: 8)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 4)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 1)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 0)
 - c. Technology: LED devices, packages and modules/luminaires for vehicles.
- 15. Active case work: 1Q2015 to 3Q2015; *Cree Inc. v. Honeywell Int'l Inc.*, No. 3:14-CV-737 (W.D. Wisc. filed Oct. 28, 2014) (retained by defendant - Arnold & Porter LLP). Deposition experience (x1).
 - a. Deposition: 1 (Cumulative total: 9)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 4)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 1)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 0)
 - c. Technology: LEDs for mobile phones; LED epitaxial layers, device designs, optical lensing, packaging. Laboratory reverse engineering using TEM/SEM/EDAX etc.
- 16. Active case work: 2Q2015 to 4Q2015; *Trs. of Boston Univ. v. Everlight Elecs. Co.*, Nos. 12-CV-11935, 12-CV-12326, 12-CV-12330 (D. Mass. filed Oct. 17, 2012) (retained by plaintiff - Shore Chan DePumpo LLP). Deposition (x1) and trial experience.
 - a. Deposition: 1 (Cumulative total: 10)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 5)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 1 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 0)
 - c. Technology: GaN buffer layers for LEDs, and associated technical marketing, sales and import process into USA.
- 17. Active case work: 3Q2015 to 3Q2016; *LG Elecs. Inc. v. Toshiba Samsung Storage Tech. Corp.*, No. 12-CV-1063 (D. Del. filed Aug. 22, 2012) and IPR2015-01659 (PTAB filed Jul. 31st 2015) (retained by plaintiff – DLA Piper & Nixon Law). IPR deposition (i.e. trial) experience (x1).
 - a. Deposition: 1 (Cumulative total: 11)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 6)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 1 (Cumulative total: 1)
 - c. Technology: Optical storage using laser diodes, photodetectors and optical materials
- 18. Active case work: 3Q2015 to 3Q2016; *LG Elecs. Inc. v. Toshiba Samsung Storage Tech. Corp.*, No. 12-CV-1063 (D. Del. filed Aug. 22, 2012) and IPR2015-01642 (PTAB filed Jul. 30th 2015) (retained by plaintiff – DLA Piper & Nixon Law).
 - a. Deposition: 0 (Cumulative total: 11)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 6)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 1)
 - c. IPR/PTAB trial/deposition: 0 (Cumulative total: 1)
 - d. Technology: Optical storage using laser diodes, photodetectors and optical materials
- 19. Active case work: 3Q2015 to 3Q2016; *LG Elecs. Inc. v. Toshiba Samsung Storage Tech Corp.*, IPR2016-01677 (PTAB filed Aug. 24th 2016) (retained by plaintiff – DLA Piper & Nixon Law).
 - a. Deposition: 0 (Cumulative total: 11)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 6)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)

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- iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 1)
- c. Technology: Optical storage using laser diodes, photodetectors and optical materials
- 20. Active case work: 3Q2015 to 3Q2016; *LG Elecs. Inc. v. Toshiba Samsung Storage Tech. Corp.*, IPR2015-01678 (PTAB filed Aug. 24th 2016) (retained by plaintiff – DLA Piper & Nixon Law).
 - a. Deposition: 0 (Cumulative total: 11)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 6)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 1)
 - c. Technology: Optical storage using laser diodes, photodetectors and optical materials
- 21. Active case work: 3Q2015 to 3Q2016; *LG Elecs. Inc. v. Toshiba Samsung Storage Tech. Corp.*, IPR2015-01644 (PTAB filed Jul. 30th 2015) (retained by plaintiff – DLA Piper & Nixon Law).
 - a. Deposition: 0 (Cumulative total: 11)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 6)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 1)
 - c. Technology: Optical storage using laser diodes, photodetectors and optical materials
- 22. Active case work: 3Q2015 to 3Q2016; *LG Elecs. Inc. v. Toshiba Samsung Storage Tech. Corp.*, IPR2015-01653 (PTAB filed Jul. 31st 2015) (retained by plaintiff – DLA Piper & Nixon Law).
 - a. Deposition: 0 (Cumulative total: 11)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 6)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 1)
 - c. Technology: Optical storage using laser diodes, photodetectors and optical materials
- 23. Active case work: 3Q2015; *Heptagon* Pre-litigation IPR petition; (retained by plaintiff – Proskauer Rose LLP).
 - a. Deposition: 0 (Cumulative total: 11)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 6)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 1)
 - c. Technology: Proximity sensors using LEDs, photodetectors and innovative semiconductor packaging.
- 24. Active case work: 1Q2016 to 2Q2017; *Dentsply v. Am. Orthodontics Inc.*, No. 15-CV-1706 (D. Pa. filed Sept. 1, 2015) and IPR2016-01652 (PTAB filed Aug. 19th 2016) (retained by defendant – Godfrey Kahn LLP). IPR deposition (x1) experience.
 - a. Deposition: 1 (Cumulative total: 12)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 7)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 1 (Cumulative total: 2)
 - c. Technology: High power lasers (YAG, CO₂) to engrave and scribe dental orthodontic brackets.
- 25. Active case work: 2Q2016 to 2Q2017; *Koninklijke Philips N.V. v. Elect-tech Int'l (H.K.)*, No. 14-CV-2737 (N.D. Cal. filed Aug. 12, 2015) (retained by plaintiff – Reed Smith LLP).
 - a. Deposition: 0 (Cumulative total: 12)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 7)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 2)
 - c. Technology: Trade secret and misappropriation of trade secrets for: MOCVD epitaxial growth techniques for high power GaN/InGaN LED technology, luminaires, modules and packaging.
- 26. Active case work: 2Q2016 to 4Q2016; *Bluestone Innovations llc. v. E. Mishan & Co. Inc.*, Pre-litigation IP Case No. TBD; (retained by defendant - Notaro, Michalos, & Zaccaria P.C.).
 - a. Deposition: 0 (Cumulative total: 12)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 7)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 2)
 - c. Technology: GaN/InGaN LEDs on structured substrates with reverse engineering laboratory analysis.
- 27. Active case work: 3Q2016-1Q2017; *511 Innovations Inc. v. HTC Am., Inc.*, No. 15-CV-1524 (E.D. Tex. Filed June 30, 2016) (retained by plaintiff – The Davis Firm). Deposition (x2)
 - a. Deposition: 2 (Cumulative total: 14)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 7)
 - i. ITC trial appearance: 0 (Cumulative total: 2)

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- ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 2)
 - c. Technology: Proximity sensors for mobile phones.
- 28. Active case work: 3Q2016-4Q2016; *Mellanox Techs. Ltd. v. Methode Elecs. Inc.*, No. 15-CV-3730 (N.D. Cal. filed Aug. 16, 2015) (retained by plaintiff – Alston & Bird).
 - a. Deposition: 0 (Cumulative total: 14)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 7)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 2)
 - c. Technology: Fiber optic transceiver modules.
- 29. Active case work: 4Q2016-1Q2017; *Novanta Inc., v. Iridium Inc.*, No. 15-CV-01033 (D. Del. filed Nov. 9, 2015) (retained by defendant – Barnes and Thornburg LLP).
 - a. Deposition: 0 (Cumulative total: 14)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 7)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 2)
 - c. Technology: High power gas laser design and operation.
- 30. Active case work: 1Q2017-1Q2017; *Optolium Inc., v. Cree Inc.*, No. 16-CV-03828; (D. Az. filed Nov. 3, 2016) (retained by defendant – Jones Day).
 - a. Deposition: 0 (Cumulative total: 14)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 7)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 2)
 - c. Technology: LED packaging for illumination. LED luminaires.
- 31. Active case work: 1Q2017-4Q2017; *Polygroup Macau Ltd (BVI), v. Willis Electric Co., Ltd.*, 15-CV-00552 (W.D. NC. Filed: Apr 21st 2016), (retained by plaintiff - Troutman Sanders LLP). Deposition experience (x2)
 - a. Deposition: 2 (Cumulative total: 16)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 8)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 1 (Cumulative total: 3)
 - c. Technology: Electrical connector, IC, and LED light product design including luminaires.
- 32. Active case work: 1Q2017-4Q2017; *Polygroup Macau Ltd (BVI), v. Willis Electric Co., Ltd.*, IPR2017-00309 (PTAB filed Nov. 21st 2017), (retained by plaintiff - Troutman Sanders LLP).
 - a. Deposition: 0 (Cumulative total: 16)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 8)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Electrical connector, IC, and LED light product design including luminaires.
- 33. Active case work: 1Q2017-4Q2017; *Polygroup Macau Ltd (BVI), v. Willis Electric Co., Ltd.*, IPR2017-00330 (PTAB filed Nov. 24th 2017), (retained by plaintiff - Troutman Sanders LLP).
 - a. Deposition: 0 (Cumulative total: 16)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 8)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Electrical connector, IC, and LED light product design including luminaires.
- 34. Active case work: 1Q2017-4Q2017; *Polygroup Macau Ltd (BVI), v. Willis Electric Co., Ltd.*, IPR2017-00331 (PTAB filed Nov. 24th 2017), (retained by plaintiff - Troutman Sanders LLP).
 - a. Deposition: 0 (Cumulative total: 16)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 8)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Electrical connector, IC, and LED light product design including luminaires.
- 35. Active case work: 1Q2017-4Q2017; *Polygroup Macau Ltd (BVI), v. Willis Electric Co., Ltd.*, IPR2017-00332 (PTAB filed Nov. 25th 2017), (retained by plaintiff - Troutman Sanders LLP).
 - a. Deposition: 0 (Cumulative total: 16)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 8)
 - i. ITC trial appearance: 0 (Cumulative total: 2)

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- ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Electrical connector, IC, and LED light product design including luminaires.
- 36. Active case work: 1Q2017-4Q2017; *Polygroup Macau Ltd (BVI), v Willis Electric Co., Ltd.*, IPR2017-00334 (PTAB filed Nov. 25th 2017), (retained by plaintiff - Troutman Sanders LLP).
 - a. Deposition: 0 (Cumulative total: 16)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 8)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Electrical connector, IC, and LED light product design including luminaires.
- 37. Active case work: 1Q2017-4Q2017; *Polygroup Macau Ltd (BVI), v Willis Electric Co., Ltd.*, IPR2017-00335 (PTAB filed Nov. 25th 2017), (retained by plaintiff - Troutman Sanders LLP).
 - a. Deposition: 0 (Cumulative total: 16)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 8)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Electrical connector, IC, and LED light product design including luminaires.
- 38. Active case work: 1Q2017-4Q2017; *Macom Technology Solutions Holdings Inc., and Nitronex, LLC., v. Infineon Technologies AG and Infineon Technologies North American Corp.*, 16-CV-02859 (C.D. Ca. filed Apr 26, 2016) (retained by plaintiff – Baker Botts LLP).
 - a. Deposition: 0 (Cumulative total: 16)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 8)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: High performance GaN based RF FET device design and operation.
- 39. Active case work: 1Q2017-1Q2017; *Quanergy Systems, Inc. v. Velodyne LiDAR, Inc.* (16-cv-05251; N.D. Ca. filed: Sep 13th 2016 (retained by plaintiff Velodyne) - Latham & Watkins LLP)
 - a. Deposition: 0 (Cumulative total: 16)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 8)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Laser/photodetector-based LIDAR design and operation for self-driving vehicles.
- 40. Active case work: 1Q2017-2Q2017; *The Chamberlain Group Inc., v. Techtronic Industries Co., Ltd, Techtronic Industries North America et al.*, Challenge to U.S Patent No. 7,862,209 (retained by plaintiff – The Chamberlain Group) – Morgan, Lewis & Brockius, LLP.
 - a. Deposition: 0 (Cumulative total: 16)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 8)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 2)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: LED based luminaire design for lighting.
- 41. Active case work: 1Q2017-1Q2018; *Uber Technologies Inc., Ottomotto LLC., Otto Trucking LLC., v. Waymo LLC (Google)*, 17-CV-00939 (N.D. Ca filed: Mar 10th, 2017), (retained by defendant Uber Technologies Inc.) – Morrison and Foerster LLP. Deposition experience (x3) and trial experience (case settled at trial).
 - a. Deposition: 3 (Cumulative total: 19)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 9)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 1 (Cumulative total: 3)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Optical and electrical device, optics, and package designs for LIDAR based self-driving vehicles.
- 42. Active case work: 2Q2017-2Q2017; *Heptagon v. ST Microelectronics* IPR petition; (retained by plaintiff Heptagon) – Proskauer Rose LLP).
 - a. Deposition: 0 (Cumulative total: 19)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 9)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 3)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Optoelectronic based proximity sensors using LEDs and photodetectors.

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43. Active case work: 2Q2017-2Q2018; *AT&T Inc., v. Sycamore Holdings LLC.*, 16-CV-00588 (E. D. Tx filed: Jun 6th 2016); (retained by defendant AT&T Inc.) - Kirkland and Ellis LLP. Deposition experience (x1)
 - a. Deposition: 1 (Cumulative total: 20)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 9)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 3)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Coding designs of optical digital signals for high performance optical networks.
44. Active case work: 2Q2017 – 4Q2017; *Clearfield Inc., v. CommScope, ADC, Tyco, and TE Connectivity*, 17-CV-00307 (D.C. Minn. filed Jan 31st 2017); (retained by defendant Clearfield, Inc.) – Pepper Hamilton LLP
 - a. Deposition: 0 (Cumulative total: 20)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 9)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 3)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Fiber optic connectors, panels, and distribution switches using optoelectronic components.
45. Active case work: 2Q2017 – 4Q2017; *Clearfield Inc., v. CommScope, ADC, Tyco, and TE Connectivity*, IPR2017-02122 (PTAB filed Sep. 15th 2017); (retained by defendant Clearfield, Inc.) – Pepper Hamilton LLP
 - a. Deposition: 0 (Cumulative total: 20)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 9)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 3)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Fiber optic connectors, panels, and distribution switches using optoelectronic components.
46. Active case work: 2Q2017 – 4Q2017; *Clearfield Inc., v. CommScope, ADC, Tyco, and TE Connectivity*, IPR2018-00003 (PTAB filed Oct. 6th 2017); (retained by defendant Clearfield, Inc.) – Pepper Hamilton LLP
 - a. Deposition: 0 (Cumulative total: 20)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 9)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 3)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Fiber optic connectors, panels, and distribution switches using optoelectronic components.
47. Active case work: 2Q2017 – 4Q2017; *Clearfield Inc., v. CommScope, ADC, Tyco, and TE Connectivity*, IPR2018-00154 (PTAB filed Nov. 7th 2017); (retained by defendant Clearfield, Inc.) – Pepper Hamilton LLP
 - a. Deposition: 0 (Cumulative total: 20)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 9)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 3)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Fiber optic connectors, panels, and distribution switches using optoelectronic components.
48. Active case work: 4Q2016-2Q2017; *Antunes Inc.*, Pre-litigation IP patent review; Case No. TBD; (retained by plaintiff – Antunes Inc. and Chapman Spingola LLP).
 - a. Deposition: 0 (Cumulative total: 20)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 9)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 3)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: High power grating surface emitter laser diodes, and associated packaging and device design for laser-based cooking ovens.
49. Active case work: 1Q2017-2Q2017; *Core Optical Technologies LLC. v. Fujitsu Network Communications, Inc.*, 16-CV-00437 (C. D. Ca filed: Mar 7th 2016); (retained by defendant Fujitsu Network Communications) – Morrison & Foerster LLP.
 - a. Deposition: 0 (Cumulative total: 20)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 9)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 3)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Fiber optic based optical communications for coherent technologies
50. Active case work: 3Q2017-4Q2018; *Oyster Optics LLC v. Coriant America, et al*, 16-CV-01302 (E. D. Tx filed: Nov 24th 2016); (retained by plaintiff Oyster Optics LLC) – Russ August & Kabat LLP.

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- a. Deposition: 1 (Cumulative total: 21)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 9)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 3)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Fiber optic based optoelectronic semiconductor component design and operation.
51. Active case work: 3Q2017-4Q2018; *Oyster Optics LLC v. Infinera, Alcatel-Lucent, Fujitsu, Cisco Systems, Huawei*, 16-CV-01295, 16-CV-01297, 16-CV-01299, 16-CV-01301, 16-CV-01303 (E. D. Tx filed: Nov 24th 2016); (retained by plaintiff Oyster Optics LLC) – Russ August & Kabat LLP. Deposition experience (x1).
- a. Deposition: 1 (Cumulative total: 22)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 9)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 3)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Fiber optic based optoelectronic semiconductor component design and operation. Including both direct detect and coherent communications, and encoding techniques such as PSK, QPSK, AM, FM etc.
52. Active case work: 3Q2017-4Q2017; *Olympus*, Pre-litigation IP and Due Diligence; Case No. TBD; (retained by plaintiff – Olympus and Fish & Richardson P.C.)
- a. Deposition: 0 (Cumulative total: 22)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 9)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 3)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: High volume, low cost optical lens and optics technology.
53. Active case work: 3Q2017-1Q2018; *Honeywell International, Inc et al v. Code Corporation et al.*, ITC No 337-TA-1061 (filed Jun 28th 2017), “Certain barcode readers, scan engines, products containing the same, and components thereof,” (retained by respondent – Honeywell and Alston and Bird LLP)
- a. Deposition: 1 (Cumulative total: 23)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 9)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 3)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Bar-code scanners and associated optical/optoelectronic component performance and operation.
54. Active case work: 4Q2017-1Q2019; *Godo Kaisha IP Bridge 1 v. Intel Corp.*, 17-CV-00676 (filed Sep 29th 2017), (retained by plaintiff – Godo Kaisha IP Bridge 1) - Ropes and Gray, LLP.
- a. Deposition: 0 (Cumulative total: 23)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 9)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 3)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Fabrication, design, and reverse engineering of silicon-based FET ICs.
55. Active case work: 4Q2017-3Q2018; *Maxim Integrated Products, Inc. and Volterra Semiconductor LLC., v. Silicon Mitus Inc., and Silicon Mitus Technology Inc.*, 17-CV-03507 (N. D. Ca: filed Jun 16th 2017), (retained by defendant Silicon Mitus) – Pillsbury Winthrop Shaw Pittman, LLP. (Deposition x1 and trial experience x1)
- a. Deposition: 1 (Cumulative total: 24)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 10)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 1 (Cumulative total: 4)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Fabrication, design, characterization, and packaging of silicon-based FET ICs for power applications
56. Active case work: 2Q2018-3Q2018; *Cree, Inc., v. Document Security Systems Inc.*, 17-CV-4263 (C.D. Ca filed: Apr 17th 2017), (retained by defendant Cree Inc.) - Jones Day, LLP
- a. Deposition: 0 (Cumulative total: 24)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 10)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 4)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Design and packaging of high brightness GaN based LEDs for luminaires.
57. Active case work: 2Q2018-2Q2018; *Weisen v., Ram Telecom International (RTI).*, CGC-16-554331 (Sup Ca: filed 3rd May 2017) (retained by plaintiff Weisen, J) - Yetter Coleman, LLP. Deposition experience (x1) and trial experience (x1).

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- a. Deposition: 1 (Cumulative total: 25)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 11)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 1 (Cumulative total: 5)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Submarine and subsea fiber optic cables: technology, markets, economic impact, and history.
58. Active case work: 2Q2018-3Q2018; *Seoul Semiconductor, v. Document Security Systems Inc.*, 17-CV-00981 (C.D. Ca filed: Apr 17th 2017), (retained by defendant Seoul Semiconductor) - Latham and Watkins LLP
- a. Deposition: 1 (Cumulative total: 26)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 11)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 5)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Design and packaging of high brightness GaN based LEDs for luminaires.
59. Active case work: 3Q2018-4Q2018; *NEC Display Solutions Inc., and NEC Display Solutions of America, Inc., v. Ultravision*, ITC Case# 337-TA-1114 (filed 24th May 2018), "Certain Modular LED Display Panels and Components Thereof," (retained by respondent Jones Day, LLP)
- a. Deposition: 0 (Cumulative total: 26)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 11)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 5)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Large LED Panels, LED displays, LED modular panel design, LED thermal engineering and color displays for outdoor environments.
60. Active case work: 3Q2018-3Q2018; IFT (Innovative Foundry Technologies) (pre-lit), retained by plaintiff Mintz Levin, Cohen, Ferris, Glovsky, and Popeo PC.)
- a. Deposition: 0 (Cumulative total: 26)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 11)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 5)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: CMOS device (inc FinFETs) and IC fabrication techniques at 40, 28, 20, 16nm nodes.
61. Active case work: 4Q2018-2Q2019; *Eidolon Optical LLC, v. Haag-Streit AG*, IPR2018-01311, (retained by patent owner Eidolon Optical LLC) - McInnes & McLane LLP
- a. Deposition: 0 (Cumulative total: 26)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 11)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 5)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: High brightness InGaAlP, GaP, AlGaAs, and GaN/InGaN based LEDs for use in medical instruments
62. Active case work: 3Q2018-3Q2018; *Voxtel Inc., v. Joseph Lachapelle & Luminar Technologies Inc.*, 18-CV-27356 (D. Or. filed: Dec 18th 2017), (retained by plaintiff Voxtel Inc.) - Ater Wynne LLP
- a. Deposition: 0 (Cumulative total: 26)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 11)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 5)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: LIDAR optical and electronic component and system technology
63. Active case work: 3Q2018-1Q2019; *Alta Devices, v. LG Electronics Inc.*, 18-CV-00404 (N.D. Ca. filed: May 7th 2018), (retained by defendant LG Electronics Inc.) - Hogan Lovells LLP
- a. Deposition: 0 (Cumulative total: 26)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 11)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 5)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Trade Secrets and misappropriation of trade secrets for: GaAs based solar cell design, fabrication, manufacturing, and device performance
64. Active case work: 3Q2018-3Q18; *Opterna AM Inc., v. Commscope Technologies Inc.*, Pre-litigation preparation, (retained by defendant Opterna AM Inc.) - Sterne Kessler LLP
- a. Deposition: 0 (Cumulative total: 26)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 11)
 - i. ITC trial appearance: 0 (Cumulative total: 2)

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- ii. District Court trial appearance: 0 (Cumulative total: 5)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Fiber optic connectors, panels, and distribution switches using optoelectronic components.
- 65. Active case work: 4Q2018 – 1Q2019; *U.D. Electronic Corp., v. Pulse Electronics, Inc.*, Preparation for IPR filing: IPR2019-00508 (PTAB filed Dec 26th 2018); and support for 18-CV-00373 (S.D. Ca. filed: Feb 16th 2018) (retained by petitioner U. D. Electronic Corp.) – Procopio, Cory, Hargreaves and Savitch LLP
 - a. Deposition: 0 (Cumulative total: 26)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 11)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 5)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Electrical and fiber optic connectors, panels, and distribution switches using both electronic and optoelectronic components.
- 66. Active case work: 4Q2018 – 1Q2019; *U.D. Electronic Corp., v. Pulse Electronics, Inc.*, Preparation for IPR filing: IPR2019-00515 (PTAB filed Dec 31st 2018); and support for 18-CV-00373 (S.D. Ca. filed: Feb 16th 2018) (retained by petitioner U. D. Electronic Corp.) – Procopio, Cory, Hargreaves and Savitch LLP
 - a. Deposition: 0 (Cumulative total: 26)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 11)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 5)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Electrical and fiber optic connectors, panels, and distribution switches using both electronic and optoelectronic components.
- 67. Active case work: 4Q2018 – 1Q2019; *U.D. Electronic Corp., v. Pulse Electronics, Inc.*, Preparation for IPR filing: IPR2019-00262 (PTAB filed Nov 9th 2018); and support for 18-CV-00373 (S.D. Ca. filed: Feb 16th 2018) (retained by petitioner U. D. Electronic Corp.) – Procopio, Cory, Hargreaves and Savitch LLP
 - a. Deposition: 0 (Cumulative total: 26)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 11)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 5)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Electrical and fiber optic connectors, panels, and distribution switches using both electronic and optoelectronic components.
- 68. Active case work: 4Q2018 – 1Q2019; *U.D. Electronic Corp., v. Pulse Electronics, Inc.*, Preparation for IPR filing: IPR2019-00511 (PTAB filed Dec 28th 2018); and support for 18-CV-00373 (S.D. Ca. filed: Feb 16th 2018) (retained by petitioner U. D. Electronic Corp.) – Procopio, Cory, Hargreaves and Savitch LLP
 - a. Deposition: 0 (Cumulative total: 26)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 11)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 5)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Electrical and fiber optic connectors, panels, and distribution switches using both electronic and optoelectronic components.
- 69. Active case work: 4Q2018 – 1Q2019; *Semiconductor Energy Laboratory Co. Ltd., v. Bluehouse Global Ltd.*, Preparation for IPR filing: IPR2018-01405 (PTAB filed Jul 18th 2018); (retained by patent owner SEL Co Ltd.) – Robinson Intellectual Law Office, P.C. (Counsel represented by Fish and Richardson LLP).
 - a. Deposition: 0 (Cumulative total: 26)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 11)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 5)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Semiconductor displays using active matrix LCD and thin film transistor technology. Design, fabrication, and circuit layout.
- 70. Active case work: 4Q2018 – 1Q2019; *Semiconductor Energy Laboratory Co. Ltd., v. Bluehouse Global Ltd.*, Preparation for IPR filing: IPR2018-01393 (PTAB filed Jul 13th 2018); (retained by patent owner SEL Co Ltd.) – Robinson Intellectual Law Office, P.C. (Counsel represented by Fish and Richardson LLP)
 - a. Deposition: 0 (Cumulative total: 26)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 11)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 5)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Semiconductor displays using active matrix LCD and thin film transistor technology. Design and fabrication technology.

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71. Active case work: 4Q2018 - 1Q2019; *The Sloan Company dba SloanLED, v. Principle Lighting Group, LLC.*, 18-CV-06449 (C.D. Ca. filed: Jul 26th 2018), (retained by defendant Sloan LED.) - Ferguson Case Orr Paterson LLP
 - a. Deposition: 0 (Cumulative total: 26)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 12)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 1 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: LED lighting, LED luminaires, LED performance, electrical and mechanical design and construction.
72. Active case work: 1Q2019 - 1Q2019; *HTC Corporation, v. Lemire Illumination Technologies.*, 18-CV-00021 (E.D. Tx. filed: Jan 21st 2018), (retained by defendant HTC Corporation) - Perkins Coie LLP
 - a. Deposition: 0 (Cumulative total: 26)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 12)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: LEDs for mobile phones
73. Active case work: 1Q2019 - 2Q2019; *Frys Electronics, v. Seoul Semiconductor Co. and Seoul Viosys Co.*, 2:18-CV-00386-JRG (E. D. Tx. filed: Nov 20th 2018), (retained by defendant Frys Electronics) - Lamkin IP Defense
 - a. Deposition: 0 (Cumulative total: 26),
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 12)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: LED chips, LED packaging, LED lenses, LED luminaires, backlights, displays, and televisions/monitors
74. Active case work: 2Q2019 – 4Q2019; *Hanwha Q CELLS & Advance Materials Corporation, v. JinkoSolar, LONGi Solar, REC Solar*, ITC 337-TA-1151 (filed: Apr 4th 2019), (“Certain Photovoltaic Cells and Products Containing Same,”), retained by patent owner and plaintiff Hanwha Q CELLS) - Covington and Burling LLP
 - a. Deposition: 2 (Cumulative total: 28)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 12)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
75. Active case work: 2Q2019-3Q2019; *Hanwha Q CELLS & Advance Materials Corporation, v. JinkoSolar and affiliates*, 19-CV-00450 (D. Del. filed: Jan 21st 2018), (retained by patent owner and plaintiff Hanwha Q CELLS) - Covington and Burling LLP
 - a. Deposition: 0 (Cumulative total: 28)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 12)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Silicon solar cells and materials analysis of passivation layers
76. Active case work: 2Q2019-2Q2019; *Oyster Optics LLC v. Infinera Inc.*, 2:18-CV-00206 (E. D. Tx filed: May 15th 2018); (retained by plaintiff Oyster Optics LLC) – Russ August & Kabat LLP.
 - a. Deposition: 0 (Cumulative total: 28)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 12)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Fiber optic based optoelectronic semiconductor component and transceiver design/operation.
77. Active case work: 2Q2019 – 2Q2019; *Nichia Corporation & Osram Opto Semiconductors Inc., v. Lighting Science Group Corp.*, IPR filing: IPR2019-01259 (PTAB filed Jun 28th 2019); (retained by petitioner Nichia and Osram Opto.) – Shearman and Sterling, LLP
 - a. Deposition: 0 (Cumulative total: 28)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 12)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: LED chips, LED packaging and ceramic thermal heat sinking technology.
78. Active case work: 2Q2019 – 3Q2019; *Nichia Corporation v. Lighting Science Group Corp.*, 2:17-CV-08849 (C. D. Ca filed Jul 12th 2017); (retained by defendant Nichia) – Shearman and Sterling, LLP

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- a. Deposition: 0 (Cumulative total: 28)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 12)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: LED chips, LED packaging and ceramic thermal heat sinking technology
79. Active case work: 3Q2019-3Q2019; *Applied Optoelectronics Inc v. Class Action Lawsuit*, 4:17-CV-02399 (S. D. Tx filed: Mar 6th 2018); (retained by plaintiff Class Action Lawsuit) – Levi and Korsinsky, LLP
- a. Deposition: 0 (Cumulative total: 28)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 12)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Fiber optic based optoelectronic semiconductor components, transceivers, and sub-systems.
80. Active case work: 3Q2019-3Q2019; *DNA Motor v. Kuen Hwa Traffic Industrial Co.*, 18-CV-05664 (C. D. Ca filed: Jan 15th 2019); (defendant DNA Motor) – Elizabeth Yang, Law and Mediation Office
- a. Deposition: 0 (Cumulative total: 28)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 12)
 - i. ITC trial appearance: 0 (Cumulative total: 2)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: LED design patent, and the design of an aftermarket LED based headlight assembly for an automobile.
81. Active case work: 3Q2019 – 1Q2020; *Nichia Corporation, Osram Opto Semiconductors Inc., Philips Lumileds, GE Consumer Lighting, Cree, and Signify v. Lighting Science Group Corp.*, ITC 337-TA-1168 (filed: Apr 30th 2019), (“Certain Light-Emitting-Diode products, systems, and components thereof (III)”) (retained by respondents Nichia, Osram Optoelectronics, Philips Lumileds, GE Consumer Lighting, Cree Hong Kong., Signify Corp.) – Shearman and Sterling, LLP
- a. Deposition: 1 (Cumulative total: 29)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 13)
 - i. ITC trial appearance: 1 (Cumulative total: 3)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: LED chips, LED packaging and ceramic thermal heat sinking technology (LTCC).
82. Active case work: 4Q2019 – 1Q2020; *Amazon.com Inc, Bed, Bath and Beyond, IKEA, Target, and Walmart Inc., v. Regents of the University of California*, ITC 337-TA-1172 (filed: July 30th 2019), (“Certain Filament Light-Emitting-Diodes and products containing same”) (retained by respondents Amazon.com Inc, Bed, Bath and Beyond, IKEA, Target, and Walmart Inc.) – Morrison and Foerster, LLP
- a. Deposition: 2 (Cumulative total: 31)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 13)
 - i. ITC trial appearance: 0 (Cumulative total: 3)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: LED chips, LED packaging and light bulb filaments with transparent sub-mounts.
83. Active case work: 4Q2019 – 4Q2019; *U.D. Electronic Corp., v. Pulse Electronics, Inc.*, IPR2019-00511 (PTAB filed Dec 28th 2018), (retained by petitioner U. D. Electronic Corp.) – Procopio, Cory, Hargreaves and Savitch LLP
- a. Deposition: 0 (Cumulative total: 31)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 13)
 - i. ITC trial appearance: 0 (Cumulative total: 3)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Electrical and fiber optic connectors, panels, and distribution switches using both electronic and optoelectronic components.
84. Active case work: 1Q2020 – 2Q2020; *IKEA, v. Regents of the University of California*, ITC 337-TA-1172 (filed: July 30th 2019), (“Certain Filament Light-Emitting-Diodes and products containing same”) (retained by respondents IKEA) – Flaster and Greenberg, LLP
- a. Deposition: 2 (Cumulative total: 31)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 13)
 - i. ITC trial appearance: 0 (Cumulative total: 3)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: LED chips, LED packaging and light bulb filaments with transparent sub-mounts.

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85. Active case work: 1Q2020-1Q2020; *Hanwha Solutions Corporation, v. Longi Green Energy, Longi Solar Technology, Longi Trading et al.*, IPR2019-01072 (PTAB filed 13th May 2019), (retained by patent owner Hanwha Solutions Corporation) - Covington and Burling LLP
 - a. Deposition: 0 (Cumulative total: 31)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 13)
 - i. ITC trial appearance: 0 (Cumulative total: 3)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Silicon solar cells and materials analysis of passivation layers
86. Active case work: 1Q2020-1Q2020; *Hanwha Solutions Corporation, v. REC Solar Pte. Ltd. and JinkoSolar (U.S.) Inc.* IPR2019-01145 (PTAB filed 6th March 2019), (retained by patent owner Hanwha Solutions Corporation) - Covington and Burling LLP
 - a. Deposition: 0 (Cumulative total: 31)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 13)
 - i. ITC trial appearance: 0 (Cumulative total: 3)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Silicon solar cells and materials analysis of passivation layers
87. Active case work: 4Q2019 – 2Q2020; *Viavi Solutions Inc., v. Optrontec Inc.*, ITC 337-TA-1187 (filed: 18th November 2019), (“Certain Electronic devices with Optical Filters and Optical Sensor Systems and Components Thereof”) (retained by complainant Viavi Solutions Inc.) – Venable, LLP
 - a. Deposition: 0 (Cumulative total: 31)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 13)
 - i. ITC trial appearance: 0 (Cumulative total: 3)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Optical filters and optical sensor systems, design and fabrication of dielectric materials for passband filters in applications such as optical communications, imaging, sensing, medical, automotive.
88. Active case work: 2Q2020 – 4Q2020; *Leviton Manufacturing Co., v. Corning Optical Communications LLC.*, ITC 337-TA-1194 (filed: 19th March 2020), (“Certain High-Density Fiber Optic Equipment and Components Thereof”) (retained by respondent Leviton Manufacturing Co.) – Morrison & Foerster, LLP
 - a. Deposition: 1 (Cumulative total: 32)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 14)
 - i. ITC trial appearance: 1 (Cumulative total: 4)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Fiber optic adapters, fiber optic connectors (simplex, duplex, quad, multi-fiber), fiber trays, racks, and fiber cabinet equipment.
 - d. Technology: LED chips, LED packaging and light bulb filaments with transparent sub-mounts.
89. Active case work: 2Q2020 – 2Q2020; subject to PO/NDA and engagement letter xxx v. yyy, Post Grant Review petition for proceedings (US Patent # zzz), retained by Morrison and Foerster, LLP
 - a. Deposition: 0 (Cumulative total: 31)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 14)
 - i. ITC trial appearance: 0 (Cumulative total: 4)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Optoelectronics, LEDs, lead frame packaging, optics, optical lenses, GaN (Gallium Nitride), optical transparency
90. Active case work: 1Q2020-3Q2020; *Cellect LLC, v. Samsung Electronics Co., LTD and Samsung Electronics America, Inc.*, IPR2020-00560 (PTAB filed 16th Feb 2020), (retained by patent owner Cellect LLC) – retained by Kramer Levin Naftalis & Frankel LLP
 - a. Deposition: 0 (Cumulative total: 32)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 14)
 - i. ITC trial appearance: 0 (Cumulative total: 4)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
 - c. Technology: Silicon CMOS image sensors, drive electronics, smart pixels and CCD technology
91. Active case work: 2Q2020-2Q2020; *Panasonic, v. 3M Innovative Properties Company.*, Preparation for IPR filing, (retained by defendant Panasonic) – retained by Westerman Hattori Daniels & Adrian LLP
 - a. Deposition: 0 (Cumulative total: 32)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 14)
 - i. ITC trial appearance: 0 (Cumulative total: 4)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)

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- iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 3)
- c. Technology: Touch sensor (resistive, optical, and capacitive) technology for mobile displays. Analysis of display, electronic, and optical technologies.
- 92. Active case work: 2Q2020-3Q2020; *Longi Green Energy Technology Co, Longi Solar Technology Co, Long Solar Technology (H.K., Kuching, Taizhou, Zhejiang, Hefei, US) v. Hanwha Solutions Corporation.*, IPR 2019-01072, (retained by patent owner Hanwha Solutions Corporation) – Quinn Emanuel Urquhart & Sullivan, LLP
 - a. Deposition: 1 (Cumulative total: 33)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 16)
 - i. ITC trial appearance: 0 (Cumulative total: 4)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 1 (Cumulative total: 5)
 - c. Optoelectronics; solar cell design, fabrication, device performance, packaging, and interface issues relating to passivation (both chemical and electric field enhanced).
- 93. Active case work: 3Q2020-3Q2020; *Oyster Optics LLC v. Ciena Corp.*, 4:17-CV-05920 (N. D. CA filed: April 22nd 2020); (retained by plaintiff Oyster Optics LLC) – Russ August & Kabat LLP.
 - a. Deposition: 0 (Cumulative total: 33)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 16)
 - i. ITC trial appearance: 0 (Cumulative total: 4)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 5)
 - c. Technology: Fiber optic based optoelectronic semiconductor component design and operation, especially phase shift keying (PSK, QPSK) and phase based coherent communications.
- 94. Active case work: 3Q2020-2Q2021; *Capella Photonics Inc., v. Infinera Corporation, Tellabs, Tellabs Operations Inc., Coriant American Inc., and Coriant USA Inc.*, 2:20-CV-00077 (E. D. TX filed: March 16th 2020); (retained by defendant Infinera Inc.) – Baker Botts LLP.
 - a. Deposition: 1 (Cumulative total: 34)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 16)
 - i. ITC trial appearance: 0 (Cumulative total: 4)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 5)
 - c. Technology: Fiber optic wavelength selective switches (WSS), reconfigurable add-drop multiplexors (ROADMs), and their design. Technical issues include polarization, wavelength selection, coupling, mux/demux and operation in optical networks.
- 95. Active case work: 3Q2020-3Q2020; *Longi Green Energy Technology Co, Longi Solar Technology Co, Long Solar Technology (H.K., Kuching, Taizhou, Zhejiang, Hefei, US) v. Hanwha Solutions Corporation.*, IPR 2020-00353, (retained by patent owner Hanwha Solutions Corporation) – Quinn Emanuel Urquhart & Sullivan, LLP
 - a. Deposition: 0 (Cumulative total: 34)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 16)
 - i. ITC trial appearance: 0 (Cumulative total: 4)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 5)
 - c. Optoelectronics; solar cell design, fabrication, device performance, packaging, and interface issues relating to passivation (both chemical and electric field enhanced).
- 96. Active case work: 3Q2020-2Q2021; *Appotronics Corporation Ltd. v. Delta Electronics Inc.*, 2:19-CV-00466 (E. D. Va filed: July 22nd 2020); (retained by defendant Delta Corporation Inc) – Pillsbury Winthrop Shaw Pitman LLP.
 - a. Deposition: 1 (Cumulative total: 35)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 16)
 - i. ITC trial appearance: 0 (Cumulative total: 4)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 5)
 - c. Technology: Light projectors for display and the color wheel, phosphor technology, high power visible lasers for projection, and the associated packaging of the modules/projectors for efficient cost design..
- 97. Active case work: 3Q2020 – 2Q2021; *Ideal Industries Lighting LLC (dba Cree Lighting) v. RAB Lighting Inc.*, ITC 337-TA-1213 (filed: 15th July 2020), (“Certain Light-emitting Diode Products, Fixtures, and Components thereof”), (retained by plaintiff Ideal Industries Lighting LLC (dba Cree Lighting) – Quinn Emanuel Urquhart an Sullivan, LLP
 - a. Deposition: 1 (Cumulative total: 36)
 - b. Trial/Hearing/court/PTAB appearance: 2(x2 oral testimony); (Cumulative total: 18)
 - i. ITC trial appearance: 2 (Cumulative total: 6)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 5)
 - c. Technology: Visible GaN based LEDs and various packaging optical lens designs for directing and re-directing LED light output with applications in street lighting.

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98. Active case work: 3Q2020-3Q2020; *Collect LLC, v. Samsung Electronics Co., LTD and Samsung Electronics America, Inc., ex parte* declaration entitled, 'Hand-held computers incorporating reduced area imaging devices', for U.S. Patent 6,982,742 (control number 90/014,453), (retained by patent owner Collect LLC) – retained by Kramer Levin Naftalis & Frankel LLP
 - a. Deposition: 0 (Cumulative total: 36)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 18)
 - i. ITC trial appearance: 0 (Cumulative total: 6)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 5)
 - c. Technology: Hand-held silicon CMOS image sensors, drive electronics, smart pixels and CCD technology. Technical history of CCD v. CMOS image sensors in the 1990s and associated performance criteria.
99. Active case work: 3Q2020-3Q2020; *Collect LLC, v. Samsung Electronics Co., LTD and Samsung Electronics America, Inc., ex parte* declaration entitled, 'Communication devices incorporating reduced area imaging devices', for U.S. Patent 6,452,626 (control number 90/014,455), (retained by patent owner Collect LLC) – retained by Kramer Levin Naftalis & Frankel LLP
 - a. Deposition: 0 (Cumulative total: 36)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 18)
 - i. ITC trial appearance: 0 (Cumulative total: 6)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 5)
 - c. Technology: Hand-held silicon CMOS image sensors, drive electronics, smart pixels and CCD technology. Technical history of CCD v. CMOS image sensors in the 1990s and associated performance criteria.
100. Active case work: 4Q2020-4Q2020; *Collect LLC, v. Samsung Electronics Co., LTD and Samsung Electronics America, Inc., IPR* declaration for U.S. Patent 9,198,565 (IPR2020-00476), (retained by patent owner Collect LLC) – retained by Kramer Levin Naftalis & Frankel LLP
 - a. Deposition: 0 (Cumulative total: 36)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 18)
 - i. ITC trial appearance: 0 (Cumulative total: 6)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 5)
 - c. Technology: Hand-held silicon CMOS image sensors, drive electronics, smart pixels and CCD technology. Technical history of CCD v. CMOS image sensors in the 1990s and associated performance criteria.
101. Active case work: 4Q2020-4Q2020; *Collect LLC, v. Samsung Electronics Co., LTD and Samsung Electronics America, Inc., IPR* declaration for U.S. Patent 9,667,896 (IPR2020-00477), (retained by patent owner Collect LLC) – retained by Kramer Levin Naftalis & Frankel LLP
 - a. Deposition: 0 (Cumulative total: 36)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 18)
 - i. ITC trial appearance: 0 (Cumulative total: 6)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 5)
 - c. Technology: Hand-held silicon CMOS image sensors, drive electronics, smart pixels and CCD technology. Technical history of CCD v. CMOS image sensors in the 1990s and associated performance criteria.
102. Active case work: 4Q2020 – 1Q2021; *U.D. Electronic Corp., v. Pulse Electronics, Inc., 3:18-CV-00373* (Filed Fed 16th 2018), (retained by petitioner U. D. Electronic Corp.) – retained by defendant Perkins Coie LLP.
 - a. Deposition: 1 (Cumulative total: 37)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 18)
 - i. ITC trial appearance: 0 (Cumulative total: 6)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 5)
 - c. Technology: Electrical and fiber optic connectors, panels, and distribution switches using both electronic and optoelectronic components. Noise suppression using EMI between electrical components and connectors.
103. Active case work: 4Q2020-4Q2020; *Collect LLC, v. Samsung Electronics Co., LTD and Samsung Electronics America, Inc., IPR* declaration for U.S. Patent 9,186,052 (IPR2020-00512), (retained by patent owner Collect LLC) – retained by Kramer Levin Naftalis & Frankel LLP
 - a. Deposition: 1 (Cumulative total: 38)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 19)
 - i. ITC trial appearance: 0 (Cumulative total: 6)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 1 (Cumulative total: 6)

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- c. Technology: Hand-held silicon CMOS image sensors, drive electronics, smart pixels and CCD technology. Technical history of CCD v. CMOS image sensors in the 1990s and associated performance criteria.
- 104. Active case work: 4Q2020–4Q2020; *Collect LLC, v. Samsung Electronics Co., LTD and Samsung Electronics America, Inc.*, IPR declaration for U.S. Patent 9,186,052 (IPR2020-00475), (retained by patent owner Collect LLC) – retained by Kramer Levin Naftalis & Frankel LLP
 - a. Deposition: 1 (Cumulative total: 39)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 20)
 - i. ITC trial appearance: 0 (Cumulative total: 6)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 1 (Cumulative total: 7)
 - c. Technology: Hand-held silicon CMOS image sensors, drive electronics, smart pixels and CCD technology. Technical history of CCD v. CMOS image sensors in the 1990s and associated performance criteria.
- 105. Active case work: 3Q2020 – 1Q2021; *Huawei Technologies Co. Ltd. v. Verizon Communications, Inc., et al.*, 20-CV-030-JRG (TX E. D. Filed 2nd April 2020), (retained by plaintiff Huawei Technologies Co. Ltd.) – retained by plaintiff Caldwell Cassady Curry P.C.
 - a. Deposition: 0 (Cumulative total: 39)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 20)
 - i. ITC trial appearance: 0 (Cumulative total: 6)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 7)
 - c. Technology: Analysis of coding for fiber optic communications, specifically in relation to the standardization process for the Telecommunication Standardization Sector of the International Telecommunications Union (“ITU-T”), including the ITU-T’s G.709: Interfaces for the optical transport network standard (“G.709” or “the G.709 Standard”). In particular, the technical issues that relate to OTN hierarchy; functionality of the overhead in support of multi-wavelength optical networks; frame structures, bit rates, and formats for mapping client signals.
- 106. Active case work: 1Q2021 – 3Q2021; *IKEA et al., v. Regents of the University of California*, ITC 337-TA-1220 (filed: 29th September 2020), (“Certain filament light-emitting diodes and products containing same (II)”), (retained by respondent JDG: IKEA, Global Value Lighting, Signify, Home Depot, GE, Satco) – retained by Flaster Greenberg PC, Kirkland and Ellis, GT Law (Greenberg Traurig), Alston and Bird, Jones Day and Goodwin Law as JDG counsel.
 - a. Deposition: 2 (Cumulative total: 41)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 21)
 - i. ITC trial appearance: 1 (Cumulative total: 7)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 7)
 - c. Technology: LED chips, LED packaging and light bulb filaments with transparent sub-mounts.
- 107. Active case work 4Q2020 – 1Q2021; *Uber Technologies Inc., v. Anthony Scott Levandowski*; Case No. 20-30242 (HLB) and 20-03050 (filed 16th September 2020), retained by defendant Uber Technologies Inc., retained by Jenner and Block LLP.
 - a. Deposition: 0 (Cumulative total: 41)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 21)
 - i. ITC trial appearance: 0 (Cumulative total: 7)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 7)
 - c. Technology: LIDAR technology for motor vehicles that includes fiber amplifiers, LIDAR hardware, laser diodes, photodetectors, fiber links, and free space communications.
- 108. Active case work: 1Q2021 – 3Q2021; *CoSemi Technologies, v. Everpro Technologies, Fibbr Technologies, Logitech, and Facebook Technologies*, ITC 337-TA-1233 (filed: 29th October 2020), “Certain active optical cables and products containing same”, (retained by claimant CoSemi Technologies) – retained by Rutan & Tucker LLP.
 - a. Deposition: 1 (Cumulative total: 42)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 21)
 - i. ITC trial appearance: 0 (Cumulative total: 7)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 7)
 - c. Technology: Active optical cables with embedded silicon modulator ICs, copper cable, fiber optic cable, VCSEL laser diodes, photodetectors and cable sheathing for consumer applications such as gaming, HDMI, USB, etc.
- 109. Active case work: 2Q2021 – 3Q2021; *Acuity Brands Lighting, Inc. v. Heavy Duty Lighting (HDL), LLC.*, 20-CV-03648-SCJ (GA N. D. Filed 2nd September 2020), (retained by defendant Acuity Brands Lighting) – retained by defendant Duane Morris LLP.

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- a. Deposition: 1 (Cumulative total: 43)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 21)
 - i. ITC trial appearance: 0 (Cumulative total: 7)
 - ii. District Court trial appearance: 0 (Cumulative total: 6)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 7)
 - c. Technology: LED lighting, LED chips, LED packages and LED packaging technologies such as molding, glob-top, substrates, die mounting, optical reflectors, and electrical interconnect layouts.
110. Active case work: 2Q2021 – 4Q2021; *Jiaxing Super Lighting Electric Appliance Co., LTD and Obert Inc. v. CH Lighting Technology co., LTD., Elliott Electric Supply Inc., and Shaoxing Ruising Lighting co., Ltd.*, 20-CV-00018-ADA (TX W D. Filed 16th March 2020), (retained by defendant CH Lighting et al) – retained by defendant Holland and Knight LLP.
- a. Deposition: 1 (Cumulative total: 44)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 22)
 - i. ITC trial appearance: 0 (Cumulative total: 7)
 - ii. District Court trial appearance: 1 (Cumulative total: 7)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 7)
 - c. Technology: LED lighting and LED packaging technologies for T8 and T12 form factor tube lighting. Technologies such as LED luminaire/tube packaging, mechanical structure, thermal heat dissipation, electronic circuitry, printed circuit boards, and LED chips.
111. Active case work: 3Q2021 – 1Q2022; *ASUSTEK Computer Inc. v. KT Imaging USA LLC*, 20-CV-00300-ADA (TX W D. Filed 20th April 2020, (retained by defendant ASUSTEK Computer Inc) – retained by defendant Turner Boyd LLP.
- a. Deposition: 0 (Cumulative total: 44)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 22)
 - i. ITC trial appearance: 0 (Cumulative total: 7)
 - ii. District Court trial appearance: 0 (Cumulative total: 7)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 7)
 - c. Technology: Image sensor modules, cameras in PCs/laptops, consumer products, tear downs, optical lenses, optical packaging, optical alignment.
112. Active case work: 3Q2021 – 3Q2021; *Jiaxing Super Lighting Electric Appliance Co., LTD and Obert Inc. v. Maxlite Inc.*, 19-CV-04047 (CA C.D. Filed 8th May 2019), (retained by defendant Maxlite Inc) – retained by defendant Holland and Knight LLP.
- a. Deposition: 0 (Cumulative total: 44)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 22)
 - i. ITC trial appearance: 0 (Cumulative total: 7)
 - ii. District Court trial appearance: 0 (Cumulative total: 7)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 7)
 - c. Technology: LED lighting and LED packaging technologies for T8 and T12 form factor tube lighting. Technologies such as LED luminaire/tube packaging, mechanical structure, thermal heat dissipation, electronic circuitry, printed circuit boards, and LED chips.
113. Active case work: 3Q2021 – 1Q2023; *Feit Electric Company Inc., v. Nichia Corporation*, 20-CV-00359-GW, (CA C. D. Filed 13th January 2020), (retained by defendant Feit Electric Company) – retained by Benesch Friedlander Coplan & Aronoff LLP
- a. Deposition: 2 (Cumulative total: 46)
 - b. Trial/Hearing/court/PTAB appearance: 2 (Cumulative total: 24)
 - i. ITC trial appearance: 0 (Cumulative total: 7)
 - ii. District Court trial appearance: 2 (Cumulative total: 9)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 7)
 - c. Technology: LED lighting, LED chips, LED packages and LED packaging technologies such as lead-frames, molding, glob-top, substrates, die mounting, optical reflectors, and electrical interconnect layouts.
114. Active case work: 2Q2021 – 2Q2022; *Samsung Corporation vs TBD*, Pre-patent litigation, (retained by plaintiff Samsung Corporation), - retained by Quinn Emanuel Urquhart & Sullivan, LLP).
- a. Deposition: 0 (Cumulative total: 46)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 24)
 - i. ITC trial appearance: 0 (Cumulative total: 7)
 - ii. District Court trial appearance: 0 (Cumulative total: 9)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 7)
 - c. Technology: TV displays, OLEDs, LCDs, color gamut, and quality of RGB/white color as per CIE charts and colorimetry (NTSC, sRGB, AdobeRGB etc.,). Analysis of CHL (constant hue locus), quantum dots, nano-crystals, nano-devices, nano-structures to improve light quality output.
115. Active case work 2Q2021 – 2Q2021, *Holochip Corporation v. Edmund Optics, Optotune AG and others TBD*, Pre-patent litigation for ITC, (retained by plaintiff Holochip Corporation), - retained by King and Spalding LLP).
- a. Deposition: 0 (Cumulative total: 46)

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- b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 24)
 - i. ITC trial appearance: 0 (Cumulative total: 7)
 - ii. District Court trial appearance: 0 (Cumulative total: 9)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 7)
 - c. Technology: Fluid lenses, and optical lenses with controlled focus facilities. Packaging of fluid lenses using piezoelectric actuators, and hermetic chambers. Deformable surfaces using micro-fluidics.
116. Active case work: 2Q2021-3Q2021; *Home Depot USA Inc., v. Lynk Labs, Inc.*, IPR declaration for U.S. Patent 10,757,783 (IPR2021-01368), (retained by petitioner Home Depot USA, Inc) – retained by DLA Piper LLP
- a. Deposition: 1 (Cumulative total: 47)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 25)
 - i. ITC trial appearance: 0 (Cumulative total: 7)
 - ii. District Court trial appearance: 0 (Cumulative total: 9)
 - iii. PTAB Court trial/deposition appearance: 1 (Cumulative total: 8)
 - c. Technology: LED products, LED circuits, including both DC and AC circuit design. LED color emission, white light, color mixing, CIE charts, and black body radiators for color temperature.
117. Active case work: 2Q2021-3Q2021; *Home Depot USA Inc., v. Lynk Labs, Inc.*, IPR declaration for U.S. Patent 10,492,251 (IPR2021-01369), (retained by petitioner Home Depot USA, Inc) – retained by DLA Piper LLP
- a. Deposition: 1 (Cumulative total: 48)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 26)
 - i. ITC trial appearance: 0 (Cumulative total: 7)
 - ii. District Court trial appearance: 0 (Cumulative total: 9)
 - iii. PTAB Court trial/deposition appearance: 1 (Cumulative total: 9)
 - c. Technology: LED products, LED circuits, including both DC and AC circuit design. LED color emission, white light, color mixing, CIE charts, and black body radiators for color temperature.
118. Active case work: 3Q2021-3Q2021; *Home Depot USA Inc., v. Lynk Labs, Inc.*, IPR declaration for U.S. Patent 10,091,842 (IPR2021-01540), (retained by petitioner Home Depot USA, Inc) – retained by DLA Piper LLP
- a. Deposition: 1 (Cumulative total: 49)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 27)
 - i. ITC trial appearance: 0 (Cumulative total: 7)
 - ii. District Court trial appearance: 0 (Cumulative total: 9)
 - iii. PTAB Court trial/deposition appearance: 1 (Cumulative total: 10)
 - c. Technology: LED products, LED circuits, including both DC and AC circuit design. LED color emission, white light, color mixing, CIE charts, and black body radiators for color temperature.
119. Active case work: 4Q2021-4Q2021; *Home Depot USA Inc., v. Lynk Labs, Inc.*, IPR declaration for U.S. Patent 10,517,149 (IPR2022-000023), (retained by petitioner Home Depot USA, Inc) – retained by DLA Piper LLP
- a. Deposition: 1 (Cumulative total: 50)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 28)
 - i. ITC trial appearance: 0 (Cumulative total: 7)
 - ii. District Court trial appearance: 0 (Cumulative total: 9)
 - iii. PTAB Court trial/deposition appearance: 1 (Cumulative total: 10)
 - c. Technology: LED products, LED circuits, including both DC and AC circuit design. LED color emission, white light, color mixing, CIE charts, and black body radiators for color temperature.
120. Active case work: 4Q2021-4Q2022; *Everlight Elecs. Co. Ltd. v. Amazon.com, Inc. et al.*, 6:21-CV-00906 (W. D. TX filed: August 31st 2021); (retained by defendant Amazon.com) – Morrison and Foerster LLP.
- a. Deposition: 0 (Cumulative total: 50)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 28)
 - i. ITC trial appearance: 0 (Cumulative total: 7)
 - ii. District Court trial appearance: 0 (Cumulative total: 9)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 10)
 - c. Technology: LED chips, LED packaging with metallic electrodes, flip-chip solder bumping, and doping of semiconductors for electrical conduction.
121. Active case work: 4Q2021-2Q2021; *Hanwha Solutions Corporation and affiliated companies including Q-Cells, Boviet Renewable Power, Boviet Solar, Canadian Solar International v. Advanced Silicon Group Technologies*, ITC 337-TA-1271 (filed: 14th October 2020) “Certain silicon photovoltaic cells and modules with nanostructures, and products containing the same.” (retained by joint defense group consisting of Quinn Emanuel Urquhart & Sullivan, LLP., Morgan Lewis and Bockius, LLP., and Sidley Austin LLP.).
- a. Deposition: 2 (Cumulative total: 52)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 29)
 - i. ITC trial appearance: 1 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 10)
 - c. Technology: Silicon based solar/photovoltaic cells and modules that include fabrication techniques such as deposition, diffusion, wet/dry etching of nanostructures, nanowires, and nano-structures, nano-features, black silicon, monocrystalline wafers, and polysilicon fabrication.

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122. Active case work: 4Q2021-2Q2022; *Dell Computer Inc. v. KT Imaging USA LLC*, Declaration for IPR with patent number 6,876,544 as petitioner, (to be filed), (retained by defendant Dell Computer Inc) – retained by petitioner Farella, Braun, and Martel.
- a. Deposition: 0 (Cumulative total: 52)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 29)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 10)
 - c. Technology: Image sensor modules, cameras in PCs/laptops, consumer products, tear downs, optical lenses, optical packaging, optical alignment.
123. Active case work: 1Q2022-2Q2022; *Cree Lighting, Wolfspeed, Ideal Industries Lighting, v. CAO Lighting*, Declaration for IPR with patent number 6,465,961 as petitioner, (filed 8th April 2022), (retained by defendant Cree Lighting) – retained by Kilpatrick Townsend & Stockton LLP.
- a. Deposition: 2 (Cumulative total: 54)
 - b. Trial/Hearing/court/PTAB appearance: 2 (Cumulative total: 31)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 2 (Cumulative total: 12)
 - c. Technology: LED based light bulbs, LED chips, LED arrays, LED packaging, chip-on-board, heat sinks, GaN, InGa_N, AlGa_N (Gallium Nitride, Indium Gallium Nitride, Aluminum Gallium Nitride) epitaxial layers, active regions, cladding layers, optical mirrors, DBRs
124. Active case work: 1Q2022-2Q2022; *Cree Lighting, Wolfspeed, Ideal Industries Lighting, v. CAO Lighting*, Declaration for IPR with patent numbers 6,634,770 as petitioner, (filed 8th April 2022), (retained by defendant Cree Lighting) – retained by Kilpatrick Townsend & Stockton LLP.
- a. Deposition: 1 (Cumulative total: 55)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 32)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 1 (Cumulative total: 13)
 - c. Technology: LED based light bulbs, LED chips, LED arrays, LED packaging, chip-on-board, heat sinks, GaN, InGa_N, AlGa_N (Gallium Nitride, Indium Gallium Nitride, Aluminum Gallium Nitride) epitaxial layers, active regions, cladding layers, optical mirrors, DBRs
125. Active case work: 1Q2022-2Q2022; *Cree Lighting dba Ideal Industries Lighting, v. CAO Lighting*, 1:21-cv-00634 (MD NC filed 12th Aug 2021.), (retained by defendant Cree Lighting) – retained by Kilpatrick Townsend & Stockton LLP.
- a. Deposition: 0 (Cumulative total: 55)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 32)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 13)
 - c. Technology: LED based light bulbs, LED chips, LED arrays, LED packaging, chip-on-board, heat sinks, GaN, InGa_N, AlGa_N (Gallium Nitride, Indium Gallium Nitride, Aluminum Gallium Nitride) epitaxial layers, active regions, cladding layers, optical mirrors, DBRs
126. Active case work: 1Q2022-2Q2022; *Lite-On Technology Corporation and Genesis Photonics Inc., v. Sensor Electronic Technology Inc., (SETi)*, 6:21-cv-00322 (WD Tex filed 12th Aug 2021.), (retained by plaintiff LiteOn and Genesis) – retained by Pillsbury Winthrop Shaw Pittman LLP.
- a. Deposition: 0 (Cumulative total: 55)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 32)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 13)
 - c. Technology: LED based light bulbs, LED chips, LED arrays, LED packaging, flip-chip packaging, chip-on-board, heat sinks, GaN, InGa_N, AlGa_N (Gallium Nitride, Indium Gallium Nitride, Aluminum Gallium Nitride) epitaxial layers, GaN fabrication, LED quantum well active regions, LEDcladding layers, optical mirrors, DBRs
127. Active case work: 1Q2022-2Q2022; *Lite-On Technology Corporation and Genesis Photonics Inc., v. Sensor Electronic Technology Inc., (SETi)*, Declaration for IPR (IPR2022-00395) as patent owner, (retained by plaintiff LiteOn and Genesis) – retained by Pillsbury Winthrop Shaw Pittman LLP.
- a. Deposition: 2 (Cumulative total: 57)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 34)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 2 (Cumulative total: 15)

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- c. Technology: LED based light bulbs, LED chips, LED arrays, LED packaging, flip-chip packaging, chip-on-board, heat sinks, GaN, InGaN, AlGaN (Gallium Nitride, Indium Gallium Nitride, Aluminum Gallium Nitride) epitaxial layers, GaN fabrication, LED quantum well active regions, LED cladding layers, optical mirrors, DBRs
128. Active case work: 1Q2022-2Q2022; *Lite-On Technology Corporation and Genesis Photonics Inc., v. Sensor Electronic Technology Inc., (SETi)*, Declaration for IPR (IPR2022-00396) as patent owner, (retained by plaintiff LiteOn and Genesis) – retained by Pillsbury Winthrop Shaw Pittman LLP.
- a. Deposition: 0 (Cumulative total: 57)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 34)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 15)
 - c. Technology: LED based light bulbs, LED chips, LED arrays, LED packaging, flip-chip packaging, chip-on-board, heat sinks, GaN, InGaN, AlGaN (Gallium Nitride, Indium Gallium Nitride, Aluminum Gallium Nitride) epitaxial layers, GaN fabrication, LED quantum well active regions, LED cladding layers, optical mirrors, DBRs
129. Active case work: 1Q2022-2Q2022; *Lite-On Technology Corporation and Genesis Photonics Inc., v. Sensor Electronic Technology Inc., (SETi)*, Declaration for IPR (IPR2022-00397) as patent owner, (retained by plaintiff LiteOn and Genesis) – retained by Pillsbury Winthrop Shaw Pittman LLP.
- a. Deposition: 0 (Cumulative total: 57)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 34)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 15)
 - c. Technology: LED based light bulbs, LED chips, LED arrays, LED packaging, flip-chip packaging, chip-on-board, heat sinks, GaN, InGaN, AlGaN (Gallium Nitride, Indium Gallium Nitride, Aluminum Gallium Nitride) epitaxial layers, GaN fabrication, LED quantum well active regions, LED cladding layers, optical mirrors, DBRs
130. Active case work: 1Q2022-2Q2022; *Lite-On Technology Corporation and Genesis Photonics Inc., v. Sensor Electronic Technology Inc., (SETi)*, Declaration for IPR (IPR2022-00406) as patent owner, (retained by plaintiff LiteOn and Genesis) – retained by Pillsbury Winthrop Shaw Pittman LLP.
- a. Deposition: 0 (Cumulative total: 57)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 34)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 15)
 - c. Technology: LED based light bulbs, LED chips, LED arrays, LED packaging, flip-chip packaging, chip-on-board, heat sinks, GaN, InGaN, AlGaN (Gallium Nitride, Indium Gallium Nitride, Aluminum Gallium Nitride) epitaxial layers, GaN fabrication, LED quantum well active regions, LED cladding layers, optical mirrors, DBRs
131. Active case work: 1Q2022-2Q2022; *Lite-On Technology Corporation and Genesis Photonics Inc., v. Sensor Electronic Technology Inc., (SETi)*, Declaration for IPR (IPR2022-00419) as patent owner, (retained by plaintiff LiteOn and Genesis) – retained by Pillsbury Winthrop Shaw Pittman LLP.
- a. Deposition: 1 (Cumulative total: 58)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 35)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 1 (Cumulative total: 16)
 - c. Technology: LED based light bulbs, LED chips, LED arrays, LED packaging, flip-chip packaging, chip-on-board, heat sinks, GaN, InGaN, AlGaN (Gallium Nitride, Indium Gallium Nitride, Aluminum Gallium Nitride) epitaxial layers, GaN fabrication, LED quantum well active regions, LED cladding layers, optical mirrors, DBRs
132. Active case work: 1Q2022-3Q2022; *Panasonic Corporation, v. Magna International Inc.*, 21-cv-00319 (WD Tex filed 31st Mar 2021.), (retained by plaintiff Magna International) – retained by Sidley Austin LLP.
- a. Deposition: 0 (Cumulative total: 58)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 35)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: Automotive sensors, cameras, electronic circuitry, controls, packaging, surround view camera systems.
133. Active case work: 2Q2022 – 4Q2022; *Jiaxing Super Lighting Electric Appliance Co., LTD and Obert Inc. v. Maxlite Inc.*, 19-CV-04047 (CA C.D. Filed 8th May 2019), (retained by defendant Maxlite Inc) – retained by defendant Procopio, Cory, Hargreaves and Savitch LLP.

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- a. Deposition: 0 (Cumulative total: 58)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 35)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: LED lighting and LED packaging technologies for T8 and T12 form factor tube lighting. Technologies such as LED luminaire/tube packaging, mechanical structure, thermal heat dissipation, electronic circuitry, printed circuit boards, and LED chips.
134. Active case work: 1Q2022 – 4Q2022; *Advanced Engineering Services LLC., v. Lumasense Technologies Inc., and DOES 1-50, 21-CV-03279-WHO* combined with 20-CV-07905-WHO (CA N.D. Filed 23rd Feb 2022), (retained by plaintiff Advanced Engineering Services LLC) – retained by plaintiff SAC Attorneys LLP
- a. Deposition: 1 (Cumulative total: 59)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 35)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: Thermal, gas, and flow sensing for use in designing and manufacturing equipment used in semiconductor chip manufacturing. In particular, review of data relating to the simulation of finite element analysis (“FEA”) and computational fluid dynamics (“CFD”) data for gases, temperature, and stress with actual sensor data that could be intelligently integrated, customized, installed, tested, verified, and validated.
135. Active case work: 2Q2022-3Q2022; *Frontier Communications v. Charter Communications*, Pre-litigation IP and Due Diligence; Case No. TBD; Retained by Frontier Communications, (retained by Mayer Brown LLP)
- a. Deposition: 0 (Cumulative total: 59)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 35)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: Optical PON for high-speed data FTTH evaluation, testing, and analysis.
136. Active case work: 2Q2022-3Q2022; *Russ, August & Kabat*, Pre-litigation IP and Due Diligence; Case No. TBD; (retained by plaintiff – Russ, August & Kabat LLP)
- a. Deposition: 0 (Cumulative total: 59)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 35)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: High volume fiber optic transceivers for EPON/GPON with: CDR circuits, ‘Intelligence-in-the-Module’ and ‘M-ary’ families.
137. Active case work: 2Q2022-3Q2022; *Signify Holding B.V. v. GE Lighting Solutions LLC.*, Declaration for IPR (IPR2022-XXX – in draft form for US patent #7,497,973) as petitioner, (retained by petitioner Signify Holding B.V.) – retained by Alston and Bird LLP
- a. Deposition: 0 (Cumulative total: 59)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 35)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: LED based light bulbs, LED chips that emit in the UV and visible, LED arrays, LED packaging including phosphors and encapsulants, and the type of phosphors utilized for different emission. In particular, phosphors that are activated by dopants such as Europium (Eu), Manganese (Mn) and the associated ions for these materials e.g. Mn²⁺, Mn³⁺, Mn⁴⁺, Mn⁶⁺, etc. Included analysis of InGaN and AlGaIn based epitaxial material systems, and the use of phosphors in high pressure mercury vapor lamps.
138. Active case work: 3Q2022 – 2Q2023; *Canon, Inc., and Canon USA Inc v. WSOU Investments, LLC d/b/a Brazos Licensing and Development.*, Declaration for IPR (IPR2022-01532) for US patent #7,493,030 as petitioner, (retained by Canon Inc) – retained by Orrick LLP
- a. Deposition: 0 (Cumulative total: 59)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 35)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: Digital camera operation including optical focus, image sensing, optical train, depth of field, exposure time, different focus and focal areas of a portion of the image, general photography and optical principles.

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139. Active case work: 3Q2022 – 2Q2023; *Canon, Inc., and Canon USA Inc v. WSOU Investments, LLC d/b/a Brazos Licensing and Development.*, 21-CV- 00166-ADA-DTG (W.D. TX.) Filed 29th Sept 2022. (retained by defendant Canon Inc) – retained by Orrick LLP
- a. Deposition: 1 (Cumulative total: 60)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 35)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: Digital camera operation including optical focus, image sensing, optical train, depth of field, exposure time, different focus and focal areas of a portion of the image, general photography and optical principles.
140. Active case work: 3Q2022 – 4Q2023; *Fujifilm Sonosite., v. Butterfly Network, Inc.*, 1-22-CV-00309 (D. De) Filed 29th Mar 2022), (retained by defendant Butterfly Network, Inc.,) – retained by defendant Akin Gump LLP
- a. Deposition: 0 (Cumulative total: 60)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 35)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: Ultra-sonic equipment that includes displays, especially OLED displays. The electronic circuits and how displays are electronically controlled.
141. Active case work: 3Q2022 – 3Q2023; *LedComm LLC., v. IKEA US Retail LLC et al*, 6-22-CV-00302-ADA (W.D. Tx.) Filed 21st Mar 2022), (retained by defendant IKEA US Retail LLC et al.) – retained by defendant Flaster Greenberg LLP
- a. Deposition: 0 (Cumulative total: 60)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 35)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: LED surface mount packaging, LED GaN/InGaN chips, and associated LED lighting performance specifications.
142. Active case work: 2Q2022 – 3Q2022; *NXP Semiconductors N.V. and NXP USA Inc., v. MediaTek Inc, Amazon.com Inc., Belkin International Inc, Linksys USA Inc., et al*, ITC Investigation 337-TA-1287 entitled “Certain integrated circuits, and electronic devices and products containing the same” (Filed 1st Dec 2021), (retained by respondents Amazon.com Inc.,) – retained by respondent Morrison Foerster LLP
- a. Deposition: 0 (Cumulative total: 60)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 35)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: LED surface mount packaging, LED GaN/InGaN chips, and associated LED lighting performance specifications. LED Luminaires.
143. Active case work: 3Q2022 – 4Q2022; *Amazon.com Inc., v. Epistar Corp.*, 6-22-CV-00526-ADA (W.D. Tx.) Filed 24th May 2022), (retained by defendant Amazon.com Inc.,) – retained by defendant Morrison Foerster LLP
- a. Deposition: 0 (Cumulative total: 60)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 35)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: LED surface mount packaging, LED GaN/InGaN chips, GaN/InGaN epitaxial growth, fabrication, device design and packaging. LED luminaires.
144. Active case work: 4Q2022 – 2Q2023; *Amazon.com Inc., v. Epistar Corp.*, 6-22-CV-00526-ADA (W.D. Tx.) Filed 24th May 2022), (retained by defendant Amazon.com Inc.,) – retained by defendant Perkins Coie LLP
- a. Deposition: 0 (Cumulative total: 60)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 35)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 10)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: LED surface mount packaging, LED GaN/InGaN chips, GaN/InGaN epitaxial growth, fabrication, device design and packaging. LED Luminaires.
145. Active case work: 4Q2022 – 2Q2024; *Qorvo., v. Akoustis Technologies Inc.*, 1-21-CV-1417-JPM (C.A.) Filed 4th Oct 2021), (retained by defendant Akoustis.) – retained by defendant Pillsbury LLP
- a. Deposition: 1 (Cumulative total: 61)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 36)
 - i. ITC trial appearance: 0 (Cumulative total: 8)

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- ii. District Court trial appearance: 1 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: acoustic wave filters, BAW filters (bulk-acoustic-wave) filters for RF applications, devices, fabrication, and characterization. Trade secrets and the misappropriation of trade secrets, confidential information, security policies, and overall development of new technology platforms.
146. Active case work: 4Q2022 – 3Q2023; *LG Electronics Inc., v. TCL Electronics Holdings Ltd. (f/k/a TCL & Multimedia Technology Holdings, Ltd.); & TCL Industries Holdings Co., Ltd.; TCL & Industries Holdings (H.K.) Limited; TTE & Technology, Inc. (d/b/a TCL North & America); TTE Corporation; TCL Moka & International Limited; TCL Moka & Manufacturing S.A. de C.V.; TCL King & Electrical Appliances (Huizhou) Co. Ltd.; & Manufacturas Avanzadas S.A. de C.V.; & TCL Smart Device (Vietnam) Co., Ltd.; & Shenzhen TCL New Technology Co., Ltd.; & TCL Optoelectronics Technology (Huizhou) & Co., Ltd.; TCL Overseas Marketing Ltd.; & and TCL Technology Group Corporation & (f/k/a TCL Corp.), TCL Electronics Holdings Ltd et al., 2-22-CV-0122-JRG (W.D. Tx.) Filed 14th Oct 2022), (retained by plaintiff LGE) – retained by plaintiff counsel Baker Botts LLP*
- a. Deposition: 0 (Cumulative total: 61)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 36)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: BLU and backlighting of displays, especially LCD displays. Optical waveguide, reflecting, and transmission technology, optical sheet materials, optical shapes all utilizing LEDs in various optical package designs.
147. Active case work: 1Q2023 – Present; *NextGen Innovations, LLC v. Nokia of America Corporation et al., 2-22-CV-00309-JRG-RSP (E.D. Tex.)*, (filed: 9th Aug 2022), retained by plaintiff NextGen Innovations LLC., - retained by plaintiff counsel Russ August and Kabat LLP.
- a. Deposition: 0 (Cumulative total: 61)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 36)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: Optical network systems, transceiver modules, passive optical networks, transceiver electronic and optoelectronic components and ICs.
148. Active case work: 1Q2023 – 1Q2023; *NextGen Innovations, LLC v. Infinera et al., 2-22-CV-00306-JRG-RSP (E.D. Tex.)*, (filed: 9th Aug 2022), retained by plaintiff NextGen Innovations LLC., - retained by plaintiff counsel Russ August and Kabat LLP.
- a. Deposition: 1 (Cumulative total: 62)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 36)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: Optical network systems, transceiver modules, passive optical networks, transceiver electronic and optoelectronic components and ICs.
149. Active case work: 3Q2023 – 4Q2023; *Ikea North America Services LLC., Ikea US Retail LLC., v. Everlight Electronics et al, 2-23-CV-00126-ADA (E.D. Tx.) Filed 27th Mar 2023*, (retained by defendant Ikea US Retail LLC et al.) – retained by defendant counsel Flaster Greenberg LLP
- a. Deposition: 0 (Cumulative total: 62)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 36)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: LED surface mount packaging, LED GaN/InGaN chips, and associated LED lighting performance specifications.
150. Active case work: 1Q2023 – 3Q2023; *Jiaxing Super Lighting Electric Appliance Co., LTD and Obert Inc. v. Current Lighting Solutions, LLC d/b/a GE Current., 6-22-CV-00534-ADA (W.D. Tx.) Filed 16th Sep 2022*, (retained by defendant GE Current) – retained by defendant counsel Norton Rose Fulbright US LLP.
- a. Deposition: 0 (Cumulative total: 62)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 36)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: LED lighting and LED packaging technologies for T8 and T12 form factor tube lighting. Technologies such as LED luminaire/tube packaging, mechanical structure, thermal heat dissipation, electronic circuitry, printed circuit boards, and LED chips.

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151. Active case work: 1Q2023 – 2Q2023; *Jiaxing Super Lighting Electric Appliance Co., LTD and Obert Inc. v. Current Lighting Solutions, LLC d/b/a GE Current.*, Declaration for IPR petition (IPR2023-00272) for US patent #10,830,397 as petitioner, (retained by Current Lighting) – retained by counsel Norton Rose Fulbright US LLP.
 - a. Deposition: 0 (Cumulative total: 62)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 36)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: LED lighting and LED packaging technologies for T8 and T12 form factor tube lighting. Technologies such as LED luminaire/tube packaging, mechanical structure, thermal heat dissipation, electronic circuitry, printed circuit boards, and LED chips.
152. Active case work: 1Q2023 – 2Q2023; *Jiaxing Super Lighting Electric Appliance Co., LTD and Obert Inc. v. Current Lighting Solutions, LLC d/b/a GE Current.*, Declaration for IPR petition (IPR2023-00984) for US patent #9,841,174 as petitioner, (retained by Current Lighting) – retained by counsel Norton Rose Fulbright US LLP.
 - a. Deposition: 0 (Cumulative total: 62)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 36)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - d. Technology: LED lighting and LED packaging technologies for T8 and T12 form factor tube lighting. Technologies such as LED luminaire/tube packaging, mechanical structure, thermal heat dissipation, electronic circuitry, printed circuit boards, and LED chips.
153. Active case work: 1Q2023 – 2Q2023; *Jiaxing Super Lighting Electric Appliance Co., LTD and Obert Inc. v. Current Lighting Solutions, LLC d/b/a GE Current.*, Declaration for IPR petition (IPR2023-00983) for US patent #10,487,991 as petitioner, (retained by Current Lighting) – retained by counsel Norton Rose Fulbright US LLP.
 - a. Deposition: 0 (Cumulative total: 62)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 36)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: LED lighting and LED packaging technologies for T8 and T12 form factor tube lighting. Technologies such as LED luminaire/tube packaging, mechanical structure, thermal heat dissipation, electronic circuitry, printed circuit boards, and LED chips.
154. Active case work: 1Q2023 – 2Q2023; *Jiaxing Super Lighting Electric Appliance Co., LTD and Obert Inc. v. Current Lighting Solutions, LLC d/b/a GE Current.*, Declaration for IPR petition (IPR2023-00676) for US patent #9,939,140 as petitioner, (retained by Current Lighting) – retained by counsel Norton Rose Fulbright US LLP.
 - a. Deposition: 0 (Cumulative total: 62)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 36)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: LED lighting and LED packaging technologies for T8 and T12 form factor tube lighting. Technologies such as LED luminaire/tube packaging, mechanical structure, thermal heat dissipation, electronic circuitry, printed circuit boards, and LED chips.
155. Active case work: 1Q2023 – 2Q2023; *US Conec. Ltd. v. Senko Advanced Components Inc.*, 1-23-CV-00083-UNA (D. De). Filed 24th Jan 2023), (retained by defendant US Conec Ltd.) – retained by defendant counsel Troutman Pepper Hamilton Sanders LLP.
 - a. Deposition: 0 (Cumulative total: 62)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 36)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)
 - c. Technology: Fiber optic adapters, fiber optic connectors (simplex, duplex, quad, multi-fiber), fiber trays, racks, and fiber cabinet equipment. Single mode and multimode connector design, and fiber optic connector standards.
156. Active case work: 1Q2023 – 2Q2023; *US Conec. Ltd. v. Senko Advanced Components Inc.*, Declaration for IPR petition (IPR2023-00XXX) for US patent #11,307,369 as petitioner (retained by defendant US Conec Ltd.) – retained by defendant counsel Alston and Bird LLP (pending).
 - a. Deposition: 0 (Cumulative total: 62)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 36)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 16)

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- c. Technology: Fiber optic adapters, fiber optic connectors (simplex, duplex, quad, multi-fiber), fiber trays, racks, and fiber cabinet equipment. Single mode and multimode connector design, and fiber optic connector standards.
- 157. Active case work: 1Q2023 – 2Q2023; *Inneos LLC., v. Opticis Co., Ltd.*, 8-23-CV-00185-JWH-ADS (C.D. Ca). Filed 30th Jan 2023), (retained by plaintiff GE Current) – retained by plaintiff counsel Womble Bond Dickinson (US) LLP.
 - a. Deposition: 1 (Cumulative total: 63)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 37)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 1 (Cumulative total: 17)
 - c. Technology: VCSEL transceiver WDM (wavelength division multiplexing) modules, package design, optics, freeform, diffractive, refractive, and optical filters. Multimode fiber optics designs.
- 158. Active case work: 1Q2023 – 1Q2023; *Viavi Solutions Inc., v Zhejiang Crystal-Optech Co. Ltd.*, 2-21-CV-0378-JRG (E.D. Tx) (filed: 3rd Aug 2022), retained by complainant Viavi Solutions Inc., – retained by counsel Venable, LLP.
 - a. Deposition: 0 (Cumulative total: 63)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 37)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 17)
 - c. Technology: Optical filters and optical sensor systems, design and fabrication of dielectric materials for passband filters in applications such as optical communications, imaging, sensing, medical, automotive.
- 159. Active case work: 1Q2023 – 2Q2023; *Signify North America Corporation and Signify Holding BV., v Satco Products Inc.*, 2-19-CV-06125-JMA-SIL (E.D. NY) (filed: 30th Oct 2022), retained by defendant Satco Products Inc., – retained by defendant counsel Pillsbury Winthrop Shaw Pittman, LLP
 - a. Deposition: 0 (Cumulative total: 63)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 37)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 17)
 - c. Technology: LED backlights, optical techniques for light distribution. Display panels, and LED packaging.
- 160. Active case work: 1Q2023 – 1Q2023; *Becton Dickinson and Company v. Beckman Coulter Inc.*, 1-21-CV-00833-CLC-JFH (D. De), (filed: 3rd Jan 2023), retained by plaintiff Becton Dickinson and Company, - retained by plaintiff counsel Quinn Emanuel Urquhart & Sullivan, LLP.
 - a. Deposition: 0 (Cumulative total: 63)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 37)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 17)
 - c. Technology: Optical filters, sensors, micro-fluidics, lasers, optical test and measurement. Optical instrumentation for fluorescence analysis, characterization of fluorescent material.
- 161. Active case work: 2Q2023 – 2Q2023; *138 East LCD Advancements Limited v. Chongqing HKC Optoelectronics Technology Ltd.*, Declaration for IPR patent owner response (IPR2023-00476) for US patent #7,335,913 as patent owner, (retained by 138 East LCD Advancements Ltd.) – retained by counsel Robins Kaplan LLP
 - a. Deposition: 0 (Cumulative total: 63)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 37)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 17)
 - c. Technology: LCD display layouts, designs for optical and electronic fabrication, design, IC (drivers, electrical wiring, electrodes), and packaging.
- 162. Active case work: 2Q2023 – 2Q2023; *138 East LCD Advancements Limited v. Chongqing HKC Optoelectronics Technology Ltd.*, Declaration for IPR patent owner response (IPR2023-00475) for US patent #7,116,390 as patent owner, (retained by 138 East LCD Advancements Ltd.) – retained by counsel Robins Kaplan LLP
 - a. Deposition: 0 (Cumulative total: 63)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 37)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 17)
 - c. Technology: LCD display layouts, designs for optical and electronic fabrication, design, IC (drivers, electrical wiring, electrodes), and packaging.

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163. Active case work: 2Q2023 – 3Q2023; *Samsung Display Company Limited v. Mianyang BOE Optoelectronics Technology Co., Ltd.*, ITC 337-TA-1351 (filed: 27th Jan 2023), “Certain Active Matrix Organic Light-Emitting Diode Display Panels And Modules For Mobile Devices, And Components Thereof”, (retained by plaintiff Samsung Display Company Ltd.) – retained by counsel Covington and Burling LLP.
- a. Deposition: 0 (Cumulative total: 63)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 37)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. IPR/PTAB trial/deposition: 0 (Cumulative total: 17)
 - c. Technology: Active-matrix OLED display panels and modules for mobile products and devices.
164. Active case work: 2Q2023 – 3Q2023; *Hesai Group, Hesai Technology Co., Ltd. and Hesai Inc. v. Ouster*, ITC 337-TA-1363 (filed: 11th May 2023), “Certain LiDAR (Light Detection And Ranging) Systems And Components Thereof”, (retained by respondent Hesai et al.) – retained by counsel Quinn Emanuel Urquhart & Sullivan, LLP.
- c. Deposition: 1 (Cumulative total: 64)
 - d. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 38)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - e. Technology: Optical and electrical device, optics, and package designs for LIDAR based self-driving vehicles. Rotating LIDAR unit, magnetic rotor/stator design, electronic pcbs, bulk, micro-optics, and optical and electronic system design.
165. Active case work: 4Q2023 – 2Q2024; *Samsung Electronics v. Pictiva Display International*, 2-23-CV-00495-1 (E.D. Tx), (filed: 12th Dec 2022), “Certain LiDAR (Light Detection And Ranging) Systems And Components Thereof”, (retained by defendant Samsung Electronics) – retained by counsel Covington and Burling LLP.
- a. Deposition: 0 (Cumulative total: 64)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 38)
 - i. ITC trial appearance: 0 (Cumulative total: 8)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: Based on OLED displays, color emission, conversion, packaging, optical performance, phosphor characteristics, display panel designs. Patents asserted include: U.S. Patent Nos. 6,949,389 and 8,314,547
166. Active case work: 3Q2023 – 3Q2024; *Innoscence Zhuhai Technology Company, Ltd v. Efficient Power Conversion Corporation (EPC)*, ITC 337-TA-1366 (filed: 3rd July 2023), “Semiconductor Devices and Products Containing the Same”, (retained by respondent Innoscence) – retained by counsel Finnegan, Henderson, Farabow, Garrett & Dunner, LLP.
- a. Deposition: 1 (Cumulative total: 65)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 39)
 - i. ITC trial appearance: 1 (Cumulative total: 9)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: Gallium Nitride (GaN) based power field effect transistors (FETs), their design, fabrication, characterization, and performance. Particular emphasis on enhancement mode GaN FETs and their operation, application, and product development.
167. Active case work: 3Q2023 – 4Q2024; *Innoscence Zhuhai Technology Company, Ltd v. Efficient Power Conversion Corporation (EPC)*, 2-23-CV-04026 (C.D. Ca), (filed: 3rd July 2023), (retained by defendant Innoscence) – retained by counsel Finnegan, Henderson, Farabow, Garrett & Dunner, LLP.
- a. Deposition: 0 (Cumulative total: 65)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 39)
 - i. ITC trial appearance: 0 (Cumulative total: 9)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: Gallium Nitride (GaN) based power field effect transistors (FETs), their design, fabrication, characterization, and performance. Particular emphasis on enhancement mode GaN FETs and their operation, application, and product development.
168. Active case work: 2Q2023 – 4Q2023; *Littlefuse, Inc., v. Mersen USA EP Corp*, USDC D. Mass. Case No. 1:17-CV-12375-IT, (filed: 9th Dec 2022), (retained by defendant Littlefuse) – retained by counsel Bejin Bieneman PLC (“B2IP”).
- a. Deposition: 0 (Cumulative total: 65)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 39)
 - i. ITC trial appearance: 0 (Cumulative total: 9)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)

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- c. Technology: Electrical fuse technology, with extruded metal and alloys, design of mechanical structure. Application with solar cell industrial equipment.
- 169. Active case work: 2Q2023 – 1Q2025; *Immervision, v. Apple Inc.*, 1:21-CV-01484, (D. De.), (filed: 28th April 2022), (retained by plaintiff) – retained by counsel Panitch Schwarze Belisario & Nadel LLP.
 - a. Deposition: 0 (Cumulative total: 65)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 39)
 - i. ITC trial appearance: 0 (Cumulative total: 9)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: Optical lenses for ultra-wide angle imaging including wide angle panomorph lenses, imaging techniques, and design of the optics. Application market verticals include mobile phones, portable display accessories and other portable consumer equipment.
- 170. Active case work: 2Q2023 – 3Q2023; *Samsung v. Apt-ability dba d/b/a Mobile Sentrix et al*, ITC 337-TA-1351 (filed: 3rd July 2023), “Certain Active Matrix Organic Light-Emitting Diode Display Panels And Modules For Mobile Devices, And Components Thereof”, (retained by respondent Samsung) – retained by counsel Covington and Burling, LLP.
 - a. Deposition: 0 (Cumulative total: 65)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 39)
 - i. ITC trial appearance: 0 (Cumulative total: 9)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: OLED display panels for mobile devices including display electronics, backlights, panel design, and OLED pixel fabrication. Emphasis on pixel shape, layout and display pixel structure.
- 171. Active case work: 1Q2024 – 1Q2024; *Immervision, v. Apple Inc.*, Declaration for IPR patent owner response (IPR2023-00472) for US patent #10,795,120 as patent owner, (retained by plaintiff) – retained by counsel Panitch Schwarze Belisario & Nadel LLP.
 - a. Deposition: 0 (Cumulative total: 65)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 39)
 - i. ITC trial appearance: 0 (Cumulative total: 9)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: Optical lenses for ultra-wide angle imaging including wide angle panomorph lenses, imaging techniques, and design of the optics. Application market verticals include mobile phones, portable display accessories and other portable consumer equipment.
- 172. Active case work: 1Q2024 – 4Q2024; *Innoscence Zhuhai Technology Company, Ltd v. Infineon*, Declaration for IPR petitioner response (IPR2024-00975) for US patent #9,899,481 as petitioner, (retained by defendant Innoscence) – retained by counsel Finnegan, Henderson, Farabow, Garrett & Dunner, LLP.
 - a. Deposition: 0 (Cumulative total: 65)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 39)
 - i. ITC trial appearance: 0 (Cumulative total: 9)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: Gallium Nitride (GaN) based power field effect transistors (FETs), their design, fabrication, characterization, and performance. Particular emphasis on enhancement mode GaN FETs and their operation, application, and product development.
- 173. Active case work: 1Q2023 – 4Q2024; *Polaris Powerled Technologies llc (plaintiff), v. Samsung Electronics America Inc, Samsung Display Company Ltd, Samsung Electronics Company, Ltd. (defendants)*, 2:22-CV-00469-JRG, (E.D. Tx.), (filed: 28th June 2023), (retained by defendant) – retained by counsel Baker Botts LLP.
 - a. Deposition: 1 (Cumulative total: 66)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 39)
 - i. ITC trial appearance: 0 (Cumulative total: 9)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - d. Technology: OLED displays, OLED driver circuits, OLED red, green, blue pixels and associated display design and packaging technologies. Tear down of OLED displays for consumer cameras.
- 174. Active case work: 2Q2024 – 3Q2024; *Ikea North America Services LLC., Ikea US Retail LLC., v. Everlight Electronics et al.*; Declaration for IPR patent owner response (IPR2024-00XXXX) for US patent #9,640,733 as petitioner, (retained by defendant Ikea US Retail LLC et al.) – retained by defendant counsel Flaster Greenberg LLP
 - a. Deposition: 0 (Cumulative total: 66)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 39)
 - i. ITC trial appearance: 0 (Cumulative total: 9)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)

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- c. Technology: LED surface mount packaging, LED GaN/InGaN chips, and associated LED lighting performance specifications.
- 175. Active case work: 2Q2024 – 3Q2024; *Ikea North America Services LLC., Ikea US Retail LLC., v. Everlight Electronics et al.*; Declaration for IPR patent owner response (IPR2024-00XXXX) for US patent #7,554,126 as petitioner, (retained by defendant Ikea US Retail LLC et al.) – retained by defendant counsel Flaster Greenberg LLP
 - a. Deposition: 0 (Cumulative total: 66)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 39)
 - i. ITC trial appearance: 0 (Cumulative total: 9)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: LED surface mount packaging, LED GaN/InGaN chips, and associated LED lighting performance specifications.
- 176. Active case work: 3Q2024 – 1Q2025; *Semisilicon Technology Group v. Xu Peicheng (Hong Kong) Optoelectronic Technology Co. Limited*; Declaration for IPR patent owner response (IPR2024-00156) for US patent #8,884,546, (retained by defendant SemiSilicon Technology Group) – retained by defendant counsel Finnegan LLP
 - a. Deposition: 0 (Cumulative total: 66)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 39)
 - i. ITC trial appearance: 0 (Cumulative total: 9)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: LED surface mount and through-pin packaging (3/5mm as well as surface mount packages), COB (chip-on-board), flexible boards, LED GaN/InGaN chips, and associated LED control chips/slave chips, synchronous logic operation for LED strings and string architectures.
- 177. Active case work: 3Q2024 – 1Q2025; *Semisilicon Technology Group v. Xu Peicheng (Hong Kong) Optoelectronic Technology Co. Limited*; Declaration for reexam (RE) patent owner (Reexamination control #90/015,328 for US patent #8,124,988), (retained by defendant SemiSilicon Technology Group) – retained by defendant counsel Finnegan LLP
 - a. Deposition: 0 (Cumulative total: 66)
 - b. Trial/Hearing/court/PTAB appearance (reexam interview): 1 (Cumulative total: 40)
 - i. ITC trial appearance: 0 (Cumulative total: 9)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 1 (Cumulative total: 19)
 - c. Technology: LED surface mount and through-pin packaging (3/5mm as well as surface mount packages), COB (chip-on-board), flexible boards, LED GaN/InGaN chips, and associated LED lighting performance specifications including waterproofing.
- 178. Active case work: 1Q2023 – 4Q2023; *Samsung v. BOE Technology Group Ltd, BMOT f/k/a Kunming BOE Display Technology, BOE Technology America Inc., Chengdu BOE Optoelectronics Technology Co., Ltd., Chongqing BOE Optoelectronics Technology Co., Ltd., Mianyang BOE Optoelectronics Technology Co., Ltd., Ordos Yuansheng Optoelectronics Co., Ltd., Wuhan BOE Optoelectronics Technology Co., Ltd., ITC 337-TA-1378* (filed: 31st October 2023), “Certain Organic Light-Emitting Diode Display Modules and Components Thereof”, (retained by Complainant Samsung) – retained by counsel Quinn Emanuel, LLP.
 - a. Deposition: 2 (Cumulative total: 68)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 41)
 - i. ITC trial appearance: 1 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: Manufacturing of OLED display panels (both half 6G carrier glass FMM (fine metal mask) mobile OLEDs and silicon based micro-OLEDs) for mobile devices including fabrication process, tool design, factory layout, technical yield performance, evaporation, encapsulation, pixel formation, cell cutting using CO₂ lasers, etc. Emphasis on trade secrets and the misappropriation of trade secrets.
- 179. Active case work: 4Q2024 – 2Q2025; *Innoscence (Suzhou) Technology Company, Ltd.; Innoscience Zhuhai Technology Company, Ltd., and Innoscience America Inc., v. Infineon Technologies Austria AG., (defendants) 3-24-CV-01553* (N.D. Cal.), (retained by defendant Innoscience) – retained by counsel Finnegan, Henderson, Farabow, Garrett & Dunner, LLP.
 - a. Deposition: 0 (Cumulative total: 68)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: Gallium Nitride (GaN) based power field effect transistors (FETs), their design, fabrication, characterization, and performance. Particular emphasis on enhancement mode GaN FETs and their operation, application, and product development.

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180. Active case work: 4Q2024 – 1Q2025; *Innoscience (Suzhou) Technology Company, Ltd.; Innoscience Zhuhai Technology Company, Ltd., and Innoscience America Inc., v. Infineon Technologies Austria AG.*, ITC 337-TA-3763 (filed: 26th July 2024), “*Certain Semiconductor Devices and Products Containing the Same*”, International Trade Commission), (retained by respondent Innoscience) – retained by counsel Finnegan, Henderson, Farabow, Garrett & Dunner, LLP.
- a. Deposition: 0 (Cumulative total: 68)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - a. Technology: Gallium Nitride (GaN) based power field effect transistors (FETs), their design, fabrication, characterization, and performance. Particular emphasis on enhancement mode GaN FETs and their operation, application, and product development.
181. Active case work: 3Q2024 – 2Q2025; *Samsung Electronics Co., Ltd.; Samsung Electronics America, Inc.; and Samsung Semiconductor, Inc. v. SiOnyx, LLC.*, ITC 337-TA-1403 (filed: 30th April 2024), “*Certain Sensors with Pixels and Products Containing Same*”, International Trade Commission), (retained by respondent Samsung) – retained by counsel Covington and Burling, LLP.
- a. Deposition: 0 (Cumulative total: 68)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - a. Technology: Silicon sensors and pixels for CMOS sensors with silicon fabrication that includes impact, wafer bonding, dielectric doping, wet and dry etching, passivation, optics, optical reflection, optical refraction, as well as general device characteristics for arrays.
182. Active case work: 3Q2024 – 2Q2025; *Samsung Electronics Co., Ltd.; Samsung Electronics America, Inc.; and Samsung Semiconductor, Inc. v. SiOnyx, LLC.*, Declaration for IPR patent owner response (IPR2024-01431) for US patent #11,069,737, (retained by defendant Samsung) – retained by defendant counsel Covington and Burling, LLP.
- a. Deposition: 0 (Cumulative total: 68)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - a. Technology: Silicon sensors and pixels for CMOS sensors with silicon fabrication that includes impact, wafer bonding, dielectric doping, wet and dry etching, passivation, optics, optical reflection, optical refraction, as well as general device characteristics for arrays.
183. Active case work: 3Q2024 – 2Q2025; *Samsung Electronics Co., Ltd.; Samsung Electronics America, Inc.; and Samsung Semiconductor, Inc. v. SiOnyx, LLC.*, Declaration for IPR patent owner response (IPR2024-XXXXXX) for US patent #10,347,682, (retained by defendant Samsung) – retained by defendant counsel Covington and Burling, LLP.
- c. Deposition: 0 (Cumulative total: 68)
 - d. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - a. Technology: Silicon sensors and pixels for CMOS sensors with silicon fabrication that includes impact, wafer bonding, dielectric doping, wet and dry etching, passivation, optics, optical reflection, optical refraction, as well as general device characteristics for arrays.
184. Active case work: 3Q2024 – 2Q2025; *Samsung Electronics Co., Ltd.; Samsung Electronics America, Inc.; and Samsung Semiconductor, Inc. v. SiOnyx, LLC.*, Declaration for IPR patent owner response (IPR2024-XXXXXX) for US patent #11,721,714, (retained by defendant Samsung) – retained by defendant counsel Covington and Burling, LLP.
- e. Deposition: 0 (Cumulative total: 68)
 - f. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - a. Technology: Silicon sensors and pixels for CMOS sensors with silicon fabrication that includes impact, wafer bonding, dielectric doping, wet and dry etching, passivation, optics, optical reflection, optical refraction, as well as general device characteristics for arrays.
185. Active case work: 4Q2024 – 2Q2025; *Commscope Inc., Commscope Inc. of North Carolina, and Commscope Technologies LLC v. Belden Canada ULC., (plaintiff)* 1-22-CV-00782 (D. Del.), (retained by defendant Commscope) – retained by counsel Carlson Caspers, LLP.

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- a. Deposition: 2 (Cumulative total: 70)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: Electronic and electrical connectors, specifically RJ-45 and associated structure, operation, pins, springs, polymer molding and operational characteristics.
186. Active case work: 3Q2023 – 3Q2023; *Hesai Group, Hesai Technology Co., Ltd. and Hesai Inc. v. Ouster*, Declaration for IPR patent owner response (IPR2023-01422) for US patent #11,287,515, (retained by petitioner Hesai) – retained by petitioner counsel Quinn Emanuel, LLP.
- a. Deposition: 0 (Cumulative total: 70)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: Optical and electrical device, optics, and package designs for LIDAR based self-driving vehicles. Rotating LIDAR unit, magnetic rotor/stator design, electronic pcbs, bulk, micro-optics, and optical and electronic system design.
187. Active case work: 3Q2024 – 3Q2024; *Acuity Brands Lighting, Inc., v. Seoul Semiconductor Co. Ltd., and Seoul Viosys Co. Ltd.*, Exploration for IPR (IPR2024-XXXXX) for US patent #x,xxx,xxx (retained by Acuity Brands Lighting, Inc.) – retained by counsel Duane Morris, LLP.
- g. Deposition: 0 (Cumulative total: 70)
 - h. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - a. Technology: LED lighting, LED devices, light characteristics, luminaires, GaN blue LED chips and associated SMT packaging.
188. Active case work: 4Q2024 – 2Q2025; *Maxell Ltd., (plaintiff) v. Coretronic Corp., and Optoma Corp.*, 5-24-CV-00088-RWS-JBB (E.D. Tx.), (retained by plaintiff Mexell) – retained by counsel Mayer Brown, LLP
- a. Deposition: 2 (Cumulative total: 72)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: Laser projection display systems, filters, optical beams, lenses, components, organic phosphor material, wavelength conversion, lighting properties.
189. Active case work: 1Q2025 – present; *Credo AI Corporation, (Defendant) v. Credo Technology Group*), 3-24-CV-02032-CRB (N.D. Ca.), filed 28th October 2024, (retained by defendant Credo AI Corp.) – retained by counsel Pranger Law, PC
- a. Deposition: 0 (Cumulative total: 72)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: Artificial Intelligence (AI) hardware for data center applications, DSP and ASIC chips, SerDes and retimer chips, AECs (Active Electric Cables), AOC chips and chipsets, digital signal processors, PCIe technology, servers, routers, chassis fiber management, pluggable transceiver modules.
190. Active case work: 1Q2025 – present; *Advanced Integrated Circuit Process (AICP) LLC, (plaintiff) v. United Microelectronics Corporation (UMC) and Taiwan Semiconductor Manufacturing Company (TSMC) Ltd.*, 2-24-CV-00730-JRG (E.D. Tx.), filed 20th March 2024, (retained by plaintiff AICP) – retained by counsel Susman Godfrey LLP
- a. Deposition: 0 (Cumulative total: 72)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: CMOS process fabrication technology, implant techniques, dielectric depositions and sputtering, metallization, CMOS FET operation, CMOS FET design
191. Active case work: 1Q2025 – 2Q2025; *REC Solar (defendant) v. Maxeon Solar Pte. Ltd.*, 2-24-CV-00260 (E.D. Tx.), filed 19th April 2024, (retained by defendant REC Solar) – retained by counsel Finnegan LLP
- a. Deposition: 0 (Cumulative total: 72)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)

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- i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: Silicon solar cell design, TopCon technology, fabrication and processing techniques, implants, diffusion, tunneling junctions, tunneling mechanisms.
- 192. Active case work: 3Q2024 – 2Q2025; Samsung Electronics Co. Ltd., Samsung Electronics America Inc., Samsung Semiconductor Inc., and Samsung Austin Semiconductor LLC., (petitioner) v. *W & W Sens Devices Inc.*, IPR (IPR2025-XXXXXX) for US patent #10,446,700 (retained by Samsung Electronics Co., Ltd.) – retained by counsel Finnegan, LLP.
 - a. Deposition: 0 (Cumulative total: 72)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - c. Photodetectors, quantum efficiency, microstructure enhanced photodetectors, integrated devices, arrays of photodetectors, active electronic circuits, monolithic integration, holes for collecting photons, band-pass filters, SiGe, BiCMOS, CMOS, III-V materials fabrication and processing. Fabrication of pillars and pillar-holes.
- 193. Active case work: 3Q2024 – 2Q2025; Samsung Electronics Co. Ltd., Samsung Electronics America Inc., Samsung Semiconductor Inc., and Samsung Austin Semiconductor LLC., (petitioner) v. *W & W Sens Devices Inc.*, IPR (IPR2025-XXXXXX) for US patent #10,468,543 (retained by Samsung Electronics Co., Ltd.) – retained by counsel Finnegan, LLP.
 - a. Deposition: 0 (Cumulative total: 72)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - c. Photodetectors, quantum efficiency, microstructure enhanced photodetectors, integrated devices, arrays of photodetectors, active electronic circuits, monolithic integration, holes for collecting photons, band-pass filters, SiGe, BiCMOS, CMOS, III-V materials fabrication and processing. Fabrication of pillars and pillar-holes.
- 194. Active case work: 3Q2024 – 2Q2025; Samsung Electronics Co. Ltd., Samsung Electronics America Inc., Samsung Semiconductor Inc., and Samsung Austin Semiconductor LLC., (petitioner) v. *W & W Sens Devices Inc.*, IPR (IPR2025-XXXXXX) for US patent #11,621,360 (retained by Samsung Electronics Co., Ltd.) – retained by counsel Finnegan, LLP.
 - a. Deposition: 0 (Cumulative total: 72)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - c. Photodetectors, quantum efficiency, microstructure enhanced photodetectors, integrated devices, arrays of photodetectors, active electronic circuits, monolithic integration, holes for collecting photons, band-pass filters, SiGe, BiCMOS, CMOS, III-V materials fabrication and processing. Fabrication of pillars and pillar-holes.
- 195. Active case work: 4Q24 – 1Q2025; Abalance Corporation (defendant) v. Shanghai Jinko Green Entergy Enterprise Management Co., Ltd., 3-24-CV-08828-JSC (N.D. Ca.), filed 6th December 2024, (retained by defendant Abalance Corporation (together with WWB Corporation, Fuji Solar Co. Ltd., VSEUN Solar USA inc., TOYO Co. Ltd., and TOYO Solar Company Ltd., f/k/a Vietnam Sunergy cell Company Ltd and Vietnam Sunergy (Bac Ninh) Company Ltd.)) – retained by counsel Sidley Austin LLP
 - a. Deposition: 0 (Cumulative total: 72)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: Silicon solar cell design, TopCon technology, structured substrates, textured surfaces, pyramid structures fabricated in silicon, fabrication and processing techniques, implants, diffusion, tunneling junctions, tunneling mechanisms.
- 196. Active case work: 4Q24 – 1Q25; John Alms (plaintiff) v. Luminar Technologies Inc., Mike McAuliffe, Austin Russell, and Jason Eichenholz, 6-23-CV-00982-PGB-LHP (M.D. Fl.), filed 26th May 2023, (retained by plaintiff John Alms) – retained by counsel Sidley Austin LLP
 - a. Deposition: 0 (Cumulative total: 72)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: Lidar sensors, DFB laser chips and laser design, photonic packaging, photonic integrated circuits (PICs), optical sensors, LIDAR components.

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197. Active case work: 4Q2024 – 1Q2025; Green Creative LLC and Industrial Lighting Products LLC (petitioner) v. *Seoul semiconductor Co. Ltd.*, IPR (IPR2025-00654) for US patent #8,963,196 (retained by Green Creative LLC) – retained by counsel Duane Morris, LLP.
- a. Deposition: 0 (Cumulative total: 72)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. LEDs, solid state lighting, LED devices, LED packages, electrically connecting LEDs and packages, grooves and openings within the LED packaging, slim LED packages.
198. Active case work: 4Q24 – 2Q25; Harbor Island Dynamic LLC v. Samsung Electronics Co. Ltd., and Samsung Electronics America Inc., (defendant) 2-24-CV-00140-JRG-RSP (M.D. Fl.), filed 27th February 2024, (retained by defendant Samsung Electronics) – retained by counsel Finnegan LLP
- a. Deposition: 0 (Cumulative total: 72)
 - b. Trial/Hearing/court/PTAB appearance: 0 (Cumulative total: 41)
 - i. ITC trial appearance: 0 (Cumulative total: 10)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - c. Technology: VLSI layouts, chamfers, bevels, trenches, STI trenches, anchor vias, via design, TSVs silicon vias, cascaded transistors
199. Active case work: 2Q2024 – 2Q2025; *Innoscence America, Inc., Innoscence Zhuhai Technology Company, Lt., Innoscence (Suzhou) Semiconductor Co., Ltd. Innoscence (Suzhou) Technology Company, Ltd., Innoscence (Suzhou) Technology Holding Co., Ltd., (respondent) v. Infineon Technologies Americas Corp., and Infineon Technologies Austria AG.*, ITC 337-TA-1414 (filed: 26th July 2024), “Certain Semiconductor Devices and Products Containing the Same”, (retained by respondent Innoscence) – retained by counsel Finnegan, Henderson, Farabow, Garrett & Dunner, LLP.
- a. Deposition: 1 (Cumulative total: 73)
 - b. Trial/Hearing/court/PTAB appearance: 1 (Cumulative total: 42)
 - i. ITC trial appearance: 1 (Cumulative total: 11)
 - ii. District Court trial appearance: 0 (Cumulative total: 11)
 - iii. PTAB Court trial/deposition appearance: 0 (Cumulative total: 18)
 - d. Technology: Gallium Nitride (GaN) based power field effect transistors (FETs), their design, fabrication, characterization, and performance. Particular emphasis on device design and packaging of high voltage, high power GaN FETs and their operation, application, and product development. Interdigitated fingers for source and drain contacts, refractory metallization, electrodes, ohmic contacts, non-co-planar drain electrodes.

ISSUED utility PATENTS and PUBLISHED PATENT APPLICATIONS ISSUED:

Current combined total = 341

Dr. Lebby holds over 500 issued international patents (as per search engine) in photonics and electronics, that have been derived from over 230 issued USPTO utility patents, mostly in the field of optoelectronics, photonics, and semiconductors. He has been cited by the USPTO to be in the most prolific 75 inventors in USA from 1988-1997.

Recent activity (data center applications, high-performance computing, data communications related patents highlighted in italics)

1	US-11974508-B2	Preview PDF	<i>Josephson Junction using molecular beam epitaxy</i>
2	US-11927868-B2	Preview PDF	<i>Electro-optic polymer devices having high performance claddings, and methods of preparing the same</i>

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3	US-11757008-B2	Preview PDF	<i>Electronic device with 2-dimensional electron gas between polar-oriented rare-earth oxide layer grown over a semiconducting layer</i>
4	US-20230280605-A1	Preview PDF	<i>SLOT MODULATORS WITH IMPROVED RF AND BANDWIDTH PERFORMANCE</i>
5	US-20230251543-A1	Preview PDF	<i>Electro-Optic Polymer Devices Having High Performance Claddings, and Methods of Preparing the Same</i>
6	US-20230172075-A1	Preview PDF	<i>Axis Josephson Junctions with Improved Smoothness</i>

Listed patents and patent applications (data center applications, high-performance computing, data communications related patents highlighted in italics)

1	US-11614670-B2	Preview PDF	<i>Electro-optic polymer devices having high performance claddings, and methods of preparing the same</i>	Yi; Youngwoo et al.	2023-03-28	21
2	US-11520175-B2	Preview PDF	<i>Active region-less modulator and method</i>	Lebby; Michael et al.	2022-12-06	62
3	US-11506918-B2	Preview PDF	<i>Hybrid EO polymer modulator with ALD sealant layer</i>	Lebby; Michael et al.	2022-11-22	18
4	US-11495670-B2	Preview PDF	<i>Integrated epitaxial metal electrodes</i>	Pelzel; Rodney et al.	2022-11-08	25
5	US-11435603-B2	Preview PDF	<i>TFP optical transition device and method</i>	Leonberger; Frederick J. et al.	2022-09-06	32
6	US-11435604-B2	Preview PDF	<i>Hybrid EO polymer modulator with silicon photonics</i>	Lebby; Michael et al.	2022-09-06	21
7	US-20220246822-A1	Preview PDF	<i>Josephson Junction using Molecular Beam Epitaxy</i>	Lebby; Michael S. et al.	2022-08-04	10
8	US-20220187638-A1	Preview PDF	<i>HYBRID EO POLYMER MODULATOR WITH ALD SEALANT LAYER</i>	Lebby; Michael et al.	2022-06-16	18
9	US-20220187637-A1	Preview PDF	<i>HYBRID EO POLYMER MODULATOR WITH SILICON PHOTONICS</i>	Lebby; Michael et al.	2022-06-16	22

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10 US-20220113566-A1	Preview PDF	TFP OPTICAL TRANSITION DEVICE AND METHOD	Leonberger; Frederick J. et al.	2022-04-14	32
11 US-11262605-B2	Preview PDF	Active region-less polymer modulator integrated on a common PIC platform and method	Lebby; Michael et al.	2022-03-01	32
12 US-20220052249-A1	Preview PDF	A-axis Josephson Junctions with Improved Smoothness	Lebby; Michael S. et al.	2022-02-17	40
13 US-11201278-B2	Preview PDF	Josephson Junction using molecular beam epitaxy	Lebby; Michael S. et al.	2021-12-14	10
14 US-11201451-B2	Preview PDF	Porous distributed Bragg reflectors for laser applications	Hammond; Rich et al.	2021-12-14	20
15 US-11067748-B2	Preview PDF	Guide transition device and method	Lebby; Michael et al.	2021-07-20	24
16 US-11063114-B2	Preview PDF	III-N to rare earth transition in a semiconductor structure	Dargis; Rytis et al.	2021-07-13	23
17 US-11042051-B2	Preview PDF	Direct drive region-less polymer modulator methods of fabricating and materials therefor	Lebby; Michael et al.	2021-06-22	25
18 US-20210141251-A1	Preview PDF	ACTIVE REGION-LESS MODULATOR AND METHOD	Lebby; Michael et al.	2021-05-13	63
19 US-20210141250-A1	Preview PDF	ACTIVE REGION-LESS MODULATOR AND METHOD	Lebby; Michael et al.	2021-05-13	29
20 US-10989871-B2	Preview PDF	Protection layers for polymer modulators/waveguides	Becker; Richard et al.	2021-04-27	12
21 US-20210005720-A1	Preview PDF	ELECTRONIC DEVICE WITH 2-DIMENSIONAL ELECTRON GAS BETWEEN POLAR-ORIENTED RARE-EARTH OXIDE LAYER GROWN OVER A SEMICONDUCTOR	Dargis; Rytis et al.	2021-01-07	23
22 US-10886694-B2	Preview PDF	Hermetic capsule and method	Lebby; Michael	2021-01-05	17
23 US-10825912-B2	Preview PDF	Integrated epitaxial metal electrodes	Pelzel; Rodney et al.	2020-11-03	20

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24 US-20200285085-A1	Preview PDF	<i>DIRECT DRIVE REGION-LESS POLYMER MODULATOR METHODS OF FABRICATING AND MATERIALS THEREFOR</i>	Lebby; Michael et al.	2020-09-10	25
25 US-10754093-B2	Preview PDF	<i>Fabrication process of polymer based photonic apparatus and the apparatus</i>	Liu; Zhiming et al.	2020-08-25	12
26 US-20200183201-A1	Preview PDF	<i>ACTIVE REGION-LESS POLYMER MODULATOR INTEGRATED ON A COMMON PIC PLATFORM AND METHOD</i>	Lebby; Michael et al.	2020-06-11	31
27 US-20200183245-A1	Preview PDF	<i>ELECTRO-OPTIC POLYMER DEVICES HAVING HIGH PERFORMANCE CLADDINGS, AND METHODS OF PREPARING THE SAME</i>	Yi; Youngwoo et al.	2020-06-11	21
28 US-20200161417-A1	Preview PDF	<i>III-N TO RARE EARTH TRANSITION IN A SEMICONDUCTOR STRUCTURE</i>	Dargis; Rytis et al.	2020-05-21	20
29 US-20200150363-A1	Preview PDF	<i>CONDUCTIVE MULTI-FIBER/PORT HERMETIC CAPSULE AND METHOD</i>	Lebby; Michael	2020-05-14	27
30 US-20200119516-A1	Preview PDF	<i>HERMETIC CAPSULE AND METHOD</i>	Lebby; Michael	2020-04-16	16
31 US-10615141-B2	Preview PDF	<i>Snitide buffer structures and devices for GaN base applications</i>	Clark; Andrew et al.	2020-04-07	16
32 US-10605987-B2	Preview PDF	<i>Re-based integrated photonic and electronic layered structures</i>	Clark; Andrew et al.	2020-03-31	42
33 US-20200091398-A1	Preview PDF	<i>JOSEPHSON JUNCTION USING MOLECULAR BEAM EPITAXY</i>	Lebby; Michael S. et al.	2020-03-19	10
34 US-20200088939-A1	Preview PDF	<i>GUIDE TRANSITION DEVICE AND METHOD</i>	Lebby; Michael et al.	2020-03-19	23
35 US-20200088941-A1	Preview PDF	<i>PROTECTION LAYERS FOR POLYMER MODULATORS/WAVEGUIDES</i>	Becker; Richard et al.	2020-03-19	12
36 US-10591755-B2	Preview PDF	<i>Direct-drive polymer modulator methods of fabricating and materials therefor</i>	Becker; Richard et al.	2020-03-17	20
37 US-20200083668-A1	Preview PDF	<i>GUIDE TRANSITION DEVICE WITH DIGITAL GRATING DEFLECTORS AND METHOD</i>	Lebby; Michael et al.	2020-03-12	15

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38	US-10573686-B2	Preview	PDF Epitaxial AlN/cREO structure for RF filter applications	Wang; Wang Nang et al.	2020-02-25	19
39	US-10574025-B2	Preview	PDF Hermetic capsule and method for a monolithic photonic integrated circuit	Lebby; Michael	2020-02-25	17
40	US-10566944-B2	Preview	PDF Layer structures for RF filters fabricated using rare earth oxides and epitaxial aluminum nitride	Pelzel; Rodney et al.	2020-02-18	28
41	US-10527786-B2	Preview	PDF Polymer modulator and laser integrated on a common platform and method	Leonberger; Frederick J et al.	2020-01-07	27
42	US-10520673-B2	Preview	PDF Protection layers for polymer modulators/waveguides	Becker; Richard et al.	2019-12-31	12
43	US-10509164-B2	Preview	PDF Guide transition device and method	Lebby; Michael et al.	2019-12-17	23
44	US-10511146-B2	Preview	PDF Guide transition device with digital grating deflectors and method	Lebby; Michael et al.	2019-12-17	16
45	US-20190353843-A1	Preview	PDF FABRICATION PROCESS OF POLYMER BASED PHOTONIC APPARATUS AND THE APPARTUS	Liu; Zhiming et al.	2019-11-21	12
46	US-20190305039-A1	Preview	PDF EPITAXIAL AlN/cREO STRUCTURE FOR RF FILTER APPLICATIONS	Wang; Wang Nang et al.	2019-10-03	18
47	US-10431729-B2	Preview	PDF Josephson junction using molecular beam epitaxy	Lebby; Michael S. et al.	2019-10-01	10
48	US-20190278036-A1	Preview	PDF EMBEDDED HERMETIC CAPSULE AND METHOD	Lebby; Michael	2019-09-12	22
49	US-20190237930-A1	Preview	PDF HERMETIC CAPSULE AND METHOD	Lebby; Michael	2019-08-01	17
50	US-20190227233-A1	Preview	PDF RE-based Integrated Photonic and Electronic Layered Structures	Clark; Andrew et al.	2019-07-25	41
51	US-20190221993-A1	Preview	PDF POROUS DISTRIBUTED BRAGG REFLECTORS FOR LASER APPLICATIONS	Hammond; Rich et al.	2019-07-18	19

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52	US-20190204506-A1	Preview PDF	<i>PROTECTION LAYERS FOR POLYMER MODULATORS/WAVEGUIDES</i>	Becker; Richard et al.	2019-07-04	12
53	US-10332857-B2	Preview PDF	Rare earth pnictides for strain management	Clark; Andrew et al.	2019-06-25	30
54	US-20190172923-A1	Preview PDF	<i>Integrated Epitaxial Metal Electrodes</i>	Pelzel; Rodney et al.	2019-06-06	24
55	US-20190148913-A1	Preview PDF	<i>GUIDE TRANSITION DEVICE WITH DIGITAL GRATING DEFLECTORS AND METHOD</i>	Lebby; Michael et al.	2019-05-16	16
56	US-20190139761-A1	Preview PDF	Pnictide Buffer Structures and Devices for GaN Base Applications	Clark; Andrew et al.	2019-05-09	15
57	US-20190122885-A1	Preview PDF	GROUP III SEMICONDUCTOR EPITAXY FORMED ON SILICON VIA SINGLE CRYSTAL REN AND REO BUFFER LAYERS	Dargis; Rytis et al.	2019-04-25	13
58	US-20190079243-A1	Preview PDF	<i>GUIDE TRANSITION DEVICE AND METHOD</i>	Lebby; Michael et al.	2019-03-14	24
59	US-20190074365-A1	Preview PDF	<i>Integrated Epitaxial Metal Electrodes</i>	Pelzel; Rodney et al.	2019-03-07	20
60	US-20190064436-A1	Preview PDF	<i>POLYMER MODULATOR AND LASER INTEGRATED ON A COMMON PLATFORM AND METHOD</i>	Leonberger; Frederick J et al.	2019-02-28	26
61	US-20190028081-A1	Preview PDF	<i>LAYER STRUCTURES FOR RF FILTERS FABRICATED USING RARE EARTH OXIDES AND EPITAXIAL ALUMINUM NITRIDE</i>	Pelzel; Rodney et al.	2019-01-24	28
62	US-10162111-B1	Preview PDF	<i>Multi-fiber/port hermetic capsule sealed by metallization and method</i>	Lebby; Michael	2018-12-25	34
63	US-10128350-B2	Preview PDF	<i>Integrated epitaxial metal electrodes</i>	Pelzel; Rodney et al.	2018-11-13	20
64	US-20180259798-A1	Preview PDF	<i>DIRECT-DRIVE POLYMER MODULATOR METHODS OF FABRICATING AND MATERIALS THEREFOR</i>	Becker; Richard et al.	2018-09-13	20
65	US-10075143-B2	Preview PDF	Layer structures for RF filters fabricated using rare earth oxides and epitaxial aluminum nitride	Pelzel; Rodney et al.	2018-09-11	29
66	US-20180138284-A1	Preview PDF	<i>Integrated Epitaxial Metal Electrodes</i>	Pelzel; Rodney et al.	2018-05-17	19
67	US-20180012858-A1	Preview PDF	RARE EARTH INTERLAYS FOR MECHANICALLY LAYERING DISSIMILAR SEMICONDUCTOR WAFERS	Clark; Andrew et al.	2018-01-11	15
68	US-20180013053-A1	Preview PDF	<i>Josephson Junction using Molecular Beam Epitaxy</i>	Lebby; Michael S. et al.	2018-01-11	10
69	US-20170353002-A1	Preview PDF	Rare Earth Pnictides for Strain Management	Clark; Andrew et al.	2017-12-07	29
70	US-20170141750-A1	Preview PDF	LAYER STRUCTURES FOR RF FILTERS FABRICATED USING RARE EARTH OXIDES AND EPITAXIAL ALUMINUM NITRIDE	Pelzel; Rodney et al.	2017-05-18	29

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71	US-9496132-B2	Preview PDF	Nucleation of III-N on REO templates	Arkun; Erdem et al.	2016-11-15	9
72	US-9443939-B2	Preview PDF	Strain compensated REO buffer for III-N on silicon	Dargis; Rytis et al.	2016-09-13	7
73	US-20160133708-A1	Preview PDF	STRAIN COMPENSATED REO BUFFER FOR III-N ON SILICON	Dargis; Rytis et al.	2016-05-12	7
74	US-9236249-B2	Preview PDF	III-N material grown on REN epitaxial buffer on Si substrate	Dargis; Rytis et al.	2016-01-12	9
75	US-9105471-B2	Preview PDF	Rare earth oxy-nitride buffered III-N on silicon	Clark; Andrew et al.	2015-08-11	7
76	US-20150014676-A1	Preview PDF	III-N MATERIAL GROWN ON REN EPITAXIAL BUFFER ON Si SUBSTRATE	Dargis; Rytis et al.	2015-01-15	10
77	US-20140357014-A1	Preview PDF	HIGH EFFICIENCY SOLAR CELL USING IIIB MATERIAL TRANSITION LAYERS	LEBBY; MICHAEL et al.	2014-12-04	10
78	US-8889978-B2	Preview PDF	III-V semiconductor interface with graded GeSn on silicon	Roucka; Radek et al.	2014-11-18	12
79	US-8878188-B2	Preview PDF	REO gate dielectric for III-N device on Si substrate	Dargis; Rytis et al.	2014-11-04	8
80	US-8872308-B2	Preview PDF	AlN cap grown on GaN/REO/silicon substrate structure	Arkun; Erdem et al.	2014-10-28	5
81	US-8835955-B2	Preview PDF	III-O.sub.xN.sub.y on single crystal SOI substrate and III n growth platform	Arkun; Erdem et al.	2014-09-16	10
82	US-8823055-B2	Preview PDF	REO/ALO/A1N template for III-N material growth on silicon	Arkun; Erdem et al.	2014-09-02	7
83	US-8823025-B1	Preview PDF	III-N material grown on AlO/AlN buffer on Si substrate	Arkun; Erdem et al.	2014-09-02	5
84	US-20140239307-A1	Preview PDF	REO GATE DIELECTRIC FOR III-N DEVICE ON Si SUBSTRATE	DARGIS; RYTIS et al.	2014-08-28	8
85	US-20140231817-A1	Preview PDF	III-N MATERIAL GROWN ON ALO/ALN BUFFER ON Si SUBSTRATE	Arkun; Erdem et al.	2014-08-21	5
86	US-20140231818-A1	Preview PDF	AlN CAP GROWN ON GaN/REO/SILICON SUBSTRATE STRUCTURE	Arkun; Erdem et al.	2014-08-21	5
87	US-20140225123-A1	Preview PDF	REO/ALO/A1N TEMPLATE FOR III-N MATERIAL GROWTH ON SILICON	Arkun; Erdem et al.	2014-08-14	10
88	US-8794010-B2	Preview PDF	Laser cooling of modified SOI wafer	Williams; David L. et al.	2014-08-05	12
89	US-20140167057-A1	Preview PDF	REO/ALO/A1N TEMPLATE FOR III-N MATERIAL GROWTH ON SILICON	Arkun; Erdem et al.	2014-06-19	7

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90	US-8748900-B1	Preview PDF	Re-silicide gate electrode for III-N device on Si substrate	Dargis; Rytis et al.	2014-06-10	10
91	US-8680507-B1	Preview PDF	AlN inter-layers in III-N material grown on DBR/silicon substrate	Arkun; Erdem et al.	2014-03-25	6
92	US-20140076390-A1	Preview PDF	III-V SEMICONDUCTOR INTERFACE WITH GRADED GeSn ON SILICON	Roucka; Radek et al.	2014-03-20	13
93	US-20140077240-A1	Preview PDF	IV MATERIAL PHOTONIC DEVICE ON DBR	Roucka; Radek et al.	2014-03-20	5
94	US-20140077338-A1	Preview PDF	Si-Ge-Sn ON REO TEMPLATE	Roucka; Radek et al.	2014-03-20	5
95	US-20140077339-A1	Preview PDF	DELTA DOPING AT Si-Ge INTERFACE	Roucka; Radek et al.	2014-03-20	5
96	US-20140053894-A1	Preview PDF	GRADED GeSn ON SILICON	Roucka; Radek et al.	2014-02-27	13
97	US-8637763-B2	Preview PDF	Solar cells with engineered spectral conversion	Lebby; Michael et al.	2014-01-28	18
98	US-8636844-B1	Preview PDF	Oxygen engineered single-crystal REO template	Dargis; Rytis et al.	2014-01-28	10
99	US-8633569-B1	Preview PDF	AlN inter-layers in III-N material grown on REO/silicon substrate	Arkun; Erdem et al.	2014-01-21	5
100	US-20140008644-A1	Preview PDF	OXYGEN ENGINEERED SINGLE-CRYSTAL REO TEMPLATE	Dargis; Rytis et al.	2014-01-09	10
101	US-8623747-B1	Preview PDF	Silicon, aluminum oxide, aluminum nitride template for optoelectronic and power devices	Arkun; Erdem et al.	2014-01-07	6
102	US-20130334536-A1	Preview PDF	SINGLE-CRYSTAL REO BUFFER ON AMORPHOUS SiO _x	Dargis; Rytis et al.	2013-12-19	7
103	US-8559097-B2	Preview PDF	Integrated pump laser and rare earth waveguide amplifier	Williams; David L. et al.	2013-10-15	10
104	US-8553741-B2	Preview PDF	Integrated rare earth devices	Lebby; Michael	2013-10-08	9
105	US-20130248853-A1	Preview PDF	NUCLEATION OF III-N ON REO TEMPLATES	Arkun; Erdem et al.	2013-09-26	8
106	US-8542437-B1	Preview PDF	Earth abundant photonic structures	Lebby; Michael S. et al.	2013-09-24	21
107	US-20130214282-A1	Preview PDF	III-N ON SILICON USING NANO STRUCTURED INTERFACE LAYER	Arkun; Erdem et al.	2013-08-22	7
108	US-8501635-B1	Preview PDF	Modification of REO by subsequent III-N EPI process	Clark; Andrew et al.	2013-08-06	10

Michael Lebby Curriculum Vitae (CV)

109	US-20130153918-A1	Preview	PDF REO-Si TEMPLATE WITH INTEGRATED REO LAYERS FOR LIGHT EMISSION	Clark; Andrew et al.	2013-06-20	9
110	US-8455756-B2	Preview	PDF High efficiency solar cell using IIIB material transition layers	Lebby; Michael et al.	2013-06-04	10
111	US-20130099357-A1	Preview	PDF STRAIN COMPENSATED REO BUFFER FOR III-N ON SILICON	Dargis; Rytis et al.	2013-04-25	7
112	US-20130071960-A1	Preview	PDF INTEGRATED RARE EARTH DEVICES	LEBBY; MICHAEL	2013-03-21	10
113	US-20130062609-A1	Preview	PDF III-N FET ON SILICON USING FIELD SUPPRESSING REO	Smith; Robin et al.	2013-03-14	10
114	US-20130062610-A1	Preview	PDF LATTICE MATCHED CRYSTALLINE REFLECTOR	Clark; Andrew et al.	2013-03-14	11
115	US-8394194-B1	Preview	PDF Single crystal reo buffer on amorphous SiO.sub.x	Dargis; Rytis et al.	2013-03-12	7
116	US-20130032858-A1	Preview	PDF RARE EARTH OXY-NITRIDE BUFFERED III-N ON SILICON	Clark; Andrew et al.	2013-02-07	8
117	US-8331410-B2	Preview	PDF Spontaneous/stimulated light emitting .mu.-cavity device	Lebby; Michael et al.	2012-12-11	8
118	US-8331413-B2	Preview	PDF Integrated rare earth devices	Lebby; Michael	2012-12-11	9
119	US-20120280276-A1	Preview	PDF Single Crystal Ge On Si	Dargis; Rytis et al.	2012-11-08	6
120	US-20120256232-A1	Preview	PDF Multilayer Rare Earth Device	Clark; Andrew et al.	2012-10-11	24
121	US-20120183767-A1	Preview	PDF HEXAGONAL REO TEMPLATE BUFFER FOR III-N LAYERS ON SILICON	Dargis; Rytis et al.	2012-07-19	10
122	US-20120145243-A1	Preview	PDF SOLAR CELLS WITH MAGNETICALLY ENHANCED UP-CONVERSION	Williams; David L. et al.	2012-06-14	13
123	US-20120147906-A1	Preview	PDF LASER COOLING OF MODIFIED SOI WAFER	Williams; David L. et al.	2012-06-14	12
124	US-20120104443-A1	Preview	PDF IIIOxNy ON SINGLE CRYSTAL SOI SUBSTRATE AND III n GROWTH PLATFORM	Clark; Andrew et al.	2012-05-03	9
125	US-20120104567-A1	Preview	PDF IIIOxNy ON REO/Si	Clark; Andrew et al.	2012-05-03	6
126	US-20120090672-A1	Preview	PDF REO-Ge Multi-Junction Solar Cell	LEBBY; MICHAEL S. et al.	2012-04-19	16
127	US-20120085399-A1	Preview	PDF REO-Ge Multi-Junction Solar Cell	Lebby; Michael S. et al.	2012-04-12	17

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128	US-20120073648-A1	Preview	PDF Photovoltaic conversion using rare earths plus Group IV Sensitizers	Clark; Andrew et al.	2012-03-29	18
129	US-20120019902-A1	Preview	PDF INTERGRATED PUMP LASER AND RARE EARTH WAVEGUIDE AMPLIFIER	Williams; David L. et al.	2012-01-26	10
130	US-20110290313-A1	Preview	PDF SOLAR CELLS WITH ENGINEERED SPECTRAL CONVERSION	LEBBY; MICHAEL et al.	2011-12-01	19
131	US-8049100-B2	Preview	PDF Multijunction rare earth solar cell	Clark; Andrew et al.	2011-11-01	24
132	US-8039738-B2	Preview	PDF Active rare earth tandem solar cell	Clark; Andrew et al.	2011-10-18	25
133	US-8039737-B2	Preview	PDF Passive rare earth tandem solar cell	Clark; Andrew et al.	2011-10-18	17
134	US-20110220173-A1	Preview	PDF ACTIVE SOLAR CONCENTRATOR WITH MULTI-JUNCTION DEVICES	LEBBY; MICHAEL	2011-09-15	15
135	US-20110203666-A1	Preview	PDF HIGH EFFICIENCY SOLAR CELL USING IIIB MATERIAL TRANSITION LAYERS	Lebby; Michael et al.	2011-08-25	10
136	US-20110188533-A1	Preview	PDF INTEGRATED RARE EARTH DEVICES	LEBBY; MICHAEL	2011-08-04	10
137	US-7968384-B2	Preview	PDF <i>Stacked transistors and process</i>	Atanakov; Petar B. et al.	2011-06-28	7
138	US-7967653-B2	Preview	PDF Full color display	Lebby; Michael et al.	2011-06-28	11
139	US-20110108908-A1	Preview	PDF <i>MULTILAYERED BOX IN FDSOI MOSFETS</i>	Lebby; Michael et al.	2011-05-12	34
140	US-7821066-B2	Preview	PDF <i>Multilayered BOX in FDSOI MOSFETS</i>	Lebby; Michael et al.	2010-10-26	33
141	US-20100122720-A1	Preview	PDF Passive Rare Earth Tandem Solar Cell	Clark; Andrew et al.	2010-05-20	17
142	US-20100116315-A1	Preview	PDF Active rare earth tandem solar cell	Clark; Andrew et al.	2010-05-13	25
143	US-20100112736-A1	Preview	PDF FULL COLOR DISPLAY	Lebby; Michael et al.	2010-05-06	12
144	US-20100109047-A1	Preview	PDF Multijunction rare earth solar cell	Clark; Andrew et al.	2010-05-06	23
145	US-20100084680-A1	Preview	PDF SPONTANEOUS/STIMULATED LIGHT EMITTING .mu.-CAVITY DEVICE	Lebby; Michael et al.	2010-04-08	8
146	US-7643526-B1	Preview	PDF Spontaneous/stimulated light emitting .mu.-cavity device	Lebby; Michael et al.	2010-01-05	8

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147	US-20090291535-A1	Preview	PDF STACKED TRANSISTORS AND PROCESS	Atanackovic; Petar B. et al.	2009-11-26	7
148	US-7605531-B1	Preview	PDF Full color display including LEDs with rare earth active areas and different radiative transistions	Lebby; Michael et al.	2009-10-20	11
149	US-7579623-B2	Preview	PDF Stacked transistors and process	Atanackovic; Petar B. et al.	2009-08-25	7
150	US-7538016-B2	Preview	PDF Signal and/or ground planes with double buried insulator layers and fabrication process	Atanakov; Petar B. et al.	2009-05-26	8
151	US-7388230-B1	Preview	PDF Selective colored light emitting diode	Lebby; Michael et al.	2008-06-17	9
152	US-20080135924-A1	Preview	PDF Multilayered box in FDSOI MOSFETS	Lebby; Michael et al.	2008-06-12	34
153	US-7365357-B2	Preview	PDF Strain inducing multi-layer cap	Atanackovic; Petar B. et al.	2008-04-29	6
154	US-20080093670-A1	Preview	PDF SIGNAL AND/OR GROUND PLANES WITH DOUBLE BURIED INSULATOR LAYERS AND FABRICATION PROCESS	Atanackovic; Petar B. et al.	2008-04-24	8
155	US-7355269-B1	Preview	PDF IC on non-semiconductor substrate	Lebby; Michael et al.	2008-04-08	4
156	US-7323396-B2	Preview	PDF Signal and/or ground planes with double buried insulator layers and fabrication process	Atanackovic; Petar B. et al.	2008-01-29	7
157	US-20070018166-A1	Preview	PDF Stacked transistors and process	Atanackovic; Petar B. et al.	2007-01-25	8
158	US-20070018203-A1	Preview	PDF Strain inducing multi-layer cap	Atanackovic; Petar B. et al.	2007-01-25	6
159	US-20060246691-A1	Preview	PDF Signal and/or ground planes with double buried insulator layers and fabrication process	Atanackovic; Petar B. et al.	2006-11-02	8
160	US-6999644-B1	Preview	PDF Discrete optoelectric package	Lebby; Michael S. et al.	2006-02-14	17
161	US-6966703-B1	Preview	PDF Self eject latch mechanism for an optical transceiver module	Lebby; Michael S. et al.	2005-11-22	9

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162	US-6795461-B1	Preview PDF <i>Optoelectric module</i>	Blair; Thomas H. et al.	2004-09-21	19
163	US-6663296-B1	Preview PDF <i>Optoelectric module</i>	Blair; Thomas H. et al.	2003-12-16	14
164	US-6412989-B1	Preview PDF <i>Directable laser transmission module</i>	Hartman; Davis Howard et al.	2002-07-02	8
165	US-6243056-B1	Preview PDF <i>Transceiver with miniature virtual image display</i>	Jachimowicz; Karen E. et al.	2001-06-05	12
166	US-6228440-B1	Preview PDF <i>Perishable media information storage mechanism and method of fabrication</i>	Dailey; Conan B. et al.	2001-05-08	7
167	US-6158884-A	Preview PDF <i>Integrated communicative watch</i>	Lebby; Michael S. et al.	2000-12-12	9
168	US-6161106-A	Preview PDF <i>Perishable media system and method of operation</i>	Dailey; Conan B. et al.	2000-12-12	7
169	US-6156582-A	Preview PDF <i>Method of fabricating top emitting ridge VCSEL with self-aligned contact and sidewall reflector</i>	Shieh; Chan-Long et al.	2000-12-05	6
170	US-6131017-A	Preview PDF <i>Dual system portable electronic communicator</i>	Lebby; Michael S. et al.	2000-10-10	8
171	US-6122023-A	Preview PDF <i>Non-speckle liquid crystal projection display</i>	Chen; Diana et al.	2000-09-19	8
172	US-6121068-A	Preview PDF <i>Long wavelength light emitting vertical cavity surface emitting laser and method of fabrication</i>	Ramdani; Jamal et al.	2000-09-19	7
173	US-6115618-A	Preview PDF <i>Portable electronic device with removable display</i>	Lebby; Michael S. et al.	2000-09-05	6
174	US-6111839-A	Preview PDF <i>Optical pickup head including a coherent first order mode laser light source</i>	Milster; Tom D. et al.	2000-08-29	7
175	US-6096666-A	Preview PDF <i>Holographic textile fiber</i>	Jachimowicz; Karen E. et al.	2000-08-01	6

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176	US-6097748-A	Preview	PDF <i>Vertical cavity surface emitting laser semiconductor chip with integrated drivers and photodetectors and method of fabrication</i>	Huang; Rong-Ting et al.	2000-08-01	11
177	US-6097528-A	Preview	PDF Microscanner for portable laser diode displays	Lebby; Michael S. et al.	2000-08-01	8
178	US-6091754-A	Preview	PDF VCSEL having integrated photodetector for automatic power control	Jiang; Wenbin et al.	2000-07-18	5
179	US-6084697-A	Preview	PDF Integrated electro-optical package	Lebby; Michael S. et al.	2000-07-04	9
180	US-6080690-A	Preview	PDF Textile fabric with integrated sensing device and clothing fabricated thereof	Lebby; Michael S. et al.	2000-06-27	8
181	US-6069593-A	Preview	PDF Display carrier and electronic display control for multiple displays in a portable electronic device	Lebby; Michael S. et al.	2000-05-30	6
182	US-6064780-A	Preview	PDF Interconnect substrate with a single contact accessible in an upper and an end surface	Blair; Thomas H. et al.	2000-05-16	6
183	US-6061380-A	Preview	PDF Vertical cavity surface emitting laser with doped active region and method of fabrication	Jiang; Wenbin et al.	2000-05-09	8
184	US-6061485-A	Preview	PDF Method for wavelength division multiplexing utilizing donut mode vertical cavity surface emitting lasers	Jiang; Wenbin et al.	2000-05-09	7
185	US-6029073-A	Preview	PDF Display carrier with binocular viewing for a portable electronic device	Lebby; Michael S. et al.	2000-02-22	7
186	US-6026111-A	Preview	PDF Vertical cavity surface emitting laser device having an extended cavity	Jiang; Wenbin et al.	2000-02-15	6
187	US-6022760-A	Preview	PDF Integrated electro-optical package and method of fabrication	Lebby; Michael S. et al.	2000-02-08	12
188	US-6021146-A	Preview	PDF Vertical cavity surface emitting laser for high power single mode operation and method of fabrication	Jiang; Wenbin et al.	2000-02-01	7
189	US-6021147-A	Preview	PDF Vertical cavity surface emitting laser for high power single mode operation and method of fabrication	Jiang; Wenbin et al.	2000-02-01	7

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190	US-6008067-A	Preview PDF <i>Fabrication of visible wavelength vertical cavity surface emitting laser</i>	Ramdani; Jamal et al.	1999-12-28	5
191	US-5978398-A	Preview PDF <i>Long wavelength vertical cavity surface emitting laser</i>	Ramdani; Jamal et al.	1999-11-02	5
192	US-5974071-A	Preview PDF <i>VCSEL with integrated photodetectors for automatic power control and signal detection in data storage</i>	Jiang; Wenbin et al.	1999-10-26	8
193	US-5966399-A	Preview PDF <i>Vertical cavity surface emitting laser with integrated diffractive lens and method of fabrication</i>	Jiang; Wenbin et al.	1999-10-12	7
194	US-5959315-A	Preview PDF <i>Semiconductor to optical link</i>	Lebby; Michael S. et al.	1999-09-28	6
195	US-5956363-A	Preview PDF <i>Long wavelength vertical cavity surface emitting laser with oxidation layers and method of fabrication</i>	Lebby; Michael S. et al.	1999-09-21	7
196	US-5956364-A	Preview PDF <i>Vertical cavity surface emitting laser with shaped cavity mirror and method of fabrication</i>	Jiang; Wenbin et al.	1999-09-21	6
197	US-5953355-A	Preview PDF <i>Semiconductor laser package with power monitoring system</i>	Kiely; Philip et al.	1999-09-14	6
198	US-5946121-A	Preview PDF <i>IrDA data link with VCSEL light source</i>	Jiang; Wenbin et al.	1999-08-31	4
199	US-5943359-A	Preview PDF <i>Long wavelength VCSEL</i>	Ramdani; Jamal et al.	1999-08-24	5
200	US-5943357-A	Preview PDF <i>Long wavelength vertical cavity surface emitting laser with photodetector for automatic power control and method of fabrication</i>	Lebby; Michael S. et al.	1999-08-24	7
201	US-5939773-A	Preview PDF <i>Semiconductor laser package including a lead frame and plastic resin housing</i>	Jiang; Wenbin et al.	1999-08-17	8
202	US-5936929-A	Preview PDF <i>Optical submodule and method for making</i>	Jiang; Wenbin et al.	1999-08-10	7
203	US-5923696-A	Preview PDF <i>Visible light emitting vertical cavity surface emitting laser with gallium phosphide contact layer and method of fabrication</i>	Ramdani; Jamal et al.	1999-07-13	7
204	US-5914973-A	Preview PDF <i>Vertical cavity surface emitting laser for high power operation and method of fabrication</i>	Jiang; Wenbin et al.	1999-06-22	7

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205	US-5906004-A	Preview PDF Textile fabric with integrated electrically conductive fibers and clothing fabricated thereof	Lebby; Michael S. et al.	1999-05- 7 25
206	US-5905750-A	Preview PDF <i>Semiconductor laser package and method of fabrication</i>	Lebby; Michael S. et al.	1999-05- 10 18
207	US-5903586-A	Preview PDF <i>Long wavelength vertical cavity surface emitting laser</i>	Ramdani; Jamal et al.	1999-05- 5 11
208	US-5898722-A	Preview PDF <i>Dual wavelength monolithically integrated vertical cavity surface emitting lasers and method of fabrication</i>	Ramdani; Jamal et al.	1999-04- 8 27
209	US-5886972-A	Preview PDF Recording information in a phase change optical medium with a vertical cavity surface emitting laser	Jiang; Wenbin et al.	1999-03- 5 23
210	US-5883912-A	Preview PDF <i>Long wavelength VCSEL</i>	Ramdani; Jamal et al.	1999-03- 5 16
211	US-5881084-A	Preview PDF <i>Semiconductor laser for package with power monitoring system</i>	Huang; Rong-Ting et al.	1999-03- 8 09
212	US-5848086-A	Preview PDF <i>Electrically confined VCSEL</i>	Lebby; Michael S. et al.	1998-12- 7 08
213	US-5838703-A	Preview PDF <i>Semiconductor laser package with power monitoring system and optical element</i>	Lebby; Michael S. et al.	1998-11- 9 17
214	US-5838707-A	Preview PDF Ultraviolet/visible light emitting vertical cavity surface emitting laser and method of fabrication	Ramdani; Jamal et al.	1998-11- 8 17
215	US-5835521-A	Preview PDF <i>Long wavelength light emitting vertical cavity surface emitting laser and method of fabrication</i>	Ramdani; Jamal et al.	1998-11- 7 10
216	US-5831960-A	Preview PDF <i>Integrated vertical cavity surface emitting laser pair for high density data storage and method of fabrication</i>	Jiang; Wenbin et al.	1998-11- 7 03
217	US-5821571-A	Preview PDF <i>Dual sided integrated electro-optical package</i>	Lebby; Michael S. et al.	1998-10- 13 13
218	US-5818404-A	Preview PDF <i>Integrated electro-optical package</i>	Lebby; Michael S. et al.	1998-10- 18 06
219	US-5815524-A	Preview PDF <i>VCSEL including GaTIP active region</i>	Ramdani; Jamal et al.	1998-09- 5 29
220	US-5796769-A	Preview PDF Red light vertical cavity surface emitting laser	Ramdani; Jamal et al.	1998-08- 6 18
221	US-5789733-A	Preview PDF Smart card with contactless optical interface	Jachimowicz; Karen E. et al.	1998-08- 7 04
222	US-5774486-A	Preview PDF <i>Waveguide power monitoring system for vertical cavity surface emitting lasers</i>	Jiang; Wenbin et al.	1998-06- 6 30
223	US-5764671-A	Preview PDF <i>VCSEL with selective oxide transition regions</i>	Lebby; Michael S. et al.	1998-06- 10 09

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224 US-5757741-A	Preview PDF CD ROM head with VCSEL or VCSEL array	Jiang; Wenbin et al.	1998-05- 11 26
225 US-5757829-A	Preview PDF Flip chip power monitoring system for vertical cavity surface emitting lasers	Jiang; Wenbin et al.	1998-05- 6 26
226 US-5757836-A	Preview PDF Vertical cavity surface emitting laser with laterally integrated photodetector	Jiang; Wenbin et al.	1998-05- 8 26
227 US-5751757-A	Preview PDF VCSEL with integrated MSM photodetector	Jiang; Wenbin et al.	1998-05- 5 12
228 US-5751471-A	Preview PDF Switchable lens and method of making	Chen; Diana et al.	1998-05- 8 12
229 US-5748665-A	Preview PDF Visible VCSEL with hybrid mirrors	Jiang; Wenbin et al.	1998-05- 7 05
230 US-5748161-A	Preview PDF Integrated electro-optical package with independent menu bar	Lebby; Michael S. et al.	1998-05- 22 05
231 US-5742630-A	Preview PDF VCSEL with integrated pin diode	Jiang; Wenbin et al.	1998-04- 6 21
232 US-5741724-A	Preview PDF Method of growing gallium nitride on a spinel substrate	Ramdani; Jamal et al.	1998-04- 5 21
233 US-5739800-A	Preview PDF Integrated electro-optical package with LED display chip and substrate with drivers and central opening	Lebby; Michael S. et al.	1998-04- 19 14
234 US-5732103-A	Preview PDF Long wavelength VCSEL	Ramdani; Jamal et al.	1998-03- 5 24
235 US-5719892-A	Preview PDF Hybrid mirror structure for a visible emitting VCSEL	Jiang; Wenbin et al.	1998-02- 8 17
236 US-5719893-A	Preview PDF Passivated vertical cavity surface emitting laser	Jiang; Wenbin et al.	1998-02- 7 17
237 US-5710441-A	Preview PDF Microcavity LED with photon recycling	Ackley; Donald E. et al.	1998-01- 5 20
238 US-5708280-A	Preview PDF Integrated electro-optical package and method of fabrication	Lebby; Michael S. et al.	1998-01- 12 13
239 US-5706306-A	Preview PDF VCSEL with distributed Bragg reflectors for visible light	Jiang; Wenbin et al.	1998-01- 6 06
240 US-5703664-A	Preview PDF Integrated electro-optic package for reflective spatial light modulators	Jachimowicz; Karen E. et al.	1997-12- 13 30
241 US-5699073-A	Preview PDF Integrated electro-optical package with carrier ring and method of fabrication	Lebby; Michael S. et al.	1997-12- 19 16
242 US-5661075-A	Preview PDF Method of making a VCSEL with passivation	Grodzinski; Piotr et al.	1997-08- 9 26

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243	US-5654228-A	Preview PDF VCSEL having a self-aligned heat sink and method of making	Shieh; Chan-Long et al.	1997-08-05	7
244	US-5644369-A	Preview PDF Switchable lens/diffuser	Jachimowicz; Karen E. et al.	1997-07-01	8
245	US-5638392-A	Preview PDF Short wavelength VCSEL	Ramdani; Jamal et al.	1997-06-10	6
246	US-5636298-A	Preview PDF Coalescing optical module and method for making	Jiang; Wenbin et al.	1997-06-03	8
247	US-5633886-A	Preview PDF Short wavelength VCSEL with Al-free active region	Ramdani; Jamal et al.	1997-05-27	6
248	US-5625734-A	Preview PDF Optoelectronic interconnect device and method of making	Thomas; Ronald E. et al.	1997-04-29	7
249	US-5574744-A	Preview PDF Optical coupler	Gaw; Craig A. et al.	1996-11-12	7
250	US-5563900-A	Preview PDF Broad spectrum surface-emitting led	Ackley; Donald E. et al.	1996-10-08	7
251	US-5557626-A	Preview PDF Patterned mirror VCSEL with adjustable selective etch region	Grodzinski; Piotr et al.	1996-09-17	8
252	US-5555341-A	Preview PDF Waveguide with an electrically conductive channel	Sharma; Ravinder K. et al.	1996-09-10	7
253	US-5550941-A	Preview PDF Optoelectronic interface module	Lebby; Michael S. et al.	1996-08-27	8
254	US-5545359-A	Preview PDF Method of making a plastic molded optoelectronic interface	Ackley; Donald E. et al.	1996-08-13	9
255	US-5546413-A	Preview PDF Integrated light emitting device	Lebby; Michael S. et al.	1996-08-13	10
256	US-5543958-A	Preview PDF Integrated electro-optic package for reflective spatial light modulators	Lebby; Michael S. et al.	1996-08-06	14
257	US-5540799-A	Preview PDF Method of fabricating optical waveguide from a laminate	Lebby; Michael S. et al.	1996-07-30	6
258	US-5538919-A	Preview PDF Method of fabricating a semiconductor device with high heat conductivity	Lebby; Michael S. et al.	1996-07-23	8
259	US-5539200-A	Preview PDF Integrated optoelectronic substrate	Lebby; Michael S. et al.	1996-07-23	6
260	US-5539554-A	Preview PDF Integrated electro-optic package for reflective spatial light	Lebby; Michael S. et al.	1996-07-23	14
261	US-5534888-A	Preview PDF Electronic book	Lebby; Michael S. et al.	1996-07-09	8

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262	US-5530715-A	Preview	PDF <i>Vertical cavity surface emitting laser having continuous grading</i>	Shieh; Chan-Long et al.	1996-06-25	7
263	US-5521992-A	Preview	PDF <i>Molded optical interconnect</i>	Chun; Christopher K. Y. et al.	1996-05-28	10
264	US-5517348-A	Preview	PDF <i>Voltage controlled transparent layer for a bi-directional device</i>	Lebby; Michael S.	1996-05-14	5
265	US-5511138-A	Preview	PDF <i>Interlocking waveguide and method of making</i>	Lebby; Michael S. et al.	1996-04-23	8
266	US-5498883-A	Preview	PDF <i>Superluminescent edge emitting device with apparent vertical light emission and method of making</i>	Lebby; Michael S. et al.	1996-03-12	7
267	US-5493437-A	Preview	PDF <i>External communication link for a credit card pager</i>	Lebby; Michael S. et al.	1996-02-20	10
268	US-5491491-A	Preview	PDF <i>Portable electronic equipment with binocular virtual display</i>	Lebby; Michael S. et al.	1996-02-13	11
269	US-5486946-A	Preview	PDF <i>Integrated electro-optic package for reflective spatial light modulators</i>	Jachimowicz; Karen E. et al.	1996-01-23	14
270	US-5485318-A	Preview	PDF <i>Dual image manifestation apparatus with integrated electro-optical package</i>	Lebby; Michael S. et al.	1996-01-16	17
271	US-5482658-A	Preview	PDF <i>Method of making an optoelectronic interface module</i>	Lebby; Michael S. et al.	1996-01-09	8
272	US-5482891-A	Preview	PDF <i>VCSEL with an integrated heat sink and method of making</i>	Shieh; Chan-Long et al.	1996-01-09	6
273	US-5478774-A	Preview	PDF <i>Method of fabricating patterned-mirror VCSELs using selective growth</i>	Ackley; Donald E. et al.	1995-12-26	7
274	US-5473716-A	Preview	PDF <i>Fiber bundle interconnect and method of making same</i>	Lebby; Michael S. et al.	1995-12-05	8
275	US-5468656-A	Preview	PDF <i>Method of making a VCSEL</i>	Shieh; Chan-Long et al.	1995-11-21	9
276	US-5469185-A	Preview	PDF <i>Remote sensory unit and driver</i>	Lebby; Michael S. et al.	1995-11-21	7
277	US-5468582-A	Preview	PDF <i>Fused optical layer and method of making</i>	Blair; Thomas H. et al.	1995-11-21	7
278	US-5466633-A	Preview	PDF <i>Optical reading head and method for making same</i>	Ackley; Donald E. et al.	1995-11-14	11
279	US-5467215-A	Preview	PDF <i>Integrated electro-optic package for reflective spatial light modulators</i>	Lebby; Michael S. et al.	1995-11-14	13
280	US-5452387-A	Preview	PDF <i>Coaxial optoelectronic mount and method of making same</i>	Chun; Christopher K. Y. et al.	1995-09-19	5

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281	US-5446752-A	Preview	PDF VCSEL with current blocking layer offset	Ackley; Donald E. et al.	1995-08-29	10
282	US-5437092-A	Preview	PDF Method of making contact areas on an optical waveguide	Hartman; Davis H. et al.	1995-08-01	7
283	US-5432809-A	Preview	PDF VCSEL with Al-free cavity region	Grodzinski; Piotr et al.	1995-07-11	7
284	US-5432630-A	Preview	PDF Optical bus with optical transceiver modules and method of manufacture	Lebby; Michael S. et al.	1995-07-11	16
285	US-5428704-A	Preview	PDF Optoelectronic interface and method of making	Lebby; Michael S. et al.	1995-06-27	16
286	US-5422901-A	Preview	PDF Semiconductor device with high heat conductivity	Lebby; Michael S. et al.	1995-06-06	7
287	US-5416870-A	Preview	PDF Optoelectronic interface device and method with reflective surface	Chun; Christopher K. Y. et al.	1995-05-16	8
288	US-5408547-A	Preview	PDF Optical read/write head	Lebby; Michael S. et al.	1995-04-18	10
289	US-5400423-A	Preview	PDF Molded star coupler and method of making same	Chun; Christopher K. Y. et al.	1995-03-21	5
290	US-5400352-A	Preview	PDF Semiconductor laser and method therefor	Lebby; Michael S. et al.	1995-03-21	5
291	US-5389312-A	Preview	PDF Method of fabricating molded optical waveguides	Lebby; Michael S. et al.	1995-02-14	8
292	US-5390275-A	Preview	PDF Molded waveguide and method for making same	Lebby; Michael S. et al.	1995-02-14	9
293	US-5388120-A	Preview	PDF VCSEL with unstable resonator	Ackley; Donald E. et al.	1995-02-07	5
294	US-5369529-A	Preview	PDF Reflective optoelectronic interface device and method of making	Kuo; Shun-Meen et al.	1994-11-29	7
295	US-5369415-A	Preview	PDF Direct retinal scan display with planar imager	Richard; Fred V. et al.	1994-11-29	6
296	US-5367593-A	Preview	PDF Optical/electrical connector and method of fabrication	Lebby; Michael S. et al.	1994-11-22	10
297	US-5361317-A	Preview	PDF Assembly with fixture aligning and affixing an optical fiber to an optical device	Hartman; Davis H. et al.	1994-11-01	7
298	US-5359686-A	Preview	PDF Interface for coupling optical fibers to electronic circuitry	Galloway; David et al.	1994-10-25	17
299	US-5358880-A	Preview	PDF Method of manufacturing closed cavity LED	Lebby; Michael S. et al.	1994-10-25	6

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300	US-5359618-A	Preview PDF	High efficiency VCSEL and method of fabrication	Lebby; Michael S. et al.	1994-10-25	6
301	US-5359669-A	Preview PDF	Remote retinal scan identifier	Shanley; Charles W. et al.	1994-10-25	7
302	US-5351257-A	Preview PDF	VCSEL with vertical offset operating region providing a lateral waveguide and current limiting and method of fabrication	Lebby; Michael S. et al.	1994-09-27	10
303	US-5351331-A	Preview PDF	Method and apparatus for splicing optical fibers with signal I/O	Chun; Christopher K. Y. et al.	1994-09-27	11
304	US-5349210-A	Preview PDF	Optical reading head with angled array	Ackley; Donald E. et al.	1994-09-20	10
305	US-5348616-A	Preview PDF	Method for patterning a mold	Hartman; Davis H. et al.	1994-09-20	12
306	US-5345524-A	Preview PDF	Optoelectronic transceiver sub-module and method for making	Lebby; Michael S. et al.	1994-09-06	9
307	US-5345527-A	Preview PDF	Intelligent opto-bus with display	Lebby; Michael S. et al.	1994-09-06	11
308	US-5345530-A	Preview PDF	Molded waveguide and method for making same	Lebby; Michael S. et al.	1994-09-06	8
309	US-5337391-A	Preview PDF	Optoelectronic sub-module and method of making same	Lebby; Michael S.	1994-08-09	10
310	US-5337397-A	Preview PDF	Optical coupling device and method for making	Lebby; Michael S. et al.	1994-08-09	7
311	US-5335300-A	Preview PDF	Method of manufacturing I/O node in an optical channel waveguide and apparatus for utilizing	Hartman; Davis H. et al.	1994-08-02	10
312	US-5325451-A	Preview PDF	Modular optical waveguide and method for making	Hartman; Davis et al.	1994-06-28	5
313	US-5324964-A	Preview PDF	Superluminescent surface light emitting device	Ackley; Donald E. et al.	1994-06-28	5
314	US-5323477-A	Preview PDF	Contact array imager with integral waveguide and electronics	Lebby; Michael S. et al.	1994-06-21	10
315	US-5313545-A	Preview PDF	Molded waveguide with a unitary cladding region and method of making	Kuo; Shun-Meen et al.	1994-05-17	11
316	US-5309537-A	Preview PDF	Optoelectronic coupling device and method of making	Chun; Christopher K. Y. et al.	1994-05-03	11
317	US-5286982-A	Preview PDF	High contrast ratio optical modulator	Ackley; Donald E. et al.	1994-02-15	7
318	US-5282071-A	Preview PDF	Contact areas on an optical waveguide and method of making	Hartman; Davis H. et al.	1994-01-25	8
319	US-5276762-A	Preview PDF	Magnetic holding methods for optical fiber I/O assembly	Hartman; Davis H. et al.	1994-01-04	4
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322 US-5265184-A	Preview PDF	<i>Molded waveguide and method for making same</i>	Lebby; Michael S. et al.	1993-11-23	8
323 US-5249245-A	Preview PDF	<i>Optoelectronic mount including flexible substrate and method for making same</i>	Lebby; Michael S. et al.	1993-09-28	10
324 US-5230030-A	Preview PDF	<i>Interface coupling electronic circuitry</i>	Hartman; Davis H. et al.	1993-07-20	6
325 US-5228101-A	Preview PDF	<i>Electrical to optical links using metalization</i>	Lebby; Michael S. et al.	1993-07-13	6
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327 US-5218465-A	Preview PDF	<i>Intelligent interconnects for broadband optical networking</i>	Lebby; Michael S. et al.	1993-06-08	6
328 US-5172384-A	Preview PDF	<i>Low threshold current laser</i>	Goronkin; Herbert et al.	1992-12-15	14
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 - b. "Electron Device Letters, IEEE Volume: 9, Issue: 6 Digital Object Identifier: 10.1109/55.716 Publication Year: 1988 , Page(s): 278 - 280"
 - c. <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=716&tag=1>
- 8) Paper: An inversion channel technology for opto-electronic integration
 - a. Sep 1988
 - b. "Optical Communication, 1988. (ECOC 88). Fourteenth European Conference on (Conf. Publ. No.292), Publication Year: 1988, Page(s): 211 - 214 vol.1"
- 9) <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=93560> Paper: Performance and advantages of BICFETs versus HBTs
 - a. Sep 1988
 - b. "Bipolar Circuits and Technology Meeting, 1988., Proceedings of the 1988 Digital Object Identifier: 10.1109/BIPOL.1988.51041 Publication Year: 1988 , Page(s): 41- 45"
 - c. <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=51041>
- 10) Talk and abstract: RIE and MIE comparison for optoelectronic integrated circuit processing
 - a. Nov 1988
 - b. IEEE LEOS Conference, Santa Clara, California
- 11) Paper: Reactive ion etching (RIE) and magnetron ion etching (MIE) combinations for opto-electronic integrated circuit (OEIC) processing
 - a. Nov 1988
 - b. Proc. SPIE Vol. 1037, p. 88, Monitoring and Control of Plasma-Enhanced Processing of Semiconductors, James E. Griffiths; Ed.
 - c. http://spie.org/x648.html?product_id=951018

1989

- 1) Paper: An n-channel BICFET in the InGaAs/InAlGaAs/InAlAs material system
 - a. 1989
 - b. "Electron Device Letters, IEEE Volume: 10 , Issue: 7 Digital Object Identifier: 10.1109/55.29660 Publication Year: 1989 , Page(s): 304 - 306"
 - c. <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=29660&tag=1>
- 2) Paper: An n-channel BICFET in the GaAs/AlGaAs material system
 - a. Feb 1989

- b. "Electron Device Letters, IEEE Volume: 10, Issue: 2 Digital Object Identifier: 10.1109/55.32438 Publication Year: 1989 , Page(s): 88 - 90"
- c. <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=32438&tag=1>
- 3) Paper: An Inversion Channel Technology For Opto-Electronic Integration
 - a. 8th Feb 1989
 - b. A new approach to optoelectronic integration is reported which combines electronic and optical devices fabricated with a common sequence and a single MBE wafer growth. The devices have in common, an inversion layer structure produced by charge sheet doping.
 - c. Proceedings Vol. 0994 Optoelectronic Materials, Devices, Packaging, and Interconnects II, Glen M. McWright; Henry J. Wojtunik, Editors, pp.251-510 Date: 9 February 1989 ISBN: 9780819400291
 - d. http://spie.org/x648.html?product_id=960136

1991

- 4) Invited talk and abstract: Use of VCSELs for the MONSOON parallel digital computer
 - a. Jan 1991
 - b. International workshop on architectures for free-space digital computing, Colorado.
- 5) Invited Paper and Presentation: Approaching the problem of high-density interconnects in the 'Monsoon' data-flow parallel processor with optics"
 - a. 28th Jan1991
 - b. AFOSR, ONR, DARPA: A compendium of position papers from the workshop on architectures for free space digital optical computing
 - c. http://www.researchgate.net/publication/235184814_A_Compendium_of_Position_Papers_from_the_Workshop_on_Architectures_for_Free_Space_Digital_Optical_Computing_Held_in_Vail_Colorado_on_28-30_January_1991

1993

- 6) Invited talk and abstract: Optoelectronic Devices and Applications
 - a. 1993
 - b. IEEE workshop on optical interconnects
- 7) Invited talk and abstract: VCSEL Technology and Progress

- a. 1993
- b. IEEE Waves and Devices, Phoenix Section, Tempe, Arizona, Arizona State University

1994

- 8) Invited talk and abstract: Ridge waveguide VCSELs: improvement over planar VCSELs
 - a. May 1994
 - b. USA Laser workshop, CLEO, Baltimore, MD
- 9) Invited talk and abstract: Packaging VCSELs with GUIDECAST(tm) an overmolded waveguide packaging platform
 - a. Aug 1994
 - b. IEEE Tropical workshop on optoelectronic packaging, Breckenridge, Colorado.

1995

- 10) Paper: Parallel optical interconnects using VCSELs
 - a. 1995
 - b. "High Speed Semiconductor Devices and Circuits, 1995. Proceedings., IEEE/Cornell Conference on Advanced Concepts in Digital Object Identifier: 10.1109/CORNEL.1995.482526 Publication Year: 1995 , Page(s): 348 - 356"
 - c. <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=482526>
- 11) Book: Research in VCSEL devices - Annual technical review 1995
 - a. 1995
 - b. Annual collection of optoelectronic device and reliability department papers at the photonics technology center, Motorola, Tempe, USA.
 - c. Key focus was the commercialization of VCSEL technology, especially at 850nm for the Optobus™ parallel array product and other associated VCSEL prototypes.
 - d. Motorola
- 12) Invited talk and abstract: Ridge waveguide VCSEL device performance
 - a. May 1995
 - b. USA Laser workshop, CLEO, Anaheim, California
- 13) Invited talk and abstract: VCSEL Arrays and GUIDECAST(tm) packaging technology as used in OPTOBUS(tm)
 - a. Sep 1995

- b. European Laser Workshop, Eindhoven, Netherlands

1996

- 14) Book: Research in optoelectronic devices volume II
 - a. 1996
 - b. Annual collection of optoelectronic device and reliability department papers at the photonics technology center, Motorola, Tempe, USA. Key focus was the commercialization of VCSEL technology, especially at 850nm for the optobus parallel array product and other associated VCSEL prototypes. Demonstration of 660nm VCSELs discussed.
 - c. Motorola
- 15) Paper: Low-cost high-performance optical interconnect
 - a. 1996
 - b. Proceedings, Conference on Lasers and Electro-Optics, (CLEO), vol 9, 1996
 - c. <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=864750>
- 16) Paper: Key challenges and results of VCSELs in data links
 - a. 1996
 - b. "Lasers and Electro-Optics Society Annual Meeting, 1996. LEOS 96., IEEE Volume: 2 Digital Object Identifier: 10.1109/LEOS.1996.571604 Publication Year: 1996 , Page(s): 167 - 168 vol.2"
 - c. <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=571604>
- 17) Paper: A low-cost high-performance optical interconnect
 - a. 1996
 - b. "Components, Packaging, and Manufacturing Technology, Part B: Advanced Packaging, IEEE Transactions on Volume: 19 , Issue: 3 Digital Object Identifier: 10.1109/96.533892 Publication Year: 1996 , Page(s): 532- 539"
 - c. <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=533892>
- 18) Paper: Characteristics of VCSEL arrays for parallel optical interconnects
 - a. 1996
 - b. "Electronic Components and Technology Conference, 1996. Proceedings., 46th Digital Object Identifier: 10.1109/ECTC.1996.517404 Publication Year: 1996 , Page(s): 279 - 291"
 - c. <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=517404>
- 19) Paper: Use of VCSEL arrays for parallel optical interconnects
 - a. 10th Apr 1996
 - b. Proc. SPIE 2683, Fabrication, Testing, and Reliability of Semiconductor Lasers, 81 (April 10, 1996); doi:10.1117/12.237679
 - c. <http://proceedings.spiedigitallibrary.org/proceeding.aspx?articleid=1015866>

- 20) Paper: A low-cost high-performance optical interconnect
- Aug 1996
 - The Optobus™ link is a ten channel parallel bidirectional data link based on multimode fiber ribbons. The guiding principal of the Optobus™ design was to produce an optical interconnect capable of competing with copper on price, not just performance. Recognizing that packaging dominates the cost of optical interconnects, the design focused on minimizing the complexity of the optical subassembly. A key component of this strategy is the use of AlGaAs/GaAs vertical cavity surface emitting lasers (VCSELs). Another is designing the silicon receiver and transmitter arrays around the module level packaging parasitics. The resulting parallel transceiver modules achieve a minimum throughput of 1.5 Gb/s in each direction with a power dissipation of 1.6 W
 - Components, Packaging, and Manufacturing Technology, Part B: Advanced Packaging, IEEE Transactions on Volume: 19 , Issue: 3 Page(s): 532- 539
 - <http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=533892>
- 21) Invited talk and abstract: Ridge Waveguide and Planar VCSEL Device Reliability
- Sep 1996
 - European Laser Workshop, Oslo, Norway
- 22) Invited talk and abstract: Vertical cavity surface emitting lasers for communication applications
- Oct 1996
 - Optical Society of America (OSA) Annual meetings, proceedings, paper WR1, Rochester, NY
- 23) Paper: Characteristics of VCSELs and VCSEL arrays for Optical Data Links
- 10th Dec 1996
 - Motorola: Technical Enrichment Matrix Conference, Motorola SPS- SABA, Hilton Pavilion, Mesa, Az

1997

- 24) Paper: Effect of proton implantation on the degradation of GaAs/AlGaAs vertical cavity surface emitting lasers
- 1997
 - Electronics Letters, ISSN 0013-5194, 1997, Volume 33, Issue 2, p. 137
 - <http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=579434>
- 25) Paper (invited): Laser safety issues with VCSEL arrays in OPTOBUS(tm)
- 1997
 - Optical Society of America (OSA); Annual Meeting, Micro-optics session

- 26) Paper: Relative intensity noise of 780nm vertical cavity surface emitting lasers Jan 1997
- Proceedings of the 1997 Pacific Rim Conference on Lasers and Electro-Optics, CLEO/Pacific Rim, No 46984, Jan 1997
 - <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=610586>
- 27) Paper: Characteristics of VCSELs and VCSEL arrays for optical data links
- Feb 1997
 - Proc. SPIE 3004, Fabrication, Testing, and Reliability of Semiconductor Lasers II, 122 (May 1, 1997); doi:10.1117/12.273825
 - <http://proceedings.spiedigitallibrary.org/proceeding.aspx?articleid=918720>
- 28) Paper: Parallel interconnect for a novel system approach to short distance high information transfer data links
- April 1997
 - Proceedings of SPIE, ISSN 0277-786X, 04/1997, Volume 3038, Issue 1
 - <http://www.deepdyve.com/lp/spie/parallel-interconnect-for-a-novel-system-approach-to-short-distance-RFreDaEJjb>
- 29) Paper: Vertical cavity surface emitting laser packaging with auto power control
- May 1997
 - Proceedings, 47th Electronic Components and Technology Conference, pp. 368-370, May 1997
 - http://www.researchgate.net/publication/3700010_Vertical_cavity_surface_emitting_laser_packaging_with_auto_powercontrol
- 30) Course (peer reviewed): "Optoelectronic devices and packaging"
- May 1997
 - IEEE ECTC
 - <http://www.ectc.net>
- 31) Paper: Vertical cavity surface emitting laser packaging with auto power control
- 18th May 1997
 - Electronic Components and Technology Conference, 1997. Proceedings., 47th
 - [http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=606195&contentType=Conference+Publications&sortType%3Dasc_p_Sequence%26filter%3DAND\(p_IS_Number%3A13278\)](http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=606195&contentType=Conference+Publications&sortType%3Dasc_p_Sequence%26filter%3DAND(p_IS_Number%3A13278))
- 32) Invited Talk and Abstract: VCSEL/detector technology for parallel optical interconnects
- 17th Jun 1997
 - International Workshop for new technologies, interconnects, and communications in distributed and parallel systems by IRIT, ONERA, CERT, CNRS, and LAAS (France)
- 33) Invited talk and abstract: Vertical cavity surface emitting lasers and applications
- Sep 1997
 - European Laser Workshop, Glasgow, Scotland

1998

- 34) Course and Tutorial: Optoelectronic Devices and Packaging: VCSEL Technology
- Jan 1998
 - "Optoelectronic devices and packaging have found increasing use in many new products over the last 20 Yrs. This tutorial primarily will focus on semiconductor laser based technology with particular emphasis on emerging new technologies such as the Vertical Cavity Surface Emitting Laser (VCSEL) and how to take advantage of its uniqueness in packaging. The tutorial will look at the driving factors required for low cost high volume VCSEL based packages and what impact they will have in tomorrow's products. As there are many packaging solutions for VCSEL based technology proposed, the course will show the relative merits of popular new technologies with respect to high volume and low cost manufacturing.
 - 4th IEEE Workshop on AST Phoenix Research Center
 - <http://www.ewh.ieee.org/soc/cpmt/ast98/lebbby-01.ppt>
- 35) Paper: ORMOCERs - new photo-patternable dielectric and optical materials for MCM-packaging
- Jan 1998
 - Hybrid inorganic-organic polymers (ORMOCERs*) have been developed and tested in an ongoing EU-program (BE 7250 DONDOMCM) for evaluation in MCM applications. The photopatternable materials with negative resist behavior are composed of inorganic oxidic structures cross-linked or substituted by organic groups. They are prepared from organosilane precursors by sol-gel-processing in combination with organic crosslinking of polymerizable organic functions. As a result of these functionalities the properties of the ORMOCERs can be adjusted to particular applications. Systematic variation of composition combined with adaptation to micro system technology allows great flexibility in processing. Some features of these materials are: Postbaking at moderate temperatures (120 °C - 180 °C) enables processing on substrates such as FR-4 and BT. Combined use as dielectric and passivation layers in electrical systems and devices as well as core and cladding for optical applications enables e/o applications with high integration levels. Easily adaptable to thin film technology: spin-on with planarization >90% and via diameters down to 20 µm have been achieved
 - Proceedings of the 1998 48th Electronic Components and Technology Conference
 - <http://ieeexplore.ieee.org/xpl/articleDetails.jsp?reload=true&arnumber=678838&contentType=Conference+Publications>
- 36) Paper and Invited talk: VCSEL Devices and Packaging for Fiber Optic Transceivers
- 30th Mar 1998
 - OSA Technical Digest: Integrated Photonics Research (IPR) 1998 paper: IWD1

- c. <http://www.opticsinfobase.org/abstract.cfm?URI=IPR-1998-IWD1>
- 37) Paper: Automatic power control of a VCSEL using an angled lid TO56 package
 - a. May 1998
 - b. 1998 Proceedings. 48th Electronic Components and Technology Conference
 - c. <http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=678694&url=http%3A%2F%2Fieeexplore.ieee.org%2Fiel4%2F5582%2F14953%2F00678694.pdf%3Farnumber%3D678694>
- 38) Paper: O/e-MCM packaging with new, patternable dielectric and optical materials
 - a. May 1998
 - b. Electronic Components & Technology Conference, 1998. 48th IEEE
 - c. <http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=678929&url=http%3A%2F%2Fieeexplore.ieee.org%2Fiel4%2F5582%2F14953%2F00678929.pdf%3Farnumber%3D678929>
- 39) Paper: ORMOCERs(TM)-new photo-patternable dielectric and optical materials for MCM-packaging
 - a. May 1998
 - b. Hybrid inorganic-organic polymers (ORMOCERs*) have been developed and tested in an ongoing EU-program (BE 7250 DONDOMCM) for evaluation in MCM applications. The photo-patternable materials with negative resist behavior are composed of inorganic oxidic structures cross-linked or substituted by organic groups. They are prepared from organosilane precursors by sol-gel-processing in combination with organic crosslinking of polymerizable organic functions. As a result of these functionalities the properties of the ORMOCERs can be adjusted to particular applications. Systematic variation of composition combined with adaptation to micro system technology allows great flexibility in processing. Some features of these materials are: Post baking at moderate temperatures (120 °C - 180 °C) enables processing on substrates such as FR-4 and BT. Combined use as dielectric and passivation layers in electrical systems and devices as well as core and cladding for optical applications enables e/o applications with high integration levels. Easily adaptable to thin film technology: spin-on with planarization >90% and via diameters down to 20 µm have been achieved
 - c. 1998 Proceedings. 48th Electronic Components and Technology Conference
 - d. <http://ieeexplore.ieee.org/xpl/articleDetails.jsp?reload=true&arnumber=678838&contentType=Conference+Publications>
- 40) Course (peer reviewed): "Optoelectronic devices and packaging: VCSEL technology"
 - a. May 1998
 - b. IEEE ECTC
 - c. <http://www.ectc.net>
- 41) Co-Chairman Optoelectronics session, 48th ECTC Conference
 - a. 25th May 1998
 - b. Co-chairman Optoelectronics session, 48th ECTC Conference Seattle, Washington

- c. ECTC, IEEE-CPMT, EIA/ECA
 - d. <http://www.ectc.net>
- 42) Invited Presentation and Abstract: VCSEL Technology - VCSEL technology is discussed with the work between AMP and MODE (division of EMCORE) fiber optics.
- a. Sep 1998
 - b. ECOC European Laser Workshop (in association with ECOC 1998, Madrid, Spain)
 - c. https://openlibrary.org/books/OL22322573M/ECOC_'98_24th_European_Conference_on_Optical_Communication
 - d.
- 43) Paper: Optical bistability in vertical cavity surface emitting lasers with a simple intra-cavity epitaxial absorber layer
- a. 4th Oct 1998
 - b. Conference Digest: Semiconductor Laser Conference, 1998. ISLC 1998 NARA. 1998 IEEE 16th International
- 44) Talk: Optical bistability in vertical cavity surface emitting lasers with a simple intra-cavity epitaxial absorber layer
- a. 4th Oct 1998
 - b. Conference Digest: Semiconductor Laser Conference, 1998. ISLC 1998 NARA. 1998 IEEE 16th International
 - c.
- 45) Paper: Vertical cavity surface emitting laser-based parallel optical data link
- a. Dec 1998
 - b. Optical Engineering, vol 37, no. 12, pp.3113-18, Dec. 1998.
 - c. http://spie.org/x648.html?product_id=318648
- 46) Paper: VCSEL devices and packaging
- a. Dec 1998
 - b. Proceedings of SPIE, ISSN 0277-786X, 05/2003, Volume 3289, Issue 1
 - c. <http://proceedings.spiedigitallibrary.org/proceeding.aspx?articleid=935769>

1999

- 47) Paper and Interviewed Article: Commercial VCSEL Manufacturing
- a. Apr 1999
 - b. Compound Semiconductor
- 48) Course (peer reviewed): "Optoelectronic devices and packaging: VCSEL and edge emitter technology"
- a. May 1999
 - b. IEEE Electronics and components technology conference; San Diego, California

- c. <http://www.ectc.net>

2000

- 49) Invited Panel Session: Opto Electronic Integrated Circuits - More IC than OE?
 - a. 5th Mar 2000
 - b. "The panel session focused on optical integration for communications. Other panel members included Brendan Hyland CEO of Kymata amongst others.
 - c. OSA Executive Forum: Photonics and Telecommunications: the tidal wave of the new millennium
 - d. <http://www.laserfocusworld.com/articles/2000/02/osa-executive-forum-at-ofc-2000.html>
- 50) Course: Optoelectronics Components and Modules for Datacom and Telecom
 - a. May 2000
 - b. Optoelectronics components and modules for the Telecommunication industry and Datacom Networks are rapidly advancing in terms of speed, lower cost and design. The main objectives of this course are to review the current and future trends for active devices and packaging technology for discrete components and data network modules. The course will cover in detail the fundamental active III-V devices and components used today and review current trends in both III-V device technology and packaging for telecom and datacom applications.
 - c. Proceedings 50th Electronics Components and Technology Conference May 2000
 - d. <http://www.thierry-lequeu.fr/data/Ectc/ECTC2000/ECTC2000.pdf>
- 51) Invited Presentation and Abstract: An investor's perspective on optical interconnects
 - a. 24th May 2000
 - b. The talk discusses the investor's perspective on optical interconnects from Intel Capital.
 - c. IEEE: Workshop on interconnections within high-speed digital systems
 - d. <http://www.oi-ieee.org/>
- 52) Invited Presentation: Optoelectronic Integration for Metro DWDM: Intel's perspective...
 - a. 3rd Sep 2000
 - b. As part of the ECOC conference in Munich Germany, this workshop invited 9 speakers to discuss the future of optical networking in metropolitan environments.
 - c. Electronicast Europe
 - d. <http://www.electronicastconsultants.com>
- 53) Keynote Presentation: Optoelectronics Integration for Metro DWDM, Intel's Perspective
 - a. 9th Oct 2000
 - b. Electronicast Corporations: Optical communications start-up and emerging companies conference

- c. <http://www.electronicastconsultants.com>
- 54) Panel Session: Semiconductors to Optics
 - a. 6th Nov 2000
 - b. Representing Intel at the conference, the panel explored the reasons why Intel was investing into photonics, optics, and fiber optic communications. Panel moderator was Drew Lanza, VC Morgenthaler.
 - c. JP Morgan communications components conference: the convergence of optical components and communications ICs
 - d. <http://www.thefreelibrary.com/Endwave+Founder+and+EVP+To+Speak+at+JP+Morgan+Communications...-a067529552>

2001

- 55) Paper: Optical components and their role in optical networks
 - a. 2001
 - b. Electronic Components and Technology Conference, 2001. Proceedings., 51st
 - c. http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=927765&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxppls%2Fabs_all.jsp%3Farnumber%3D927765
- 56) Invited Presentation: "Starting a company and hitting the ground running"
 - a. 7th Feb 2001
 - b. Storm Ventures limited partner meeting
 - c. <http://www.stormventures.com>
- 57) Keynote Talk: Industry 'Optomism'
 - a. 30th Apr 2001
 - b. Electronicast; Fiber Optics for the next decade conference; 13th Annual Monterey conference <http://www.electronicastconsultants.com>
- 58) Keynote Talk: Next decade in fiber optic communications
 - a. 1st May 2001
 - b. Electronicast: 13th Annual Fiber Optics for the Next Decade Conference
 - c. <http://www.photonics.com/Article.aspx?AID=8916>
- 59) Panel session: Next decade in fiber optic communications
 - a. 2nd May 2001
 - b. Electroicast: 13th Annual Fiber Optics for the Next Decade Conference
 - c. <http://www.photonics.com/Article.aspx?AID=8916>
- 60) Paper: OEICs: commercialization at last
 - a. Jul 2001
 - b. Compound Semiconductor, vol. 7. no. 6, pp. 81-2, 85, July 2001
 - c. <http://www.compoundsemiconductor.net/csc/features-details.php?cat=features&id=11719>

2002

- 61) Book chapter: "Optical sources: Light-emitting diodes and laser technology"
- a. Published 2002
 - b. "The Handbook includes chapters on all the major industry standards, quick reference tables, helpful appendices, plus a new glossary and list of acronyms. This practical handbook can stand alone or as a companion volume to DeCusatis: Fiber Optic Data Communication: Technological Advances and Trends (February 2002, ISBN: 0-12-207892-6), which was developed in tandem with this book.
 - c. Academic Press (1998, 2002); ISBN: 0-12-207892-6; Handbook of Fiber Optic Data Communication By Casimer DeCusatis
 - d. http://books.google.com/books?id=RIb6lKknl8IC&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false
- 62) Book chapter: "Semiconductor laser and light emitting diode fabrication"
- a. Published 2002
 - b. "The Handbook includes chapters on all the major industry standards, quick reference tables, helpful appendices, plus a new glossary and list of acronyms. This practical handbook can stand alone or as a companion volume to DeCusatis: Fiber Optic Data Communication: Technological Advances and Trends (February 2002, ISBN: 0-12-207892-6), which was developed in tandem with this book.
 - c. Academic Press: Editor DeCusatis: Fiber Optic Data Communication: Technological Advances and Trends (February 2002, ISBN: 0-12-207892-6)
 - d. <http://books.google.com/books?id=RIb6lKknl8IC&lpg=PP1&pg=PP1#v=onepage&q&f=false>
- 63) Keynote speech: "Business and Technical Perspectives for Optical Networking"
- a. 14th Jul 2002
 - b. PhoPack 2002 Stanford University
 - c. http://www.accessmylibrary.com/coms2/summary_0286-25792277_ITMhttp://books.google.com/books/about/LEOS_88.html?id=LUS0cQAACAAJ
- 64) Interview Optcon (Japan), "Ignis Optics: Small is beautiful"
- a. 15th Aug 2002
 - b. Overview of Ignis Optics strategy for fiber optic transceivers with innovative optoelectronic devices and packaging (in Japanese).
 - c. Optcon volume 8, no 161, pp50-51
 - d. <http://magissuelist.nichigai.co.jp/detail?id=000000098732>
- 65) Panel Session: An adventure into venture capital - lessons from silicon valley
- a. 12th Sep 2002

- b. Evening forum discussion chaired by Professor Richard Harrison, Chair, with panel members Pitch Johnson (VC), Brendan Hyland (Nutrior Ventures), Jane Karwoski (All-hotels Ltd), and Colin Rutherford (Intelli Partners). Sponsored by Scottish Development International, University of Edinburgh, British Council
- 66) Invited Paper: Elegant cost-effective optical subsystems for next generation optical networks
 - a. 13th Nov 2002
 - b. Electronicast: 4th Annual OADM and advanced photonics communication networks conference - market and technology trends, San Mateo, California
 - c. <http://www.electronicastconsultants.com/>

2004

- 67) Invited Paper (extended abstract) and Presentation: Automated commercial fabrication of wideband tunable lasers using ultra-high resolution e-beam lithography
 - a. 27th Oct 2004
 - b. IoP/CS-MAX extended abstract at the Compound Semiconductor Manufacturing Expo, Monterey, California, pp92-94 in the technical digest.
 - c. <http://www.compoundsemiconductor.net>

2005

- 68) Book: Optoelectronic Markets 2005
 - a. Jun 2005
 - b. Comprehensive market report and forecast of current optoelectronics markets, needs, technologies, and applications. This report forecasts the current state and direction of the optoelectronics industry.
 - c. OIDA
 - d. <http://www.oida.org/home/publications/oida-publication-report-library/>
- 69) Cover story/Interview: Does a foundry model add up for InP optoelectronics
 - a. Jul 2005
 - b. Interview with Michael Hatcher from Compound Semiconductor magazine. Volume 11, Number 7, August 2005 pp 17-19
 - c. Compound Semiconductor: Three-fives and silicon heterostructures
 - d. <http://www.compoundsemiconductor.net>

- 70) Short Article: President's Letter to OIDA Membership
 - a. Nov 2005
 - b. OIDA Newsletter, quarterly from 2005-2009
 - c. http://www.wsr-ods.com/files/oidanews_0408.pdf
- 71) Invited talk: Worldwide Optoelectronic Trends and Economic Opportunities.
 - a. 18th Nov 2005
 - b. UNCC 4th Annual symposium: UNC Charlotte Center for Optoelectronics and Optical Communications
 - c. <http://opticscenter.uncc.edu/node/275>

2006

- 72) Workshop: 100 Gb Ethernet: The Next Challenge for Communications Systems
 - a. 1st Oct 2006
 - b. Workshop chairman and editor of the report: Abstract: The communications market is continuously evolving to provide better and cheaper services. These changes have led to the movement away from the traditional voice-switched networks to more data-centric packet networks. This report seeks to examine the next generation of Ethernet devices as we strain the technology limits at 100 Gb/s? How will datacom and telecom networks differ in their approaches? OIDA [http://www.oida.org/home/publications/oida_publication_report_library/100_gb_ethernet_the_next_challenge_for_communi\(1\)/](http://www.oida.org/home/publications/oida_publication_report_library/100_gb_ethernet_the_next_challenge_for_communi(1)/)
 - c.
- 73) Workshop: The Challenge for Indium Phosphide Photonic Development and the Optical Foundry
 - a. 2006
 - b. "Workshop chairman and editor of the report.
 - c. Abstract: Indium Phosphide, InP, is a semiconductor material with properties that make it particularly suitable for optoelectronic devices. Optical communications requirements drove its initial development. Recently, the applications for InP semiconductor devices have broadened to include high-speed electronics and optical sensors. This report examines the current state of the InP device market and its future direction. Addresses challenges for a pure foundry play and the role for InP devices. Seeks to find the best ways to address the needs for InP device development in the U.S."
 - d. OIDA
 - e. http://www.oida.org/home/publications/oida_publication_report_library/the_challenge_for_indium_phosphide_photonic_develo/

- 74) Workshop: Nitride LED and Laser Technology and Its Impact on the Display, Medical, and Storage Industries
- 2006
 - Workshop chairman and editor of the report:
 - Abstract: Since the development of p-type material in 1989, research in nitride emitter technology has developed rapidly over the last 15 years. This material system provided a new range of color applications that could be better utilized and with far better reliability than the II-VI material system. This report examines material systems and developments for short wavelength (green-ultraviolet) lasers and LEDs with techniques such as color-mixing and phosphor conversion.
 - OIDA
 - http://www.oida.org/home/publications/oida_publication_report_library/nitride_led_and_laser_technology_and_its_impact_on/
 -
- 75) Invited Article: A New Model for the Optoelectronic Indium-based Semiconductor Industry
- May 2006
 - OSA: Optics and Photonics News
 - <http://www.osa-opn.org/Content/ViewFile.aspx?id=10456>
- 76) Book: Worldwide Optoelectronics Markets and Trends 2006
- Jun 2006
 - Comprehensive market report and forecast of current optoelectronics markets, needs, technologies, and applications. This report forecasts the current state and direction of the optoelectronics industry.
 - OIDA, 431 pages
 - http://www.oida.org/home/publications/oida_publication_report_library/2006_global_optoelectronics_industry_market_report/
- 77) Workshop: High Power Diode Laser Sources and Their Impact on Industrial, Medical, and Military Laser Industries
- 1st Jul 2006
 - Workshop chairman and editor of the report:
 - Abstract: High power semiconductor laser diodes are used in several different market segments today. The technology continues to advance and improvements in efficiency and power are reported each year. Semiconductor laser diodes are used either directly or indirectly to enable new applications or as a replacement for older technology approaches. This report examines practical implementations and limitations for lasers in the 100 W to 100 kW range and roadmaps and developments anticipated over the next five years.
 - OIDA
 - http://www.oida.org/home/publications/oida_publication_report_library/high_power_diode_laser_sources_and_their_impact_on/
- 78) Workshop: Biophotonic Sensors and Smart Fiber Optic Sensor Networks
- 1st Aug 2006

- b. Workshop chairman and editor of the report:
 - c. Abstract: This roadmap report examines biophotonic sensor opportunities from many perspectives including; government, industrial, university and venture capital. The markets, technologies, commercialization, and roadmap trends are presented in addition to promising areas for R & D.
 - d. OIDA
 - e. http://www.oida.org/home/publications/oida_publication_report_library/biophotonic_sensors_and_smart_fiber_optic_sensor_n/
- 79) Workshop: Wide Area Surveillance
- a. 1st Oct 2006
 - b. Workshop chairman and editor of the report:
 - c. Abstract: This report examines wide area surveillance of pipelines and other strategic infrastructure as it is rapidly becoming an important issue on a worldwide basis. The increasing need for surveillance for both homeland security as well as defense applications should make this commercially attractive to both the defense as well as to commercial industry. (Report is 62 pages followed by hard copies of presentations from the forum.)
 - d. OIDA
 - e. http://www.oida.org/home/publications/oida_publication_report_library/wide_area_surveillance/
- 80) Invited Talk: OIDA optoelectronics markets, technology and opportunities for optofluidics
- a. 20th Oct 2006
 - b. Organized by the DARPA center for optofluidics: translational research and commercialization workshop.
 - c. DARPA Optofluidics industry forum, UCSD San Diego, CA
 - d. <http://www.biophot.caltech.edu/optofluidics/>
- 81) Invited talk: Global optoelectronics technology roadmaps and trends
- a. 27th Oct 2006
 - b. UNCC 5th Annual Symposium: UNC Charlotte Center for Optoelectronics and Optical Communications
 - c. <http://opticscenter.uncc.edu/node/268>
- 82) Workshop: Artificial vision systems
- a. 1st Dec 2006
 - b. Workshop chairman and editor of the report:
 - c. Abstract: The ability to identify objects of interest and emerging threats around a vehicle in real time or by a warfighter looking for threats in a large field of view is currently severely hampered by the limitations of current algorithms and processing platforms. There have been recent advances in several technology areas, which if combined intelligently could solve this hard problem in enhancing situational awareness cost effectively. This report looks at the issues surrounding automated surveillance systems specifically looking at enhanced binoculars and convoy vehicle automated protection systems.

- d. OIDA
 - e. http://www.oida.org/home/publications/oida_publication_report_library/artificial_vision_systems/
- 83) Keynote address: Global perspectives in optoelectronics and photonics
- a. 6th Dec 2006
 - b. Photonics 21: European Union's 7th Framework Program Key Photonics Platform
 - c. http://www.photonics21.org/downloads/download_presentations.php

2007

- 84) Workshop: Micropackaging for the Next Generation of Optical and Electrical Components
- a. 2007
 - b. Workshop chairman and editor of the report:
 - c. Abstract: Optical components are ubiquitous. Applications that use them include DVD players, audio devices, cell phones, re-writable drives, projection displays, and communication devices. This report concentrates on the role of micropackaging for the for next generation fiber optic components with an eye towards lower cost and higher volume.
 - d. OIDA
 - e. http://www.oida.org/home/publications/oida_publication_report_library/micropackaging_for_the_next_generation_of_optical/
- 85) Workshop: Silicon Photonics: Challenges and Future, 2007
- a. 2007
 - b. Workshop chairman and editor of the report:
 - c. Abstract: Copper interconnects are currently used extensively within the data center environment. Fiber optic technology is used as a connectivity solution when higher performance is required and the cost differential compared to a copper solution is affordable. Fiber optic technology offers several key advantages over copper solutions for data transmission. This report looks at silicon photonics as a potential optical interconnect solution and addresses the issues and technology paths being pursued.
 - d. OIDA
 - e. http://www.oida.org/home/publications/oida_publication_report_library/silicon_photonics_challenges_and_future_2007/
- 86) Workshop: Photonic Sensors Roadmapping Report, 2007
- a. 2007
 - b. Workshop chairman and editor of the report:

- c. Abstract: This OIDA workshop report examines application specific sensor needs for both the government and the private sector with an emphasis on the oil and gas market, sensing function integration, cost reduction opportunities, and barriers and competing technologies.
 - d. OIDA
 - e. http://www.oida.org/home/publications/oida_publication_report_library/photonic_sensors_roadmapping_report_2007/
- 87) Paper: Fiber optic sensing technology: emerging markets and trends
- a. 2007
 - b. Third European Workshop on Optical Fibre Sensors.
 - c. Edited by Cutolo, Antonello; Culshaw, Brian; Lopez-Higuera, Joshua Miguel.
 - d. Proceedings of the SPIE, Volume 6619, pp. 661902 (2007). (SPIE Homepage)
 - e. <http://adsabs.harvard.edu/abs/2007SPIE.6619E...2H>
- 88) Article: "Optoelectronics Technology: New and Exciting Markets in Consumer and Entertainment"
- a. 10th Jan 2007
 - b. "The total optoelectronics components and enabled products grew 20% in 2005 to \$364 billion, from \$304 billion in 2004. Components grew 17% in 2005 to \$104 billion, from \$89 billion in 2004. When flat panel displays are excluded as components, components grew 10% in 2005 to \$30 billion, from \$27 billion in the previous year. Enabled products grew 21% to \$260 billion in 2005, from \$215 billion in 2004.
 - c. IEEE CPMT Santa Clara
 - d. <http://www.cpmpt.org/scv/meetings/cpmt0701.html>
- 89) Abstract and conference invited talk: The case for a photonics foundry in USA
- a. 27th April 2007
 - b. European Conference on Integrated Optics (2007): Towards foundries for photonic ICs
 - c. <http://www.epixnet.org/index.php?id=393>
- 90) Paper: Optoelectronics Roadmap OIDA-iNEMI optoelectronics for data communications, telecommunications, data center interconnects
- a. May 2007
 - b. IEEE Packaging and Assembly
- 91) Workshop: 100 Gbit Interconnects and Above: The Need for Speed
- a. 1st May 2007
 - b. Workshop chairman and editor of the report:
 - c. Abstract: The electronic society we live in today is seeing increased demand for data transfer, internet downloads, online applications, video sharing and storage. The electronic world of banks, companies, universities and governments require large secure datacenters connected to secure networks. This continuously drives for the development of more powerful servers and computer systems. This report examines needs and motivations for optical interconnect implementation. Looks

at the applications, history, market drivers, and future issues that affect this crossover.

- d. OIDA
 - e. http://www.oida.org/home/publications/oida_publication_report_library/100_gb_ethernet_the_next_challenge_for_communicati/
- 92) Book: 2007 Global Optoelectronics Industry Market Report and Forecast
- a. Jun 2007
 - b. Comprehensive market report and forecast of current optoelectronics markets, needs, technologies, and applications. This report forecasts the current state and direction of the optoelectronics industry.
 - c. OIDA, 517 pages
 - d. http://www.oida.org/home/publications/oida_publication_report_library/2007_global_optoelectronics_industry_market_report/
- 93) Paper: Growing at light speed
- a. The article discusses the significance of optoelectronics in high technology manufacturing industries. Optoelectronics components are being used in the manufacturing cameras of mobile phones, plasma display panel TVs and LCD TVs, among others. Since its application allows product differentiation and innovation, it has spurred growth in segments such as the consumer/entertainment, computer and communications industries. The article also discusses the differences in the material and processing equipment such as silicon photonics.
 - b. Sep 2007
 - c. IEEE Circuits Assembly; Sep 2007, Vol. 18 Issue 9, p44
 - d. <http://www.thefreelibrary.com/Growing+at+light+speed%3a+after+a+false+start%2c+OE+is+fast+becoming+a...-a0168812805>
- 94) Keynote/special invited talk: "10 Grand Challenges in Photonics"
- a. 31st Oct 2007
 - b. Sixth annual symposium UNCC Optoelectronics Center
 - c. <http://opticscenter.uncc.edu/node/265>

2008

- 95) Workshop: Perspectives on the Optoelectronics Industry: Manufacturing in the 21st Century, 2008
- a. 2008
 - b. Workshop chairman and editor of the report:
 - c. Abstract: This report provides insight and perspectives by senior-level representatives from industry on global trade and manufacturing practices in the

field of optoelectronics. Three areas examined are: 1) Can automation or optical integration relieve the momentum to outsource and off-shore manufacturing from North America? 2) The supply chain and the economics of manufacturing in the U.S., Europe, and Asia, and 3) The implications of offshore manufacturing on both the U.S. defense and commercial market sectors within the different fields of optoelectronics.

- d. OIDA
 - e. http://www.oida.org/home/publications/oida_publication_report_library/perspectives_on_the_optoelectronics_industry_manuf/
- 96) Workshop: Perspectives on the Optoelectronics Industry: Innovation, 2008
- a. 2008
 - b. Workshop chairman and editor of the report: Abstract: This report documents some of the issues raised at the Optoelectronics Industry Development Association (OIDA) forum and provides a review on the critical issue of innovation in the U.S. and the impact it has on future American competitiveness and technology leadership. This report looks at innovation and R&D from many perspectives: global, business, university, government funding agencies.
 - c. OIDA
 - d. http://www.oida.org/home/publications/oida_publication_report_library/perspectives_on_the_optoelectronics_industry_innov/
- 97) Workshop: Perspectives on the Optoelectronics Industry, 2008
- a. 2008
 - b. Workshop chairman and editor of the report:
 - c. Abstract: The United States is falling behind in the manufacturing, packaging, and assembling of optoelectronics products. Innovating technology may also be imperiled. This report is the result of the first of three optoelectronic forums sponsored by the Defense Advanced Research Projects Agency (DARPA). This report details the trends, findings, and directions for optoelectronics in each of these market applications. Included in the first chapter of this report is the global optoelectronics summary that was compiled by OIDA in 2007.
 - d. OIDA
 - e. http://www.oida.org/home/publications/oida_publication_report_library/perspectives_on_the_optoelectronics_industry_2008/
- 98) Workshop: Future Optical Communication Systems, 2008
- a. 2008
 - b. Workshop chairman and editor of the report:
 - c. Abstract: This report examines future optical communication needs and technologies. Topics include: Networks, Core, Metro, and Access Technology, photonic integration, and markets.
 - d. OIDA
 - e. http://www.oida.org/home/publications/oida_publication_report_library/future_optical_communication_systems_2008/
- 99) Book chapter: Being an Intrapreneur and Entrepreneur in the Optoelectronics Industry

- a. 2008
- b. This book provides actual entrepreneurial stories giving insight into the pitfalls and successes one might find in starting or even continuing with a small high-tech business. Insights into innovative, speculative, and (largely) successful new ventures, as experienced by those who went through the process, are complemented by comments and observations from others in the field including researchers, economists, investors, regional development agencies, technology transfer organizations, and universities. The book is recommended to entrepreneurs in all high technology disciplines and in particular for students and early career professionals. It can be also useful for undergraduate and postgraduate courses in entrepreneurship, which many institutions are currently introducing, and to those who are interested in how a high-tech business might develop.
- c. SPIE: Engineering a High-Tech Business: Entrepreneurial Experiences and Insights By JosÃ© Miguel LÃ³pez-Higuera, B. Culshaw (Editors) ISBN 978-0-8194-7180-2
- d. <http://books.google.com/books?hl=en&lr=&id=wXV9tffoGeYC&oi=fnd&pg=PR9&dq=michael+lebbby&ots=cYEwXIHMDc&sig=KlCtj2ZDgbOYEhnqKdHiMo6SdzA#v=onepage&q=michael%20lebbby&f=false>

2009

- 100) Workshop: Green Photonics: The Role of Optoelectronics in a Sustainable Future, 2009
 - a. 2009
 - b. Workshop chairman and editor of the report:
 - c. Abstract: This report explores the optoelectronics expectations for green photonics technology, and forecasts the associated markets through 2020. The cultural impact for a green, clean, and energy efficient lifestyle is just beginning. Over the next decade, many innovative new products will emerge in a variety of industries that will better define and demonstrate green photonics technology. It is clear to many that a broad range of products and services that the economy will utilize over the next decade will contain optoelectronics (interchangeable with the term photonics), either as key components or as components that enable better and more efficient systems.
 - d. OIDA
 - e. http://www.oida.org/home/publications/oida_publication_report_library/green_photonics_the_role_of_optoelectronics_in_a_s/
- 101) Conference: Optimism: "Powering the green revolution through photonics"

- a. 4th Jan 2009
 - b. "Co-chairman of Optimism conference with Pennwell.
 - c. OIDA and Pennwell (Laser Focus World)
 - d. <http://www.laserfocusworld.com/articles/print/volume-45/issue-4/world-news/conference-preview-optimism-to-emphasize-lesquogreenrsquo-growth.html>
- 102) Invited talk, short abstract, and session chairman: Energy Efficient Photonics
- a. 19th Mar 2009
 - b. Summary: Green photonics initiatives: The role of optoelectronics in a sustainable future...
 - c. European Commission: High Level Event on ICT for Energy Efficiency
 - d. http://ec.europa.eu/information_society/events/cf/ee09/item-display.cfm?id=2174
- 103) Trial & Cross: Testimony before the US-China economic and security review commission on the optoelectronics industry
- a. 24th Mar 2009
 - b. "Expert witness and testimony on Capitol Hill
 - c. Final oral comments: In preparing this testimony, many people I contacted stressed the importance of decisive action by the U.S. government and industry now. Optoelectronics sits at the intersection of multiple technical disciplines. U.S. universities and industry are particularly adept at bringing diverse people together to work on complex problems. We have, by the nature of our inherent diversity, an advantage. What for many presents a challenge, for us comes naturally. Thank you for this opportunity to present our industry's perspective. "
 - d. United States China Commission
 - e. http://www.uscc.gov/hearings/2009hearings/written_testimonies/09_03_24_wrts/09_03_24_lebby_statement.pdf
- 104) Report: Photonics industry-university collaborations (PICs)
- a. 1st Jun 2009
 - b. OIDA Final Technical Report
 - c. <http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=ADA502737>
- 105) Paper: Green photonics technology and markets
- a. Sep 2009
 - b. Green photonics technology will open up opportunities over the next decade for new and creative products to be designed as the interest in a green, clean and energy efficient lifestyle continues to grow. This overview forecasts the optoelectronics expectations for green photonics technology and associated markets over the next decade and explores just a few of the exciting opportunities from green photonics technology.
 - c. Electronics Letters, Vol 45, issue 20
 - d. <http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=5270369&url=http%3A%2F%2Fieeexplore.ieee.org%2Fiel5%2F2220%2F5270368%2F05270369.pdf%3Farnumber%3D5270369>
- 106) Paper: Photonic Integration: what is the Holy Grail?

- a. 14th Oct 2009
 - b. Compound Semiconductor
 - c. <http://compoundsemiconductor.net/csc/features-details.php?id=40435>
- 107) Keynote talk: Global optoelectronics and green photonics trends
- a. 28th Oct 2009
 - b. UNCC 8th Annual Symposium: Optoelectronics Center
 - c. <http://opticscenter.uncc.edu/node/255>
- 108) Keynote talk and abstract: Is this the rise of green photonics?
- a. Dec 2009
 - b. ICFO (Institut de Ciencies Fotoniques) Barcelona, Spain
 - c. <http://www.icfo.es/images/news/ICFO%20CLP%20DAY%20Program.pdf>
- 109) Book: 2009 Global Optoelectronics Industry Market Report and Forecast
- a. Dec 2009
 - b. Comprehensive market report and forecast of current optoelectronics markets, needs, technologies, and applications. This report forecasts the current state and direction of the optoelectronics industry.
 - c. OIDA, 545 pages
 - d. http://www.oida.org/home/publications/oida_publication_report_library/2009_global_optoelectronics_industry_market_report/
- 110) Video presentation: Living at the speed of light
- a. 10th Dec 2009
 - b. Living at the speed of light, hosted by renown physicist Michael Lebby, takes us on a fast paced fly through of the many facets of photonics and how the use of light touches the many aspects of our lives
 - c. National Research Council: Canadian Photonics Fabrication Centre
 - d. <http://www.youtube.com/watch?v=t8EB-1-lirY>
- 111) Book chapter: Packaging of Optical Components and Systems
- a. 27th Dec 2009
 - b. "In this article, several types of semiconductor optical components are introduced, and packaging of optical components and systems will be discussed. Specifically, three common types of optical sources will be addressed: light emitting diodes (LED), edge-emitting semiconductor lasers, and vertical cavity surface emitting lasers (VCSEL).
 - c. Wiley Encyclopedia of Electrical and Electronics Engineering; DOI: 10.1002/047134608X.W2106; originally published in 1999, Vol 15, pp 499-516; John G Webster (Editor)
 - d. <http://onlinelibrary.wiley.com/doi/10.1002/047134608X.W2106/abstract>

2010

- 112) Workshop: Fabrication Challenges and Opportunities in Photonics, 2010
- 2010
 - Workshop chairman and editor of the report: Abstract: This report examines different operational models employed by industry (fabless, fab-lite, pure play foundry and vertically integrated companies), and the role of governments in stimulating the growth of the photonics industry.
 - OIDA
 - http://www.oida.org/home/publications/oida_publication_report_library/fabrication_challenges_and_opportunities_in_photon/
- 113) Video and presentation: Green Photonics: Will it Change our Lives over the Next Decade?
- April 2010
 - Photonics is growing to enable new green technologies and products. Photonics already has a large presence in various modules and components with opportunities to expand to home displays, solar cells, lighting, and various consumer applications. The global optoelectronics industry has a strong outlook for growth in the near future, with even faster growth in green photonics. Green photonics can help reduce greenhouse gas emissions, generate or conserve energy, reduce pollution, and improve human health.
 - University of California, Santa Barbara: Institute of Energy Efficiency
 - <http://iee.ucsb.edu/node/1024>
- 114) Conference and workshop: 3rd Annual Green Photonics Forum (OIDA Green 2010)
- 10th Jun 2010
 - Conference chairman: OIDA's innovative green photonics forums have become a focal point for photonics and optics in the area of sustainable energy. The annual forum on green photonics, brings together key players involved in developing the technical and business roles of photonics in building a more sustainable and renewable future. Efficiency, monitoring, and energy generation are areas where photonics technology will play a key role and the photonics industry will deliver solutions.
 - OIDA
 - <http://www.clocate.com/conference/3rd-Annual-Green-Photonics-Forum-OIDA-Green-2010/4045/>
- 115) Paper: Silicon light emitting device based on rare earth oxide superlattice
- Sep 2010
 - 7th IEEE International conference on Group IV photonics, Beijing China
 - <http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=5643407&url=http%3A%2F%2Fieeexplore.ieee.org%2Fiel5%2F5623516%2F5643317%2F05643407.pdf%3Farnumber%3D5643407>

2011

- 116) Paper: Study of the Structural and Thermal Properties of Single Crystalline Epitaxial Rare-Earth-Metal Oxide Layers Grown on Si(111)
 - a. 2011
 - b. ECS Transactions 16, 161 (2011)
 - c. <http://ecst.ecsdl.org/content/41/3/161>
- 117) Webinar and presentation
 - a. 29th Mar 2011
 - b. "The future of photonics webinar and presentation: The Future of Photonics: Three Perspectives brings together three expert viewpoints on the future of the photonics industry (Michael Lebby will be the expert on market trends and photonic integrated circuits (PICs)). You will learn: global optoelectronics market outlook through 2021 trends in photonic integrated circuits over the next two decades."
 - c. Photonics Media
 - d. <http://www.photonics.com/Webinar.aspx?WebinarID=7>
- 118) Keynote invited speech: Green Photonics and GaN-on-Si for LEDs and Ge-on-Si for high Efficiency Multi-junction for PVs
 - a. Dec 2011
 - b. Conference proceedings: High Capacity Optical Networks and Enabling Technologies (HONET), 2011
 - c. <http://honet.uncc.edu/archive/honet11/speakers.htm>

2012

- 119) Paper: Structural and Thermal Properties of Single Crystalline Epitaxial Gd₂O₃ and Er₂O₃ Grown on Si(111)
 - a. 2012
 - b. ECS Journal of Solid State Science and Technology 1, N24 (2012)
 - c. <http://jss.ecsdl.org/content/1/2/N24.full.pdf+html>
- 120) Paper: Epitaxial Si, SiGe and Ge on binary and ternary rare earth oxide buffers
 - a. 2012
 - b. Phys. Status Solidi C 9, 2031 (2012)
 - c. <http://onlinelibrary.wiley.com/doi/10.1002/pssc.201200255/abstract>
- 121) Paper: Integrated high reflectivity silicon substrates for GaN LEDs
 - a. 13th Jan 2012

- b. Volume 9, Issue 3-4, pages 814-817, March 2012, physica status solidi (c)
 - c. <http://onlinelibrary.wiley.com/doi/10.1002/pssc.201100393/abstract>
- 122) Paper: Integrated high reflectivity silicon substrates for GaN LEDs
 - a. 13th Jan 2012
 - b. "Conference Publication: ICNS-9 "Contributed Article Integrated high reflectivity silicon substrates for GaN LEDs
 - c. F. Erdem Arkun*, Rytis Dargis, Robin Smith, David Williams, Andrew Clark, Michael Lebby
 - d. Article first published online: 13 JAN 2012" ICNS-9 "Contributed Article Integrated high reflectivity silicon substrates for GaN LEDs
 - e. <http://onlinelibrary.wiley.com/doi/10.1002/pssc.201100393/abstract>
- 123) Paper: Rare-earth-metal oxide buffer for epitaxial growth of single crystal GeSi and Ge on Si(111)
 - a. 1st Mar 2012
 - b. Conference and journal publication."Rare-earth-metal oxide buffer for epitaxial growth of single crystal GeSi and Ge on Si(111)"
 - c. With publication details: 28th North American Molecular Beam Epitaxy Conference, Published by AVS through the American Institute of Physics, 2012 ISBN 978-0-9836933-0-7 ISSN: 2166-27646 J.Vac.Sci.Technol B 30(2), Mar/Apr 2012 pp02B110-1 to pp-3B110-6
 - d. <http://ieeexplore.ieee.org/xpl/articleDetails.jsp?reload=true&arnumber=6118290&contentType=Journals+%26+Magazines>
- 124) Paper: Scalable virtual Ge templates for III-V integration on Si wafers
 - a. 18th April 2012
 - b. AIP Conference Proceedings / Volume 1477 / CONCENTRATOR SOLAR CELLS, CELL ASSEMBLIES AND RELATED MATERIALS
 - c. http://proceedings.aip.org/resource/2/apcpcs/1477/1/36_1?bypassSSO=1
- 125) Paper and talk: Engineering of the Interface Between Silicon and Rare-Earth Oxide Buffer for GaN growth
 - a. Sept 2012
 - b. ECS Meeting Oct 2013, San Francisco, USA
 - c. http://scholar.googleusercontent.com/scholar?q=cache:l3-oHWxNDzwJ:scholar.google.com/+%22michael+lebbly%22&hl=en&as_sdt=1,5&as_ylo=2013&as_vis=1
- 126) Paper: Scalable GaN-on-Silicon using rare earth oxide buffer layers
 - a. 9th Oct 2012
 - b. ECS Trans 2013 volume 50, issue 9, 1065-1071
 - c. <http://ma.ecsdl.org/content/MA2012-02/30/2538.short>

2013

- 127) Paper: Epitaxial Si and Gd₂O₃ Heterostructures - Distributed Bragg Reflectors with Stress Management Function for GaN on Si Light Emitting Devices
- 2013
 - ECS Trans 2013 volume 50, issue 4, 47-52
 - <http://ecst.ecsdl.org/content/50/4/47.short>
- 128) Article: OPTICAL MATERIALS: 'On-silicon' engineered substrates speed photonic device development
- 1st Apr 2013
 - Laser Focus World
 - <http://www.laserfocusworld.com/articles/print/volume-49/issue-04/features/optical-materials---on-silicon--engineered-substrates-speed-phot.html>
- 129) Paper & Poster: 100Gb/s Multi-guide vertical integration transmitter PIC in InP for fiber-optics interconnects
- 24th Sep 2013
 - Sasa Ristic and Michael Lebby, Valery Tolstikhin, and Kirill Pimenov,
 - ECOC 2013
 - <http://www.ecoc2013.org/sc2.html>
- 130) Paper: Epitaxial Si and Gd₂O₃ Heterostructures - Distributed Bragg Reflectors with Stress Management Function for GaN on Si Light Emitting Devices
- 1st Oct 2012
 - ECS J. Solid State Sci. Technol. 1, 246 (2012)
 - <http://jss.ecsdl.org/content/1/5/P246.full>
- 131) Growth of GaN by MOCVD on rare earth oxide on Si(111)
- 31st Oct 2013
 - ECS Transactions, 58, 455 (2013)
 - <http://ecst.ecsdl.org/content/58/4/455.short>
- 132) Invited talk/plenary: Next generation ICs using photonics integration
- 10th Dec 2013
 - Talk that reviews OneChip Photonics technology and in general PICs, OEICs, Silicon photonics, and how these technologies play into datacenters (data centers), data center interconnects, data communications, data center fiber management for client side high speed 100G fiber (fibre) optic transceiver interconnects and cabling.
 - IQE Capital markets day, Sky Pavillion, Rothschild Building, London, UK
 - <http://www.euroinvestor.com/news/2013/12/10/iqe-plc-capital-markets-day/12617916>
- 133) Poster paper: A versatile InP OEIC (PIC) platform enabling 100G+ coherent receiver and client-side transceiver engines
- 12th Nov 2013
 - Poster paper describing OneChip's latest results in coherent receivers, LR4 optical engines, and PSM4 optical engines.

- c. Silicon Photonics Workshop, Southampton University, UK
- d. http://www.orc.soton.ac.uk/UKSP_presents.html
- 134) Talk and panel session: Approaches for combining 3-5 and silicon, add functionality to Si photonics, heterogeneous versus hybrid integration, introduction of photonic platforms
 - a. 5th Dec 2013
 - b. Short presentation on PICs, OEICs, Si photonics, and combinations of these technologies from a revenue, investment, application and technology standpoint.
 - c. EPIC workshop: Meet or eat? collaboration and/or competition in photonic integrated circuits (PICs)
 - d. <http://epic-assoc.com/contact-us/?at=94>
- 135) Invited talk: Feedback USA/International related events
 - a. 5th Dec 2013
 - b. Feedback on the subject of InP PICs, OEICs, and silicon photonics from workshops and related international events from around the globe.
 - c. EPIC workshop: Meet or eat? Collaboration and/or competition in Photonic Integrated Circuits (PICs)?
 - d. <http://epic-assoc.com/contact-us/?at=94>

2014

- 136) Invited talk/plenary: High-Performance Datacenter Platform: Using InP for Silicon Photonics in data center environment
 - a. 8th Jan 2014
 - b. IEEE-CPMT/Photonics Society local chapter meeting, Santa Clara, California
 - c. <http://www.cpmc.org/scv/meetings/cpmt1401.html>
- 137) Invited talk/Panel session “Optical interconnect in datacenters”
 - a. 18th Mar 2014
 - b. "The 1st Optical Interconnect in Data Centers Symposium takes place on the 18th and 19th of March 2014 in Berlin/ Germany.
 - c. It is focused on high-performance, low-energy and low-cost and small-size optical interconnects across the different hierarchy levels in data center and high-performance computing systems: on-board, board-to-board and rack-to-rack.
 - d. EPIC: Symposium on optical interconnect in datacenters
 - e. <http://www.phoxtrot.eu/1st-optical-interconnect-in-data-centers-symposium/>
- 138) Keynote talk: Photonic integration in InP: A regrowth-free platform for fabless manufacturing model
 - a. 19th March 2014
 - b. CS International Conference Frankfurt, March 17th-20th 2014

- c. <http://cs-international.net/agenda.php>
- 139) Invited talk/Panel session: InP based photonics integration platform for datacenter and coherent communications
 - a. 2nd April 2014
 - b. Invited talk/panel session on the future of integrated photonics. Discussion was on both InP and silicon photonics technologies over the next decade.
 - c. Workshop on the future of Integrated Photonics organized by the Netherlands Office for Science & Technology is pleased to invite you to a workshop, occurring in conjunction with the upcoming Photonics West conference
 - d. <http://www.hollandinthevalley.com/panel-discussion-on-the-future-of-integrated-photonics/> that included data communications, datacenter applications, servers, routers, and data center switches.
- 140) Invited talk and abstract: Coherent Receiver Chip for 100G DP-QPSK
 - a. 30th April 2014
 - b. SIOE (Semiconductor and integrated optoelectronics) Conference, Cardiff, Wales, UK 29th April-1st May 2014, Institute of Physics
 - c. <http://www.astro.cardiff.ac.uk/research/cmp/events/resources/Sioeprogramme14final.pdf>
- 141) Invited talk/keynote lecture: Compound semiconductors driving photonics technologies to become the future for high-speed communications through integration, performance, and sustainability
 - a. 12th Jun 2014
 - b. Glyndwr University, Wales, UK
 - c. <http://www.glyndwr.ac.uk/en/AboutGlyndwrUniversity/Newsandmediacentre/Newsarchive/PressReleases2014/UniWeek/>
- 142) Invited Talk/Panel session: EPIC technology workshop on Photonic Integrated Circuits (PIC) packaging standardization
 - a. 18th Jun 2014
 - b. EPIC
 - c. <http://epic-assoc.com/contact-us/?at=94>
- 143) Invited talk: Compound Semiconductors (CS) driving photonics
 - a. 11th June 2014
 - b. Invited presentation for Welsh Gvt and commercial industry in epitaxial growth. The talk covered photonics: global markets, green photonics, photonics technology sectors (lighting, solar, displays, sensors, communications), integrated photonics and silicon photonics. Commercial industry invite by International Quantum Epitaxy (IQE)
 - c. Growth and application of epitaxial heterostructures with polymorphous rare earth oxides
 - d. Journal of Crystal Growth
 - e. <http://www.sciencedirect.com/science/article/pii/S0022024812009487>
- 144) Invited presentation for Day of Photonics at Glyndwr University: Photonics - markets, applications, integrated, next generation IC

- a. 21st Oct 2014
 - b. Invited presentation/lecture on photonics at the Glyndwr University.
 - c. Welsh Optoelectronic Forum (WOF)
 - d. http://www.wof.org.uk/home.php?page_id=4&event_id=317
- 145) Invited talk and moderator: Integrated photonics pilot lines
- a. 14th Nov 2014
 - b. "Photonics Pilot Line Workshop 14 November 2014 - Brussels, Belgium
 - c. European Commission and Photonics21
 - d. <http://www.photonics21.org/download/Events/DraftagendaPhotonicsPilotLineworkshop-Website.pdf>

2015

- 146) Invited talk: Integrated photonics roadmap synthesis
- a. 7th May 2015
 - b. Integrated Photonics Institute for Manufacturing Innovation (IP-IMI) site visit technical review:
 - c. The University of Southern California's (USC) Information Sciences Institute (ISI) is leading an effort with partner universities at the University of California-Los Angeles (UCLA), the University of California-Berkeley (UCB), the University of California-San Diego (UCSD), Arizona State University, the University of New Mexico, and the Ohio State University, as well as numerous industry partners, to develop the only California-based and led proposal to compete for the IP-IMI award. If successful, the proposal will receive a federal award of up to \$110 million over five years. A successful proposal requires 100 percent or more in matching funds (cash or in-kind) from state and local governments and from industry partners.
 - d. IPI-CDMS (Integrated Photonics Institute and Center for Design and Manufacturing Services)
 - e. <http://www.isi.edu/news/story/531784>
- 147) Invited talk and Chair panel session: EPIC workshop on photonic integrated circuits; "Global integrated photonics update and roadmaps"
- a. 9th Jun 2015
 - b. "Invited talk: Global integrated photonics update and roadmaps
 - c. Panel Session: Integrated photonics foundry status
 - d. EPIC trade association, Europe
 - e. <http://www.epic-assoc.com/epic-workshop-on-photonic-integrated-circuits/>
- 148) Keynote talk and invited abstract: "Integrated photonics as a vehicle for the next generation IC"

- a. 9th Sep 2015
 - b. Internet Technology Applications (ITA) ITA-15 conference Wrexham, Wales, UK 8-11th Sept 2015
 - c. <http://www.ita15.net/keynote-speaker/>
- 149) Press interview: "Building Big Business with the Next Generation Integrated Circuits!"
- a. 15th Sep 2015
 - b. "Insights from Michael Lebby, CEO OneChip Photonics Corporation, the keynote speaker at the Photonics Integration Conference
 - c. Photonics Integration Conference, organized by Jakajima, Netherlands
 - d. <http://www.phiconference.com/photonics/building-big-business-with-the-next-generation-integrated-circuits/>
- 150) Project advisor: European Commission ICT-28-2015 Cross-Cutting ICT KETs: Innovation Action (b) Pilot line for OLEDs on flexible substrates
- a. 20th Sep 2015
 - b. European Commission
 - c. <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/916-ict-28-2015.html>
- 151) Project advisor: European Commission ICT-28-2015 Cross-Cutting ICT KETs: Innovation Action (b) Pilot line for analytical mid-infrared (MIR) micro-sensors
- a. 22nd Sep 2015
 - b. European Commission
 - c. <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/916-ict-28-2015.html>
- 152) Keynote talk and abstract: "PIC the next generation IC..."
- a. 23rd Sep 2015
 - b. Photonic Integration Conference, organized by Jakajima, Netherlands
 - c. <http://www.phiconference.com/program/>
- 153) Project advisor: European Commission ICT-28-2015 Cross-Cutting ICT KETs: Innovation Action (b) Pilot line for PIC fabrication on III-V and/or dielectric based platforms for PICs (Photonic Integrated Circuits)
- a. 24th Sep 2015
 - b. European Commission
 - c. <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/916-ict-28-2015.html>
- 154) Session organizer/Committee member: Market Focus at ECOC exhibit 2015
- a. 28th Sep 2015
 - b. Session organizer/Committee member: Market Focus at ECOC exhibit 2015 with sessions in broadband access, datacentres, service provider optical transmission, network agility/SDN, photonics integration and packet optical transport. Nexus Business Media Ltd

- c. <http://webcache.googleusercontent.com/search?q=cache:Qb68vjzhV5IJ:www.ecocexhibition.com/visitorhome/marketfocus2015/cfs+&cd=1&hl=en&ct=clnk&gl=us&client=safari>

2016

- 155) Reviewer: European Commission ICT-29-2016: Photonics KET 2016 (section a(i) Biophotonics: advanced imaging for in-depth disease diagnosis)
 - a. 10th May 2016
 - b. European Commission
 - c. <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5094-ict-29-2016.html>
- 156) Reviewer: European Commission ICT-29-2016: Photonics KET 2016 (a(iii) Pervasive high-specificity and high-sensitivity sensing for a safer environment)
 - a. 12th May 2016
 - b. European Commission
- 157) Reviewer: European Commission ICT-29-2016 Photonics KET (b) Innovation Actions (i) Application driven core photonic devices integrated in systems.
 - a. 14th May 2016
 - b. European Commission
 - c. <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5094-ict-29-2016.html>
- 158) European Commission Reviewer: European Commission ICT-29-2016 Photonics KET (b) Innovation Actions (ii) Pilot line for assembly and packaging
 - a. 15th May 2016
 - b. European Commission
 - c. <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5094-ict-29-2016.html>
 - d. <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5094-ict-29-2016.html>
- 159) Invited Talk: Annual Shareholder Meeting 2016 - Market Perspective LWLG Polymer Photonics vs Legacy Devices
 - a. 20th May 2016
 - b. Presentation to investor group at Lightwave Logic's Annual Shareholder Meeting Lightwave Logic
 - c. <http://lightwavelogic.com/company-updates/>
- 160) Technical presentation for Lightwave Logic Inc., at the Annual Shareholder Meeting (ASM).
 - a. 20th May 2016

- b. Lightwave logic Inc., Boulder, Colorado.
- c. Annual shareholder meeting for Lightwave Logic Inc., with live presentation with live Q&A from investors
- 161) Invited Presentation and abstract: "High-Performance Polymer Photonics for Next-Generation Photonic Integrated Circuits"
 - a. 3rd Oct 2016
 - b. ECOC Market Focus by ECOC Exhibition
 - c. <http://www.ecocexhibition.com/marketfocus>
- 162) Video Interview: ECOC Market Focus on Datacenters and emerging new PIC technologies that include silicon and polymer photonics
 - a. 3rd Oct 2016
 - b. Video taped interview by ECOC Exhibition Market Focus on Datacenters, data communications, high performance computing, data center fiber management and emerging new PIC technologies that include polymer photonics.
 - c. ECOC Exhibition
 - d. <http://www.ecocexhibition.com/interviews2016>
- 163) Panel session: European Commission ICT-29-2016: Photonics KET 2016 (section a(ii) Breakthrough in miniaturization of SSL light engines and systems); comment on industry and academic technology.
 - a. 5th Nov 2016
 - b. <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5094-ict-29-2016.html>
- 164) Reviewer: European Commission ICT-29-2016: Photonics KET 2016 (section a(ii) Breakthrough in miniaturization of SSL light engines and systems)
 - a. 5th Nov 2016
 - b. European Commission: Reviewing submitted technical photonics proposals for Horizon 2020, and rate proposals to EU guidelines.
 - c. <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/5094-ict-29-2016.html>

2017

- 165) Invited Talk and Panelist: Emerging Technologies Summit; Integrated Photonics session, Stanford University, as part of the Kingdom of the Netherlands trade mission to Silicon Valley
 - a. 10th Jan 2017
 - b. "Discussion with HRH Prince Constantijn and DG Bertolt Loeffink about photonics ecosystem and startups. Photonics highlights (Michael Lebby)
 - c. Consulate General San Francisco, The Kingdom of Netherlands

- d. <https://ez.atavist.com/emerging-technologies-summit>
- 166) Video: The importance of photonics roadmapping
 - a. 30th Jan 2017
 - b. Video on the importance of roadmapping photonics technologies at Photonics West San Francisco, 30th Jan 2017. Interview by Photon Delta.
 - c. <http://www.photondelta.eu>
- 167) Technical Advisor/Expert: 2nd review of MIRPHAB pilot line consortium funded by H2020 at European Commission
 - a. 20th Feb 2017
 - b. 2nd review for MIRPHAB consortium at the European Commission, Brussels
 - c. European Commission, Brussels
 - d. <https://www.iaf.fraunhofer.de/en/research/research-areas/semiconductor-lasers/mirphab.html>
- 168) Technical Advisor/Expert: 2nd review of PI-SCALE project pilot line funded by H2020, European Commission
 - a. 21st Feb 2017
 - b. 2nd review of PI-SCALE consortium pilot line at European Commission, Brussels
 - c. European Commission, Brussels, Belgium
 - d. <http://pi-scale.eu>
- 169) Technical Advisor/Expert: 1st review of PIXAPP pilot line consortium funded by H2020 at European Commission
 - a. 21st Feb 2017
 - b. 1st Review of Pixapp project at EU Commission as part of the pilot line project.
 - c. European Commission, Brussels
 - d. <http://www.fabiodisconzi.com/open-h2020/projects/206352/index.html>
- 170) Invited Talk: Belgium LWLG Investor Group at the Royal Antwerp Golf Club
 - a. 6th Mar 2017
 - b. Invited talk entitled "High performance polymer photonics for next generation PICs"
 - c. Belgium LWLG Investor Group
 - d. <http://www.lightwavelogic.com>
- 171) Chairman: PIC (Photonic Integrated Circuits) International Conference, Brussels, Belgium
 - a. 7th Mar 2017
 - b. "Photonic Integrated Circuits International
 - c. CS International
 - d. <http://www.picinternational.net>
- 172) Invited Talk: Photonics Integration Circuits - Global Market Analysis 2017
 - a. 13th Mar 2017
 - b. Invite by The Netherlands Department of Economics to review PIC technology and markets for potential investment.

- c. The Dutch Government - Dept of Economics, The Hague together with Photon Delta, The Netherlands
- d. <http://www.photondelta.eu>
- 173) Technical Advisor/Expert: 2nd review of PIX4LIFE pilot line consortium funded by H2020 at European Commission
 - a. 14th Mar 2017
 - b. 2nd review of PIX4LIFE pilot line consortium at the European Commission, Brussels.
 - c. European Commission, Brussels, Belgium
 - d. <http://www.pix4life.eu>
- 174) Keynote talk: Entitled "The rise of PIC based technologies over the next decade and how datacenters and telecom may enable other exciting applications"
 - a. 1st May 2017
 - b. Xilinx as part of their; "Xilinx silicon technology series seminars"
 - c. <http://www.xilinx.com> The talk included analysis on data centers, data communications, high performance computing, and fiber management systems that included routers, switches, servers and data center racks.
- 175) Invited Talk: Lightwave Logic Inc Annual Shareholder Meeting "High Performance Polymer Photonics for Next Generation PICs"
 - a. 18th May 2017
 - b. Presentation of corporate technology and strategy for Lightwave Logic Inc and polymer PIC platforms.
 - c. Lightwave Logic Inc (OTCQB:LWLG)
 - d. <http://www.lightwavelogic.com/presentations>
- 176) Management/CEO presentation for Lightwave Logic Inc., at the Annual Shareholder Meeting (ASM).
 - a. 18th May 2017
 - b. Lightwave logic Inc., Boulder, Colorado.
 - c. Annual shareholder meeting for Lightwave Logic Inc., with live presentation with live Q&A from investors.
- 177) Plenary Talk: Global Market Research at the World Technology Mapping Forum, s'Hertogenbosch, Netherlands
 - a. 14th Jun 2017
 - b. "PhotonDelta and the AIM Photonics Academy are organising the first meeting of the World Technology Mapping Forum. The goal of the forum is to produce the first International Photonic Systems Roadmap, looking ahead to global technology needs in 2030 and beyond.
 - c. PhotonDelta, Netherlands as part of the International Photonics System Roadmap (IPSR) conference
 - d. <https://worldtechnologymappingforum.org/the-programme>
- 178) Video interview: World Photonic Mapping Forum; s'Hertogenbosch, Netherlands
 - a. 15th Jun 2017
 - b. Interview on photonics roadmaps.

- c. PhotonDelta (via Videographer Jonathan Marks)
- d. <https://worldtechnologymappingforum.org/the-programme>
- 179) Invited video 'Lightwave Logic roadmaps for polymer photonics at the 3rd International Roadmap conference, Eindhoven, Netherlands
 - a. 16th June 2017
 - b. PhotonDelta video PR team
 - c. <https://vimeo.com/317216466> Roadmap included directions for data communications, data centers, and high performance computing.
- 180) Invited talk and abstract: Polymer based PICs
 - a. 14th Sep 2017
 - b. ECOC, Datacenter technologies. Sweden
- 181) Video: Polymer based PICs
 - a. 15th Sep 2017 ECOC, Sweden as part of Market Focus at the ECOC Exhibit. (youtube: Michael Lebby ECOC 2017) with applications with data centers, high performance computing, and data communications.
- 182) Keynote invited talk and abstract: PIC based technologies
 - a. 22nd Sep 2017
 - b. PIC Conference, The Netherlands
- 183) Invited talk and abstract: Polymer PIC technology as part of the Photonics Integrated Circuits (PIC) conference in Eindhoven, Netherlands.
 - a. 5th Oct 2017
 - b. PIC technologies and polymer photonics
- 184) Invited talk: PIC Training conference/workshop in Sunnyvale, Silicon Valley
 - a. PIC training session/workshop
 - b. Talk included details on data center interconnect, high performance computing, roadmap for next generation data center interconnect technology.
- 185) Invited talk: Photonics Pilot Lines
 - a. 8th Dec 2017
 - b. European Commission, Photonics Proposers Meeting, Brussels

2018

- 186) International Roadmap meeting at Berenshot, Utrecht, Netherlands
 - a. 20th Jan 2018
 - b. Invited talk: International Roadmap meeting: Datacom/Telecom ICT markets, AOC, and Polymer PIC technology platforms including data communications, high performance computing, data center interconnect.
- 187) Co-Chairman: PIC (Photonic Integrated Circuits), International Conference, Brussels, Belgium

- a. 10th Apr 2018
 - b. Photonic Integrated Circuits International
 - c. CS International
 - d. <http://www.picinternational.net>
- 188) Session chair and moderator: High volume, high performance PICs (Photonic Integrated Circuits) at the International Conference, Brussels, Belgium
- a. 10th Apr 2018
 - b. Photonic Integrated Circuits International
 - c. CS International
 - d. <http://www.picinternational.net>
- 189) Session chair and moderator: Silicon Photonics (SiP) PICs (Photonic Integrated Circuits) at the International Conference, Brussels, Belgium
- a. 11th Apr 2018
 - b. Photonic Integrated Circuits International
 - c. CS International
 - d. <http://www.picinternational.net>
- 190) Invited Talk: Scalable PIC platforms: “The impact of using polymer PICs for 100 and 400Gbps datacom applications,” PICs (Photonic Integrated Circuits) at the International Conference, Brussels, Belgium
- a. 10th Apr 2018
 - b. Photonic Integrated Circuits International
 - c. CS International
 - d. <http://www.picinternational.net>
- 191) Management/CEO presentation for Lightwave Logic Inc., at the Annual Shareholder Meeting (ASM).
- a. 17th May 2018
 - b. Lightwave logic Inc., Denver, Colorado.
 - c. Annual shareholder meeting for Lightwave Logic Inc., with live presentation with live Q&A from investors.
- 192) Invited video ‘Welcome to WTMF 18’ at the 2nd International Roadmap conference, Eindhoven, Netherlands
- a. 12th June 2018
 - b. PhotonDelta video PR team
 - c. <https://vimeo.com/275376937>
- 193) Reviewer: European Commission ICT-03-2018: Photonics Pilot lines (InP and silicon photonics PICs)
- a. 11th Jun 2018
 - b. European Commission: Reviewing submitted technical photonics proposals for Horizon 2020, and rate proposals to EU guidelines.
 - c. <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020>
- 194) Reviewer: European Commission ICT-04-2018: Tbps optical fiber optic transceivers
- a. 11th Jun 2018

- b. European Commission: Reviewing submitted technical photonics proposals for Horizon 2020, and rate proposals to EU guidelines.
 - c. <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020>
- 195) Reviewer: European Commission ICT-04-2018: Connected lighting
 - a. 11th Jun 2018
 - b. European Commission: Reviewing submitted technical photonics proposals for Horizon 2020, and rate proposals to EU guidelines.
 - c. <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020>
- 196) Workgroup chair and moderator: Telecom long haul roadmap committee at the International world mapping conference, Enschede, Netherlands
 - a. 20th Jun 2018
 - b. Photondelta Conference: chairing technical workgroup meetings to address photonics roadmap trends and challenges.
 - c. Photondelta in coordination with iNEMI, and AIM photonics.
 - d. <https://www.photondelta.eu>
- 197) Invited talk: Telecom, Datacom, and ICT roadmap committee at the International world mapping conference, Enschede, Netherlands
 - a. 20th Jun 2018
 - b. Photondelta Conference: chairing technical workgroup meetings to address photonics roadmap trends and challenges that included high performance computing, data centers, and data communications
 - c. Photondelta in coordination with iNEMI, and AIM photonics.
 - d. <https://www.photondelta.eu>
- 198) Invited talk and abstract: Pushing the performance of 50Gbps NRZ polymer modulators towards 100Gbps NRZ in a PIC platform to access 400 and 800Gbps data-rates
 - a. 25th Sep 2018
 - b. ECOC, Datacenter technologies. Sweden
- 199) Reviewer (European Commission) for pilot line PISCALE
 - a. 18th Sept 2018
 - b. European Commission, Brussels
 - c. PISCALE is a pilot line that is focused on bringing to commercial market flexible organic display technologies in both panel and reel to reel formats.
- 200) Reviewer (European Commission) for pilot line MIPHAB
 - a. 19th Sept 2018
 - b. European Commission, Brussels
 - c. MIPHAB is a pilot line that is focused on bringing to commercial market near infra-red devices and packaging for industrial, defense, military and high volume applications.
- 201) Video: Pushing the performance of 50Gbps NRZ polymer modulators towards 100Gbps NRZ in a PIC platform to access 400 and 800 Gbps datarates.
 - a. 25th Sept 2018

- b. ECOC, Market Focus at the ECOC Exhibit, (Youtube: Michael Lebby ECOC 2018)
- 202) Invited talk and abstract: ECOC [International Symposium on Hybrid PICs](#) entitled "Polymer PICs: technology and prospects"
 - a. 26th Sept 2018
 - b. International Symposium on Hybrid PICs co-located at the ECOC conference, Rome, Italy.
 - c. The talk included high performance computing, data centers, and data communications
- 203) Reviewer (European Commission) for pilot line PIXAPP
 - a. 2nd Oct 2018
 - b. European Commission, Brussels
 - c. PIXAPP is a pilot line that is focused on bringing to commercial market PIC (photonic integrated circuit) packaging solutions for InP and silicon photonics based technologies.
- 204) Reviewer (European Commission) for pilot line PIX4LIFE
 - a. 3rd Oct 2018
 - b. European Commission, Brussels
 - c. PIX4LIFE is a pilot line that is focused on bringing to commercial market PIC dielectric solutions for applications in the visible wavelength range in the medical applications market.

2019

- 205) Invited talk: Polymer modulators and polymer PIC technologies: PIC Training conference/workshop in Sunnyvale, Silicon Valley
 - a. 28th Jan 2019
 - b. PIC training session/workshop at Keysight facility
 - c. The talk included high performance computing, data centers, and data communications
- 206) Reviewer (European Commission) for pilot line MIPHAB
 - a. 16th Feb 2019
 - b. European Commission, Brussels
 - c. MIPHAB is a pilot line that is focused on bringing to commercial market near infra-red devices and packaging for industrial, defense, military and high volume applications.
- 207) Reviewer (European Commission) for pilot line PIX4LIFE
 - a. 25th Mar 2019
 - b. European Commission, Brussels

- c. PIX4LIFE is a pilot line that is focused on bringing to commercial market PIC dielectric solutions for applications in the visible wavelength range in the medical applications market.
- 208) Co-Chairman: PIC (Photonic Integrated Circuits), International Conference, Brussels, Belgium
 - a. 26-27th Mar 2019
 - b. Photonic Integrated Circuits International
 - c. The talk included photonics for high performance computing, data centers, and data communications
 - d. <http://www.picinternational.net>
- 209) Session chair and moderator: High volume, high performance PICs (Photonic Integrated Circuits) for Foundries at the International Conference, Brussels, Belgium
 - a. 26th Mar 2019
 - b. Photonic Integrated Circuits International
 - c. CS International
 - d. <http://www.picinternational.net>
- 210) Session chair and moderator: High volume PICs (Photonic Integrated Circuits) at the International Conference, Brussels, Belgium
 - a. 27th Mar 2019
 - b. Photonic Integrated Circuits International
 - c. CS International
 - d. <http://www.picinternational.net>
- 211) Invited Talk: Polymer PICs for 400Gbps+ datacom applications,” PICs (Photonic Integrated Circuits) at the International Conference, Brussels, Belgium
 - a. 27th Mar 2019
 - b. Photonic Integrated Circuits International
 - c. CS International
 - d. <http://www.picinternational.net>
- 212) Reviewer (European Commission) for project CARDIS
 - a. 18th Apr 2019
 - b. European Commission, Brussels
 - c. CARDIS is an EU project for PIC based technology to monitor blood flow and artery stiffness in the human body using long wavelength lasers and silicon photonics.
- 213) Management/CEO presentation for Lightwave Logic Inc., at the Annual Shareholder Meeting (ASM).
 - a. 16th May 2019
 - b. Lightwave logic Inc., Denver, Colorado.
 - c. Annual shareholder meeting for Lightwave Logic Inc., with live presentation with live Q&A from investors with presentation:
<https://drive.google.com/file/d/1wh8irF8rmi9bU6VeGKAHFqVURyUcytdX/view?usp=sharing>

- 214) Reviewer: European Commission ICT-03-2019: Fiber optic communications and bio-photonics for medical applications
 - a. 6th June 2019
 - b. European Commission: Reviewing submitted technical photonics proposals for Horizon 2020, and rate proposals to EU guidelines.
 - c. <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020>
- 215) Workgroup chair and moderator: Datacom roadmap committee at the International world mapping conference, Berlin, Germany
 - a. 12th June 2019
 - b. Photondelta Conference: chairing technical workgroup meetings to address photonics roadmap trends and challenges.
 - c. Photondelta in coordination with iNEMI, and AIM photonics.
 - d. <https://www.photondelta.eu>
- 216) Keynote speaker: 'Global markets for PIC technologies' at the 3rd International world mapping conference, at the Fraunhofer HHI, Berlin, Germany
 - a. 15th June 2019
 - b. Photondelta Conference: chairing technical workgroup meetings to address photonics roadmap trends and challenges.
 - c. Photondelta in coordination with iNEMI, and AIM photonics.
 - d. <https://www.photondelta.eu>
- 217) Reviewer: European Commission ICT-05-2019: Pilot lines (free form optics and integrated photonics for bio-medical applications)
 - a. 16th June 2019
 - b. European Commission: Reviewing submitted technical photonics proposals for Horizon 2020, and rate proposals to EU guidelines.
 - c. <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020>
- 218) Invited speaker: 'Lightwave Logic polymer modulator platform' at the Spring Investor Conference, NYC, NY
 - a. 2nd April 2019
 - b. Spring Investor Summit (Microcap Conference) (www.springinvestorsummit.com)
- 219) Invited video 'Lightwave Logic polymer modulator platform' at the Spring Investor Conference, NYC, NY
 - a. 2nd April 2019
 - b. Spring Investor Summit (Microcap Conference)
 - c. <https://www.youtube.com/watch?v=Mn4oICQpVTQ>
- 220) Invited video 'Lightwave Logic advancing its silicon photonic prototypes' by Proactive, (<https://www.proactiveinvestors.com>) NY
 - a. 2nd April 2019
 - b. Proactive video (Wall St) series:
<https://www.youtube.com/watch?v=3B0oGXvyogA>
 - c. Lightwave Logic, Inc. (OTCQX: LWLG) CEO Michael Lebby tells Proactive the Englewood, Colorado-based technology platform company is in discussions with

- large and small players within the telecommunications and data-communications space, including companies who are involved in the manufacturing routers.
- 221) Reviewer: (European Commission) for project InSiDe
 - a. 29th Apr 2019
 - b. European Commission, Brussels
 - c. InSiDe is an EU project for PIC based technology in the medical field to monitor blood flow and artery stiffness in the human body using long wavelength lasers and silicon photonics. Hospital clinical trials will be conducted. It is a follow-on with more clinical trials from the initial CARDIS EU project.
 - d. <http://www.inside-h2020.eu>
 - 222) Invited video Interview by EPIC CTO Jose Pozo in EPIC's Photonics Industry Luminary video series.
 - a. 28th Jan 2019 (at Photonics West conference in San Francisco)
 - b. EPIC Trade Association, Europe
 - c. https://www.youtube.com/watch?v=e_V4TeTSwaM
 - 223) Invited video 'Global Markets and Trends' at the 3rd International Roadmap conference, Faunhofer HHI, Berlin Germany
 - a. 16th June 2019
 - b. PhotonDelta video PR team
 - c. <https://vimeo.com/341952732>
 - 224) Reviewer (European Commission) for pilot line PISCALE
 - a. 11th Sept 2019
 - b. European Commission, Brussels
 - c. PISCALE is a pilot line that is focused on bringing to commercial market flexible organic display technologies in both panel and reel to reel formats.
 - 225) Invited talk and abstract: ECOC International Symposium on Hybrid PICs entitled "Polymer modulators enable the next generation of speeds and low power in optical networks"
 - a. 22nd Sept 2019
 - b. International Symposium and workshop (WO5) on Hybrid PICs,
 - c. ECOC conference 2019, Dublin, Ireland
 - d. <https://www.ecoc2019.org/workshop.html> The talk included photonics for high performance computing, data centers, and data communications
 - 226) Invited talk and abstract: "Polymer modulators with >50GHz performance for power consumption reduction at 400, 800, and 1600 Gbaud aggregated data-rates"
 - a. 24th Sept 2019
 - b. Market Focus Session, Photonics Integration and Digital Silicon Photonics,
 - c. ECOC 2019, Dublin, Ireland
 - d. <https://www.ecocexhibition.com/visit/market-focus/market-focus-2019-timetable/>
 - 227) Video: Polymer modulators with >50GHz performance for power consumption reduction at 400, 800, and 1600 Gbaud aggregated datarates"
 - a. 24th Sept 2019

- b. ECOC, Market Focus at the ECOC Exhibit, (Youtube: Michael Lebby ECOC 2019)
- c. ECOC 2019, Dublin, Ireland
- 228) Chairman and moderator, Market Focus ECOC 2019 session: Service and Content Provider Optical Transmission
 - a. 24th Sept 2019
 - b. Market Focus Session #5, ECOC 2019, Dublin, Ireland
 - c. <https://www.ecocexhibition.com/visit/market-focus/market-focus-2019-timetable/>
- 229) Chairman and moderator, Market Focus ECOC 2019 session: Optical Network Agility/Software Defined Networks
 - a. 24th Sept 2019
 - b. Market Focus Session #7, ECOC 2019, Dublin, Ireland
 - c. <https://www.ecocexhibition.com/visit/market-focus/market-focus-2019-timetable/>
- 230) Reviewer (European Commission) for pilot line MIPHAB
 - a. 10th Dec 2019
 - b. European Commission, Brussels
 - c. MIPHAB is a pilot line that is focused on bringing to commercial market near infra-red devices and packaging for industrial, defense, military and high-volume applications.

2020

- 231) Webinar: Wall Street resource
 - a. 9th Jan 2020
 - b. Lightwave Logic HQ facilities in Denver, Colorado
 - c. A 30min recorded webinar answering questions on Lightwave Logic and its business plans, technology and plans for the future.
- 232) Invited video Interview by EPIC in EPIC's Photonics Industry video series on European funded pilot lines.
 - a. 5th Feb 2020 (at Photonics West conference in San Francisco)
 - b. EPIC Trade Association, Europe
- 233) Reviewer (European Commission) for pilot line InPULSE
 - a. 19th Mar 2020
 - b. European Commission, Brussels
 - c. InPULSE is a pilot line that is focused on bringing to commercial market InP based photonic integrated circuits (PICs) for fiber communications, both datacom as well as telecom high-volume applications.
- 234) Keynote and Plenary speaker SPIE Photonics Europe International Conference
 - a. Originally 31st March (then moved to 7th April 2020)

- b. Strasbourg, France (the plenary talk was completed using audio embedded powerpoint video remotely).
 - c. The conference was held virtually in 2020 and the talk was attended by over 1000 attendees/visits.
 - d. <https://spie.org/profile/michael.lebby-4009?SSO=1>
- 235) Chairman (elected) of ECOC Market Focus technical committee as part of the ECOC Exhibition.
- a. 10th May 2020
 - b. Committee hosted and organized by ECOC Exhibition
 - c. Market Focus Committee at: : <https://www.ecocexhibition.com/visit/market-focus/>
- 236) Invited speaker and presentation at Lightwave Logic Annual Shareholder meetings 2020 with Business Management Update, and presentation entitled, “Lightwave logic business review”
- a. 14th May 2020
 - b. Presentation can be found at:
https://drive.google.com/file/d/1xfisLKe6QIykCAIMjOZ0XdiR-Ht_O7zZ/view?usp=sharing
 - c. Hosted by Lightwave Logic Inc. and MZ Group (Investor Relations)
 - d. Co-Chair (and summit host) of online summit for PIC International virtual session with live Q&A. The talk included photonics for high performance computing, data centers, and data communications
 - e. 19th May 2020
 - f. Hosted by Angel Tech (<https://onlinesummit.angel-tech.net/breakout/pic-international>)
 - g. Virtual conference with combination of pre-recorded presentations, live presentations, and live Q&A. Over 150 attendees.
- 237) Invited video clip on PIC technologies for online summit of PIC International conference.
- a. 19th May 2020
 - b. Video clip (2:04) can be found at <https://onlinesummit.angel-tech.net/breakout/pic-international>
 - c. Summit host’s introduction to the online summit PIC conference.
- 238) Invited speaker, EPIC 24hr Photonics World Tour virtual conference with talked entitled; “EO Polymers enable high speed and low power modulators at 1550nm and 1310nm.”
- a. 24th Jun 2020
 - b. EPIC 24hr Photonics World Tour final talk #72 and concluding remarks.
 - c. <https://www.epic-assoc.com/24hours/> and video on Youtube at:
<https://www.youtube.com/watch?v=aiUSlfxPlz0> starting at 46:00
- 239) Invited paper/article entitled, “Electro-Optic Polymers Improve Speed and Power Efficiency” with co-authors Karen Liu and Cory Pecinovsky, Lightwave Logic Inc.
- a. 5th Aug 2020

- b. Published by Photonics Spectra magazine,
 - c. Hosted by photonics.com [https://www.photonics.com/Articles/Electro-Optic Polymers Improve Speed and Power/p5/vol180/i1193/a65902](https://www.photonics.com/Articles/Electro-Optic%20Polymers%20Improve%20Speed%20and%20Power/p5/vol180/i1193/a65902)
- 240) Invited video interview, “2020 Market Focus and technology trends for ECOC 2020, Brussels, Belgium” as Chairman of ECOC 2020 Market Focus Technical Committee
- a. 5th Aug 2020
 - b. Market Focus Exhibition for ECOC 2020,
 - c. Hosted by ECOC exhibition: <https://www.ecocexhibition.com/visit/market-focus/>
- 241) Chair and invited speaker, PIC International virtual conference on PICs: PIC Virtual II with presentation entitled; “Optical devices and industry roadmaps.”
- a. 2nd Nov 2020
 - b. PIC International Conference,
([https://picmagazine.net/article/112351/AngelTech_Virtual_2_-
The_Sequel_Proves_A_Hit_Success](https://picmagazine.net/article/112351/AngelTech_Virtual_2_-_The_Sequel_Proves_A_Hit_Success)) and (<https://onlinesummit.angel-tech.net>)
- 242) Invited speaker, EPIC Virtual Conference on Datacenters (in collaboration with EA and COBO) with presentation entitled; “Using polymer modulators to upgrade your PIC + Industry Roadmaps.”
- a. 4th Nov 2020
 - b. EPIC Trade Association and subsequent YouTube video
(<https://www.youtube.com/watch?v=tHh-z724D2g>) and also at EPIC:
<https://www.epic-assoc.com/epic-online-technology-meeting-on-datacenter-interconnects-in-cooperation-with-cobo-and-ea/>
 - c. Hosted by EPIC
 - d. Hosted by CS International and PIC International (Angel Business, London)
- 243) Reviewer (European Commission) for pilot line PIX4LIFE
- a. 2nd Dec 2020
 - b. European Commission, Brussels (virtual review)
 - c. PIX4LIFE is a pilot line that is focused on bringing to commercial market PIC dielectric solutions for applications in the visible wavelength range in the medical applications market.

2021

- 244) Invited speaker, EPIC Photonics Plus conference (virtual) with a talk entitled “Polymer Plus™: Upgrading your PIC with Ultrafast and Low Power Modulators.”
- a. 16th Feb 2021
 - b. EPIC Trade Association <https://photonicsplus.com> and also at EPIC:
<https://photonicsplus.com/exhibitors/>

- c. Hosted by EPIC
- 245) Invited speaker (updated virtual presentation), EPIC Photonics Plus conference (virtual) with a talk entitled “Commercializing Polymer Modulators.”
 - a. 10th Mar 2021
 - b. EPIC Trade Association <https://photonicsplus.com> and also at <https://www.lightwavelogic.com/presentation/video-presentation-commercializing-polymer-modulators/>
 - c. Hosted by EPIC
- 246) Invited Webinar and panelist: Roth Capital Partners (<https://www.roth.com/Page/Corporate-Access-Past-Conferences>)
 - a. 17th Mar 2021
 - b. 33rd Annual Roth Conference
 - c. Financial investment conference for public company review. Panelist for answering questions by bankers, investment specialists, and fund managers on Lightwave Logic and its business plans, technology and plans for the future.
- 247) Invited white paper/article entitled, “Polymers for Fiber Optic Communications: What does the Integrated Photonics Roadmap Say” co-authors Michael Lebby and Karen Liu, Lightwave Logic Inc.
 - a. 24th Mar 2021
 - b. Published by Lightwave Logic Inc., (https://www.lightwavelogic.com/wp-content/uploads/sites/319/2021/03/WP_IPSR-Roadmap-Decoded.pdf)
 - c. Executive summary: The IPSR (Integrated Photonic Systems Roadmap), a recent broad collaboration that unified the efforts of multiple established photonics roadmap efforts, describes the key technology bottlenecks for a broad array of applications and most promising solutions to overcome them. This whitepaper highlights the portion of the roadmap specific to fiber optic communications and within that the implications for the role of electro-optic polymers. Key findings identify critical advances that will be needed over the next decade to support the growth of very high data rate applications. By the end of the decade, integration of electronics with photonics will be part of broad integrated platforms. Innovative materials technologies such as polymers can be useful to enhance integrated photonics platforms with the use of high- speed modulators and passive optical interconnects.
- 248) Reviewer (European Commission) for pilot line Phabulous
 - a. 31st Mar 2021
 - b. Via European Commission (virtual review)
 - c. Phabulous is a pilot line that is focused on bringing to commercial market micro-optics and free-form optics technology. Focus is on SMEs, prototyping and small volume manufacturing.
- 249) Chair and invited speaker, PIC International virtual conference on PICs: PIC Virtual III with presentation entitled; “Integrated photonic roadmaps.”
 - a. 12th Apr 2021

- b. PIC International Conference,
(https://picmagazine.net/article/112351/AngelTech_Virtual_2_-_The_Sequel_Proves_A_Hit_Success) and (<https://onlinesummit.angel-tech.net>)
- c. Hosted by CS International and PIC International (Angel Business, London)
- 250) Reviewer (European Commission) for pilot line InPULSE (also known as Jeppix)
 - a. 23rd Apr 2021
 - b. Via European Commission (virtual review)
 - c. InPULSE is a pilot line that is focused on bringing to commercial market InP based photonic integrated circuits (PICs) for fiber communications, both datacom as well as telecom high-volume applications.
- 251) Invited speaker, EPIC Virtual Conference on PIC Packaging with presentation entitled; “Integrated photonics roadmaps: enabling high performance packaging.”
 - a. 26th Apr 2021
 - b. EPIC Trade Association and subsequent YouTube video
(<https://www.youtube.com/watch?v=tHh-z724D2g>) and also at EPIC:
<https://www.epic-assoc.com/epic-online-technology-meeting-on-pic-packaging/>
 - c. Hosted by EPIC
- 252) Invited conference and panelist: Oppenheimer 6th Annual Virtual Emerging Growth Conference (<https://www.oppenheimer.com/events/2021/6th-annual-emerging-growth-conference.aspx>)
 - a. 11th May 2021
 - b. Oppenheimer 6th Annual Virtual Emerging Growth Conference.
 - c. Financial investment conference for public company review. Panelist for answering questions with a variety of bankers, investment specialists, and fund managers on Lightwave Logic and its business plans, technology and plans for the future.
- 253) Invited speaker and presentation at Lightwave Logic Annual Shareholder meetings 2021 with Business Management Update, and presentation entitled, “Lightwave logic business review”
 - a. 27th May 2021
 - b. Presentation can be found at: <https://www.lightwavelogic.com/presentation/2021-asm-business-update-por-lightwave-logic-ceo-dr-michael-lebby/>
 - c. Hosted by Lightwave Logic Inc. and MZ Group (Investor Relations)
- 254) Keynote speaker for PITC opening ceremony with presentation entitled, “Photonic Integrated Circuits (PICs): Enabling our future...”
 - a. 2nd June 2021
 - b. Agenda at: <https://brainporteindhoven.com/en/events/launch-photonics-integration-technology-center> and presentation at:
<https://www.lightwavelogic.com/presentation/photonic-integration-technology-center-keynote/>
 - c. Hosted by PITC (Photonics Integrated Technology Center); Photon Delta, TNO, Eindhoven University, Twente University.

- 255) Invited speaker: LD Micro Invitational XI conference (virtual) with presentation entitled, “Lightwave Logic Investor Presentation”
- 10th June 2021
 - Presentation at: <https://api.mziq.com/mzfilemanager/v2/d/307dbc8b-e212-48ba-9968-8cef3f6b5188/8c054319-48a6-bd6b-2a0c-66e56f5f489f?origin=2>
 - Hosted by LD Micro NASDAQ: SRAX
- 256) Invited video interview: “2021 Market Focus and technology trends for ECOC 2021, Bordeaux, France” as Chairman of ECOC 2021 Market Focus Technical Committee
- 15th June 2021
 - Market Focus Exhibition for ECOC 2021,
 - Hosted by ECOC exhibition: <https://www.ecocexhibition.com/visit/market-focus/>
- 257) Invited speaker at HC Wainwright non-deal roadshow (virtual)
- 3rd and 4th August 2021
 - Presentation of “Lightwave Logic investor presentation”
 - Hosted by HC Wainwright Investment Bank
- 258) Invited speaker at Q3 Investor Summit (virtual)
- 17th and 18th August 2021
 - Presentation of “Lightwave Logic investor presentation” and link: <https://drive.google.com/file/d/1mH0bCzOd8UxtvN6FeR50KIP7moFsFhjJ/view?usp=sharing>
 - Hosted by Investor Summit (<https://investorsummitgroup.com>)
- 259) Invited speaker and video recording at HC Wainwright conference (virtual)
- 13-15th September 2021
 - Presentation of “Lightwave Logic investor presentation”
 - Hosted by HC Wainwright Investment Bank
- 260) Invited speaker and video interview at NASDAQ for 10th September 2021 marketing closing. Live interview at NASDAQ HQ in Times Square, NYC.
- 10th September 2021
 - Live interview for TV networks of Lightwave Logic’s aspirations.
 - Hosted by NASDAQ at their TV studios: <https://www.nasdaq.com/videos/lightwave-logic-inc.-rings-the-nasdaq-stock-market-opening-bell>
- 261) Invited interview to close the week of trading at NASDAQ on 10th September, 2021 with live speech, and televised session. The closing was carried by CNBC, FOX, Bloomberg, BNN networks during the close session.
- 10th September, 2021
 - Live interview for Lightwave Logic, and live market closing for NASDAQ
 - Hosted by NASDAQ at their TV studios: <https://youtu.be/8dmHC8MeF6E>
- 262) TV and video interview by TD Ameritrade in conjunction with the ringing of the closing bell at NASDAQ on 10th September, 2021
- 10th September 2021

- b. Live TV interview on TD Ameritrade at NASDAQ studios, Time Square, NYC
 - c. Hosted by TD Ameritrade financial network;
<https://tdameritradenetwork.com/video/rB4A-HvPH-2Be9Hw1tYC0w>
- 263) Session chairman: ECOC Market Focus technical committee as part of the ECOC Exhibition: sessions included PIC and Silicon Photonics, Optics in Cloud computing, optical transmission (SDN, network agility), Fiber Access, 5G, Cable, PON, FTTX, FTTC, Fiber to the room, New technologies and optical systems, New markets, and new packaging platforms.
- a. 13th September 2021
 - b. Committee hosted and organized by ECOC Exhibition
 - c. Market Focus Committee at : <https://www.ecocexhibition.com/visit/market-focus/>
- 264) Invited video interview: “2021 Market Focus impact for ECOC 2021, Bordeaux, France” as Chairman of ECOC 2021 Market Focus Technical Committee at the conference by ECOC TV <https://www.youtube.com/watch?v=VrFeSwqnWak>
- a. 13th September 2021
 - b. Market Focus Exhibition for ECOC 2021,
 - c. Hosted by ECOC exhibition: <https://www.ecocexhibition.com/visit/market-focus-with-video-at>
- 265) Invited talk and abstract: “Advancing integrated photonics with elector-optic polymer modulators”.
- a. 13th September 2021
 - b. Market Focus Session, PIC and SiPH/Datacenters/Optics in cloud computing,
<https://www.ecocexhibition.com/visit/market-focus/market-focus-2021-session-details/>
 - c. ECOC 2021, Bordeaux, France
- 266) Award winner: Acceptance of glass trophy for ECOC Industry awards on behalf of Lightwave Logic in the optical integration category:
<https://www.ecocexhibition.com/visit/ecoc-exhibition-industry-awards/>
- a. 14th September 2021
 - b. Product Focus session, ECOC Exhibition Industry Award Winner Announcement
 - c. ECOC 2021, Bordeaux, France
- 267) Interview: ECOC Industry awards on behalf of Lightwave Logic in the optical integration category by ECOC TV
- a. 14th September 2021
 - b. Product Focus session, ECOC Exhibition Industry Award Winner Announcement
 - c. ECOC 2021, Bordeaux, France
- 268) Video interview: PIC International Conference November 9-11, Brussels, Belgium
- a. 24th September 2021
 - b. Overview of conference, technical sessions, and integrated photonics
 - c. PIC International, Brussels, Belgium as part of the online web portal presence.

- 269) Reviewer (European Commission) for pilot line Medphab
 - a. 21st Sep 2021
 - b. Via European Commission (virtual review) is a pilot line that is focused on bringing to commercial market silicon photonics based technologies for medical applications. Demonstrator use-cases as prototype products have been selected for the validation of the pilot line technologies covering both *in-vivo* and *in-vitro* domains. The cases include: manufacturing a disposable plasmonic-fluidic sensors and a wearable PCI temperature sensor.
 - c. <https://medphab.eu>
- 270) Reviewer: (European Commission) for pilot line MIRPHAB
 - a. 28th Sep 2021
 - b. Via European Commission (virtual review)
 - c. MIRPHAB is a pilot line that is focused on bringing to commercial market infra-red wavelength modules and technologies based on quantum cascade lasers, MIR detectors, Antimonide based compound semiconductors and their associated packaging.
 - d. <https://www.iaf.fraunhofer.de/en/research/research-areas/semiconductor-lasers/mirphab.html>
- 271) Reviewer: (European Commission) for pilot line InPULSE (also known as Jeppix)
 - a. 1st Oct 2021
 - b. Via European Commission (virtual review)
 - c. InPULSE is a pilot line that is focused on bringing to commercial market InP based photonic integrated circuits (PICs) for fiber communications, both datacom as well as telecom high-volume applications.
 - d. <https://www.inpulse.jeppix.eu>
- 272) Invited Video presentation: LD Micro Main Investor conference entitled “Investor Presentation for LD Micro”
 - a. 12th October 2021
 - b. For virtual attendees at the LD Micro conference in Los Angeles (Luxe Hotel), California
 - c. Invited video presentation for virtual audience at LD Micro main event in LA California: https://www.meetmax.com/sched/event_76871/conference_home.html
 - d. <https://www.youtube.com/watch?v=JEvSV8qYGMA>
- 273) Invited audio interview: LD Micro for BIZPOD (the Drill Down by Cory Johnson).
 - a. 12th October 2021
 - b. Located at LD Micro main in LA, California
 - c. BIZPOD audio interview as part of their start-up entrepreneur series: <https://www.bizpod.net>
- 274) Invited oral presentation: Includes Q&A for LD Micro Main Investor conference entitled “Investor Presentation for LD Micro”
 - a. 12th October 2021

- b. For live in-person attendees at the LD Micro conference in Los Angeles (Luxe Hotel), California
 - c. Invited live presentation on Lightwave Logic technology and business plans for virtual audience at LD Micro main event in LA California:
https://www.meetmax.com/sched/event_76871/conference_home.html
 - d. <https://www.youtube.com/watch?v=JEvSV8qYGMA> and
https://me21.mysequire.com/recording?session_id=d354f581-6ab6-47d9-99de-d642c1c25d87
- 275) Invited Video presentation: Ladenburg Thalmann Virtual Technology Expo conference entitled “Investor Presentation for Ladenburg Thalmann virtual Technology Expo Investor Presentation”
- a. Video-taped on 27th October 2021 for release on 18th November 2021
 - b. For virtual attendees at the Thalmann Virtual Technology Expo conference.
 - c. Invited video presentation for virtual audience at 2021 Ladenburg Thalmann Virtual Technology Expo: <https://ladenburg21.mysequire.com>
 - d. Presentation can be found at: <https://ladenburg21.mysequire.com>
- 276) Invited video: Chairmans introduction to the 5th PIC International Conference, www.picinternational.net,
- a. 7th-10th November 2021
 - b. Conference hosted by Angel events.
 - c. Sheraton Airport Hotel, Brussels, Belgium.
- 277) Session Chairman: 2nd PIC Pilot Line Conference, , www.picinternational.net,
- a. 7th November 2021
 - b. Conference hosted by Angel events.
 - c. Sheraton Airport Hotel, Brussels, Belgium.
- 278) Keynote speaker: Includes presentation entitled, “PIC Pilot Lines: Competitive Positioning” as part of the of 2nd PIC Pilot Line Conference, , www.picinternational.net,
- a. 7th November 2021
 - b. As of the conference hosted by Angel events.
 - c. Sheraton Airport Hotel, Brussels, Belgium.
- 279) Session chairman: 5th PIC International conference, www.picinternational.net
- a. 8-10th November 2021
 - b. Conference hosted by Angel events together with CS International, SSI International, and PIC Pilot Line Conference.
 - c. Sheraton Airport Hotel, Brussels, Belgium.
- 280) Invited Panelist: For the panel entitled, “PICs for LIDAR” of 6th PIC International conference, www.picinternational.net
- a. 8-10th November 2021
 - b. Conference hosted by Angel events together with CS International, SSI International, and PIC Pilot Line Conference.
 - c. Sheraton Airport Hotel, Brussels, Belgium.

- 281) Invited speaker: With presentation entitled, “Increasing power efficiency with electro-optic (EO) polymers” at the 5th PIC International conference, www.picinternational.net in the day 2 session, “PICs vision- evolution and revolution”
- 8-10th November 2021
 - Conference hosted by Angel events together with CS International, SSI International, and PIC Pilot Line Conference.
 - Sheraton Airport Hotel, Brussels, Belgium.
- 282) Keynote speaker: For Macrotrends (<http://arnaarteconomics.com/dagvandetips2020/>) investor conference (<https://vimeo.com/653240070>) and talk entitled “Investor Presentation”
- 12th November 2021
 - Conference hosted by Marcotrends with 200 in person attendees, and 3-500 online attendees.
 - Ghent, Belgium
- 283) Invited Live TV interview: Benzinga (Spencer Israel show).
- TV interview on 7th Dec 2021 with youtube recording: <https://www.youtube.com/watch?v=kS-7FVTNE2Y>
 - Presentation can be found at: <https://www.youtube.com/watch?v=kS-7FVTNE2Y> and the Spencer Israel show/background at <https://www.linkedin.com/in/spencer-israel-44b02b31/> and <https://www.benzinga.com/author/spencer-israel>

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- 284) Invited Live TV interview: Benzinga (Spencer Israel show).
- TV interview on 11th Feb 2022 with youtube recording: <https://www.youtube.com/watch?v=jFiB9P3voUk>
 - Presentation can be found at: <https://www.youtube.com/watch?v=jFiB9P3voUk> and the Spencer Israel show/background at <https://www.linkedin.com/in/spencer-israel-44b02b31/> and <https://www.benzinga.com/author/spencer-israel>
- 285) Invited Webinar and panelist: Roth Capital Partners at the 34th Annual Roth Dana Point Conference, (<https://www.roth.com/Page/Corporate-Access-Past-Conferences>) with Lightwave Logic investor presentation and meetings.
- 13-15th March 2022
 - 34th Annual Roth Deer Valley Conference (invite only)
 - Financial investment conference for public company review. Panelist for answering questions by bankers, investment specialists, and fund managers on Lightwave Logic and its business plans, technology and plans for the future.
- 286) Invited Article and Interview entitled: “Q&A: Electro-optic polymers herald a new age of ultra-fast communication.” With Digital Journal (<https://www.digitaljournal.com>), and interviewer; Dr. Tim Sandle.

- a. Digital Journal interview and publication on 1st April 2022 in the Digital Journal.
- b. Article and interview can be found at: <https://www.digitaljournal.com/tech-science/qa-electro-optic-polymers-herald-a-new-age-of-ultra-fast-communication/article>
- 287) Invited Article entitled: “Electro-optic polymers allow faster, more efficient data transmission.” With Broadband Communities (<https://www.bbcmag.com>)
 - a. Published in Broadband Communities 13th April 2022.
 - b. Article can be found at:
https://www.bbcmag.com/pub/doc/BBC_Mar22_webFINAL.pdf
- 288) Invited video: Chairmans introduction to the 6th PIC International Conference, www.picinternational.net, recorded on 10th May 2022.
 - a. 8th May 2022 to be published in May 2022 for the conference being held on 27-29th June 2022
 - b. Conference hosted by Angel events.
 - c. Sheraton Airport Hotel, Brussels, Belgium.
- 289) Invited speaker at Oppenheimer 7th Annual Emerging Growth Conference (virtual)
 - a. 10th May 2022
 - b. Presentation of “Lightwave Logic investor presentation”
 - c. Hosted by Oppenheimer Investment Bank:
https://www.meetmax.com/sched/event_80933/conference_invlogin.html?event_id=80933&username=LWLG&confirmation_number=MVRJ8BYW865 and
<https://www.oppenheimer.com/events/2022/7th-annual-emerging-growth-conference.aspx>
- 290) Invited interview: Authority Magazine: “The future of communication technology”
 - a. 11th May 2022, and published 18th May 2022.
 - b. Interview on the future of communications, hosted by
<https://medium.com/authority-magazine>
 - c. Interview with David Liu, Authority Magazine
- 291) Reviewer (European Commission) for pilot line InPULSE (also known as Jeppix)
 - a. 17th May 2022
 - b. Via European Commission (virtual review)
 - c. InPULSE is a pilot line that is focused on bringing to commercial market InP based photonic integrated circuits (PICs) for fiber communications, both datacom as well as telecom high-volume applications.
- 292) Invited speaker and presentation at Lightwave Logic Annual Shareholder meetings 2022 with Business Management Update, and presentation entitled, “Lightwave logic CEO management review”
 - a. 26th May 2022
 - b. Presentation can be found at: <https://www.lightwavelogic.com/presentation/2021-asm-business-update-por-lightwave-logic-ceo-dr-michael-lebby/> and stream-

- video
at: https://viaavid.webcasts.com/starthere.jsp?ei=1544482&tp_key=3c8d96d340
- c. Hosted by Lightwave Logic Inc. and MZ Group (Investor Relations)
- 293) Invited oral presentation: LD Micro 12th Annual LD Micro Invitational conference with presentation entitled, “Lightwave Logic”
- a. 7th June 2022
- b. Presentation Webcast can be found at: <https://me21.mysequire.com/>
- c. Hosted by LD Micro NASDAQ: SRAX and located at Four Seasons in Westlake Village, California on 7-8th June 2022.
- 294) Invited video presentation: LD Micro XII Annual Invitational conference, recorded on 25th May 2022 (<https://ldinv12.sequireevents.com>)
- a. 7th June 2022
- b. Presentation at: : <https://me21.mysequire.com/>
- c. Hosted by LD Micro NASDAQ: SRAX at the Four Seasons in Westlake Village, California on 7-8th June 2022.
- 295) Invited speaker and presentation at MIT IPSRI roadmap event with presentation entitled “Transceiver roadmap 2022”.
- a. 10th June 2022
- b. Presentation can be found at: <https://photonicsmanufacturing.org/how-get-involved>
- c. and <https://www.eventbrite.com/e/2022-spring-ipsr-i-roadmap-meeting-tickets-323380047427>
- d. Hosted by IPRSI, MIT, and PhotonDelta world photonics roadmap
- 296) Board member Optica’s Corporate Engagement Council, with activities focusing on industrial membership, marketing, conferences, workshops, meetings etc., for the photonics community globally.
- a. 10th June 2022, election to the CEC (https://www.optica.org/en-us/about/leadership_and_volunteers/councils/councils/)
- b. CEC listing: https://www.optica.org/en-us/about/leadership_and_volunteers/councils/councils/#Industry
- c. Optica (Optical Society of America – previous name)
- 297) Reviewer: European Commission HORIZON-CL4-2022-DIGITAL-EMERGING-01-38 (CSA): International cooperation in semiconductors
- a. 8th June 2022
- b. European Commission: Reviewing submitted technical and coordinated support actions for electronics and photonics proposals for Horizon 2022 evaluation calls and rate proposals to EU guidelines.
- c. CSA: <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020>
- 298) Reviewer: European Commission HORIZON-CL4-2022-DIGITAL-EMERGING-01-03: Advanced multi-sensing systems.
- a. 10th June 2022

- b. European Commission: Reviewing submitted technical photonics proposals for Horizon 2022 evaluation calls and rate proposals to EU guidelines.
- c. RIA: <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020>
- 299) Invited live interview with Dan Loney, Wharton Business Daily Radio Station
 - a. 15th June 2022
 - b. Wharton Business Daily live radio interview. Subject: Lightwave Logic business and technology plans for growth: <https://twitter.com/whartonbizdaily?lang=en>
 - c. Location: virtual recording at Lightwave Logic, Englewood, CO.
- 300) Invited speaker at Diamond Equity Research Emerging Growth Invitational Conference (virtual)
 - a. 17th June 2022
 - b. Presentation of “Lightwave Logic investor presentation”
 - c. Hosted by Diamond Equity Research Bank: <https://www.diamondequityresearch.com/conferences/> at Lightwave Logic, Englewood, Colorado.
- 301) Invited video interview: “2022 Market Focus impact for ECOC 2022, Basel, Switzerland” as Chairman of ECOC 2022 Market Focus Technical Committee at the conference by ECOC TV (link to be published)
 - a. 17th June 2022
 - b. Market Focus Exhibition, technical sessions and awards for ECOC 2022,
 - c. Hosted by ECOC exhibition: <https://www.ecocexhibition.com/ecoc-exhibition-2022/> and recorded virtually in San Francisco, CA.
- 302) Invited interview: MicrocapDaily: “Microcapdaily Interviews Dr. Michael Lebby CEO of Lightwave Logic, Inc. (NASDAQ: LWLG) On Radical Innovation Needed to Keep the Internet Growing”
 - a. 23rd June 2022
 - b. Interview on the radical innovation needed for the internet and optical networking, hosted by <https://microcapdaily.com/microcapdaily-interviews-dr-michael-lebby-ceo-of-lightwave-logic-inc-nasdaq-lwlg-on-radical-innovation-needed-to-keep-the-internet-growing-2/>
 - c. Interview with Boe Rimes, Microcap Daily
- 303) Session chairman: 7th PIC International conference, www.picinternational.net
 - a. 28-29th June 2022
 - b. Conference hosted by Angel events together with CS International and SSI International.
 - c. Sheraton Airport Hotel, Brussels, Belgium.
- 304) Invited Panelist: For the panel entitled, “Optica Industry Panel: Hybrid Integration” of 6th PIC International conference, www.picinternational.net
 - a. 28-29th June 2022
 - b. Conference hosted by Angel events together with CS International, and SSI International.
 - c. Sheraton Airport Hotel, Brussels, Belgium.

- 305) Invited speaker: With presentation entitled, “Enabling low power consumption optical networking using high speed, low power polymer modulators” at the 6th PIC International conference, www.picinternational.net in the day 2 session, “Optimizing the PIC architecture”
- 28-29th June 2022
 - Conference hosted by Angel events together with CS International, and SSI International.
 - Sheraton Airport Hotel, Brussels, Belgium.
- 306) Invited speaker: “Status of Lightwave Logic and electro-optic polymers” at the Cleydael Golf Club, Antwerp, Belgium (www.cleydael.be)
- 30th June 2022
 - Meeting organized by Belgium and Dutch retail investors of Lightwave Logic Inc. (NASDAQ:LWLG)
 - Location: Belgium
- 307) Invited Article for 7th PIC conference entitled, “PIC International proved to be a fantastic success” (<https://angel-tech.net/marketing/2022/mailers/post-show/pic/>)
- 7th July 2022
 - Conference hosted by Angel events together with CS International, and SSI International.
 - Sheraton Airport Hotel, Brussels, Belgium.
- 308) Invited Live TV interview: Benzinga All Access Fireside Chat (Zunaid Suleman show).
- TV interview on 22nd July 2022 with youtube recording: https://www.youtube.com/watch?v=TyKY9R8WT_U
 - Video interview can be found at: <https://www.benzinga.com/markets/emerging-markets/22/07/28231018/lightwave-logic-the-company-with-a-proprietary-solution-to-make-transmitting-data-faster> and the Zunaid Suleman show/background at <https://www.benzinga.com/events/speakers/zunaid-suleman/>
 - Location: Virtually recorded in Washington DC
- 309) Invited Live TV interview with SNN network show Planet MicroCap Podcast and host Robert Kraft: <https://www.youtube.com/watch?v=zCD-hTKtkLg>
- 22nd July 2022
 - Hosted by SNN and Robert Kraft, and video interview can be found at: <https://podcasts.apple.com/us/podcast/lightwave-logic-nasdaq-lwlg-designing-modulators-that/id1024217659?i=1000574742796>
 - Location: Virtually recorded in Washington DC
- 310) Invited Live Radio interview with Bloomberg markets radio show and hosts Paul Sweeney and Matt Miller. Topic, “Lightwave Logic background, radical innovation, business plans, impact on the internet, and where will the industry go in 5years?” Link to radio interview: “[Efficient Data Transmission \(Audio\)](#).”
- 9th August 2022
 - Hosted by Paul Sweeney and Matt Miller at Bloomberg Market Radio show <https://www.bloombergradio.com/shows/bloomberg-markets-am/>

- c. Location: recorded at Lightwave Logic, Englewood, Colorado.
- 311) Invited video interview with Smart Photonics’ “50 Leaders of change” to address where the internet is going from a technology, photonics, and optical networking system perspective. Filmed by London based TBD Media and can be found at: <https://vimeo.com/tbdmediagroup/review/742996199/8dc9821c7a>. with interview at 3:00-50.
 - a. 10th August 2022
 - b. Hosted and videoed by TBD Media hub on [Bloomberg.com](https://www.bloomberg.com)
 - c. Location: Filmed at Lightwave Logic HQ in Englewood, Colorado and released on 9th November 2022.
- 312) Invited talk: Jefferies Semiconductors, IT Hardware & Communications Infrastructure Summit
 - a. 29-31st August 2022
 - b. Hosted by Jefferies Investment Banking
 - c. Sofitel Hotel, Chicago, Illinois
- 313) Invited lecture – TU/e (University of Eindhoven, Netherlands); Electrical Engineering (Photonics); “Polymer Modulators”
 - a. 2nd September 2022
 - b. Hosted by Photonics Integrated Circuits team, Electrical Engineering, TU/e
 - c. TU/e (Eindhoven University), Eindhoven, Netherlands
- 314) Invited review PhD thesis and defense that included review of thesis, public questions for the candidate and ceremonial procession. Amir Abbas Kashi’s thesis is entitled, “Electro-optic slot waveguide phase modulators on the InP membrane on silicon platform”
 - a. 2nd September 2022
 - b. Hosted by TU/e Electrical Engineering, integrated photonics department with co-reviewers including: Prof. J. Leuthold, Prof. K. Williams, and Prof Van der tol.
 - c. TU/e (Eindhoven University), Eindhoven, Netherlands
- 315) Invited keynote talk as part of the ‘New Materials in PICs’ at “EPIC meeting on CMOS compatible integrated photonics at IMEC.” With link to website: <https://epic-assoc.com/events/epic-meeting-on-cmos-compatible-integrated-photonics-at-imec/>
 - a. 7-8th September 2022 with the talk on the 8th September 2022
 - b. Hosted by IMEC and EPIC photonics association. With EPIC photonics at: <https://epic-assoc.com>
 - c. Location at Leuven, Belgium at IMEC 1 foundry.
- 316) Invited speaker: “Status of Lightwave Logic and electro-optic polymers for foundry applications” at the Cleydael Golf Club, Antwerp, Belgium (www.cleydael.be)
 - a. 8th September 2022
 - b. Meeting organized by Belgium and Dutch retail investors of Lightwave Logic Inc. (NASDAQ:LWLG)
 - c. Location: Belgium
- 317) Invited talk at HW Wainwright conference called: ‘H.C. Wainwright 24th Annual Global Investment Conference’, with a talk entitled, “Lightwave Logic Investor

Presentation” and link to website: <https://journey.ct.events/hub/660eb381-b261-4d25-afae-35b654ed04c1> and <https://hcwco.com>

- a. 12 and 13th September 2022 (talk on 13th September 2022)
 - b. Meeting organized by HC Wainwright Investment Banking (<https://hcwco.com>)
 - c. Location: Lotte Palace Hotel, New York City, NY
- 318) Invited interview: Interviewed by Greg Bryan at Telegeography (<https://www2.telegeography.com>) Podcast which can be found at: <https://telegeography.podbean.com/> as well as <https://blog.telegeography.com/simply-illuminating-considering-the-future-of-optical-transport>
- a. 16th September 2022
 - b. Published by Telegeography Podcast and Greg Bryan on 27th September 2022
 - c. Virtual interview
- 319) Invited review article: Subject was for EPIC on their CMOS-foundry workshop : <https://epic-assoc.com/events/epic-meeting-on-cmos-compatible-integrated-photonics-at-imec/>
- a. 13th September 2022
 - b. Published by EPIC photonics association and associated media outlets
 - c. Review written in NYC, 13th September 2022
- 320) Invited article: Ping! Zine technology insights and can be found at: <https://www.pingzine.com/featured-article/the-radical-innovation-of-a-new-polymer-internet/>
- a. 29th September 2022
 - b. Published by Ping! Zine technology insights on 29th September 2022
 - c. Ping! Zine publishes in-depth content through authoritative contribution and thorough interviews with technology subject matter experts across multiple disciplines including cloud, data center, AI, big data, cybersecurity and more.
- 321) Session chairman: ECOC Market Focus technical committee as part of the ECOC Exhibition: sessions included PIC and Silicon Photonics, Optics in Cloud computing, optical transmission (SDN, network agility), Fiber Access, 5G, Cable, PON, FTTX, FTTC, Fiber to the room, new technologies and optical systems, new markets, and new packaging platforms.
- a. 19-21st September 2022
 - b. Committee hosted and organized by ECOC Exhibition
 - c. Market Focus Committee at: : <https://www.ecocexhibition.com/visit/market-focus/>
- 322) Invited video interview: “2022 Market Focus impact for ECOC 2022, Basel, Switzerland,” as Chairman of ECOC 2022 Market Focus Technical Committee at the conference by ECOC TV <https://youtu.be/X8iQoB4vqaA>
- a. 20th September 2022
 - b. Market Focus Exhibition for ECOC 2022,
 - c. Hosted by ECOC exhibition: <https://www.ecocexhibition.com/visit/market-focus/>
- 323) Invited talk and abstract: “Utilizing foundries to scale hybrid electro-optic polymer modulators” with Dr. John Zyskind, VP Engineering, Lightwave Logic

- Inc: <https://www.ecocexhibition.com/visit/market-focus/components-ics-pics-fiber/>
- a. 19th September 2022
 - b. Market Focus Session, PIC components
<https://www.ecocexhibition.com/visit/market-focus/market-focus-timetable-2022/>
 - c. ECOC 2022, Basel, Switzerland
- 324) Interview, industry award chairman, and award presentation to Market Focus Industry Award winners: ECOC exhibition industry awards (in conjunction with optical connections magazine) <https://www.ecocexhibition.com/visit/ecoc-exhibition-industry-awards/> :
- a. 20th September 2022
 - b. Product Focus session, ECOC Exhibition Industry Award Winner Announcement
 - c. ECOC 2022, Basel, Switzerland
- 325) Market Focus Interview: ECOC TV on behalf of Lightwave Logic in the optical integration category by ECOC TV and can be found at: <https://youtu.be/nRd3dYCozUM>
- a. 21st September 2022
 - b. Market Focus Session, PIC components
<https://www.ecocexhibition.com/visit/market-focus/market-focus-timetable-2022/>
 - c. ECOC 2022, Basel, Switzerland
- 326) Invited talk and panelist for ECOC Rump session, with talk entitled, “Hybrid Integration Roadmap: From pilot production to production in a semiconductor fab” at ECOC technical conference, chaired by Dr Jose Pozo, CTO Optica.
- a. 21st September 2022
 - b. ECOC Rump session
 - c. ECOC 2022, Basel, Switzerland
- 327) Paper (co-author): Post-deadline submission to ECOC 2022 entitled, “[Thermally Stable Silicon-Organic Hybrid \(SOH\) Mach-Zehnder Modulator for 140 GBd PAM4 Transmission With Sub-1 v Drive Signals \(Th3B.2\)](#)” given by Carsten Eschenbaum, *Karlsruhe Inst Tech (KIT)* and SilOriX GmbH.
- a. 22nd September 2022
 - b. ECOC Post Deadline session 1; 13:42 to 13:54pm
https://www.optica.org/events/topical_meetings/ecoc/schedule/?day=Thursday#Th3B.2
 - c. ECOC 2022, Basel, Switzerland
- 328) Cited Acknowledgement for Post Deadline Paper: Post-deadline submission to ECOC 2022 entitled, “[>500 GHz Bandwidth Graphene Photodetector Enabling Highest-Capacity Plasmonic-to-Plasmonic Links \(Th3B.5\)](#)” given by Stefan Koepfli, *Eidgenossische Technische Hochschule (ETH) Zurich*.
- a. 22nd September 2022
 - b. ECOC Post Deadline session 1; 14:18 to 14:30pm
https://www.optica.org/events/topical_meetings/ecoc/schedule/?day=Thursday#Th3B.5

- c. ECOC 2022, Basel, Switzerland
- 329) Invited presentation: Diamond Equity Research's annual Spotlight Emerging Growth Invitational Virtual Investor Conference, with a presentation entitled, "Lightwave Logic Investor Presentation" and can be found at https://us02web.zoom.us/webinar/register/WN_2aoRT-XPSZiCFd1cLkVrXA and <https://finance.yahoo.com/news/diamond-equity-research-host-spotlight-113000297.html>
 - a. 4th October 2022 (10:20-10:50am East coast time)
 - b. Diamond Equity Research's Spotlight Emerging Growth Invitational Virtual Investor Conference, conferences@diamondequityresearch.com
 - c. Recorded 30th September 2022 virtually at LWLG.
- 330) Project advisor and panelist: European Commission PhotonHub EU project number/grant agreement 101016665 for 1st review meeting (virtual). Project call [DT-ICT-04-2020 - Photonics Innovation Hubs](#)
 - a. 6th October 2022
 - b. European Commission: <https://www.photonhub.eu> and <https://cordis.europa.eu/project/id/101016665>
 - c. PhotonHub: PhotonHub Europe is a unique European full-service one-stop-shop Photonics Innovation Hub to advance EU competitiveness.
- 331) Invited interview: Interviewed by Cory Johnson at The Drill Down podcast (<https://twitter.com/drilldownpod?lang=en>) Podcast which can be found at: <https://www.iheart.com/podcast/269-the-drill-down-81530167/> as well as <https://twitter.com/DrillDownPod/status/1449964020522360836>
 - a. 7th October 2022
 - b. Published by The Drill Down Podcast and Cory Johnson on 17th October 2022
 - c. Virtual interview
- 332) Invited oral presentation: LD Micro Main Event XV conference with presentation entitled, "Lightwave Logic Update"
 - a. 25th October 2022
 - b. Oral presentation details can be found at: https://www.meetmax.com/sched/event_86249/conference_home.html as well as https://www.meetmax.com/sched/event_86249/conference_presentations.html?bank_access=0&event_id=86249
 - c. Hosted by LD Micro NASDAQ: SRAX
- 333) Invited video presentation: LD Micro Main Event XV conference, recorded on 25th October 2022
 - a. 25th October 2022
 - b. Presentation at: https://www.meetmax.com/sched/event_86249/conference_presentations.html?bank_access=0&event_id=86249
 - c. Hosted by LD Micro NASDAQ: SRAX at the Luxe Sunset Boulevard Hotel LA 24-26th October 2022

- 334) Invited closing comments: Optica Co-packaged and pluggable optics industry summit. Comments were on pluggables vs co-packaged integrated photonics solutions, roadmapping, and transceiver trends on data rate and low power consumption.
- 25th and 26th October 2022
 - Details on the event can be found at: https://www.optica.org/en-us/events/industry_events/2022_optica_industry_summit/
 - Hosted by Optica (formally OSA) <https://www.optica.org/en-us/home/> at Du Pont's innovation laboratories Sunnyvale, CA.
- 335) Invited speaker: Photonics Spectra Annual Conference with presentation entitled, "How electro-optic polymers boost PIC speed and power efficiency".
- Recorded on 28th October 2022, for 9-11th January 2023
 - Details on the event can be found at: <https://www.photonics.com/Advertise/MarketingBlog.aspx?AID=68312>
 - Hosted by Photonics Spectra (www.photonics.com)
- 336) Invited talk at the Board meeting of Optica's Corporate Engagement Council. Presentation on focusing to increase industrial membership, improve marketing, optimize conferences and workshops for the industrial photonics community globally. (https://www.optica.org/en-us/about/leadership_and_volunteers/councils/councils/)
- 1st November 2022,
 - CEC listing: https://www.optica.org/en-us/about/leadership_and_volunteers/councils/councils/#Industry
 - Optica (Optical Society of America – previous name)
- 337) Invited interview with Laser Focus editor Peter Fretty, Editor in Chief of [LASER FOCUS WORLD](#), on the subject of Lightwave Logic, and the radical innovation needed by the optical network and internet.
- 3rd November 2022,
 - Laser Focus world can be found at: <https://www.laserfocusworld.com> and the magazine at: <https://www.laserfocusworld.com/magazine>
 - Laser Focus World
- 338) Invited panel moderator at PIC Summit Conference, Eindhoven, Netherlands in conjunction with IPSR-I workshops. Panel entitled, "Heterogeneous Intergration: Electronics and Photonics united" with companies that included: IMEC, LionX, VTT, Ligentec, Corning, Smart Photonics, Fraunhofer HHI
- 7th November 2022
 - PIC Summit Europe conference. <https://www.picsummiteurope.com/program/>
 - Located at the High Tech Center, Eindhoven, Netherlands
- 339) Invited speaker at PIC Summit Conference, Eindhoven, Netherlands in conjunction with IPSR conference to summarize panel findings and discussion with audience.
- 7th November 2022
 - PIC Summit Europe conference. <https://www.picsummiteurope.com/program/>
 - Located at the High Tech Center, Eindhoven, Netherlands

- 340) Invited Speaker and chair of datacom group at the PIC Summit Europe Conference and IPSR-I workshops with sessions entitled, ‘Paving the way to killer applications in 2035.’ located at TU/e Eindhoven University, Netherlands. Workshop 1c: Datacom roadmap for 2023.
- 8th November 2022
 - PIC Summit Europe conference and IPSR-I roadmap workshops.
<https://www.picsummiteurope.com/program/>
 - Located at the TU/e Eindhoven University, Netherlands.
- 341) Invited talk: IEEE IPC (Integrated Photonics Conference) <https://ieee-ipc.org/industry-day/> as part of the conference <https://ieee-ipc.org> in the session Industry Day-Hot topics in industry. Talk entitled: “Enabling More Efficient Optical Networking using Ultra-high Speed, Ultra-low Power, Ultra-small Foundry based Polymer Modulators”
- 14th November 2022
 - IEEE IPC IEEE IPC (Integrated Photonics Conference) <https://ieee-ipc.org>
 - Located at the Hyatt Regency, Vancouver, BC, Canada.
- 342) Invited talk and panelist: IEEE IPC (Integrated Photonics Conference) <https://ieee-ipc.org/industry-day/> as part of the conference <https://ieee-ipc.org> in the session Roundtable on Topics in Entrepreneurship. Talk entitled: “Entrepreneur or Intrapreneur” with company CEOs that included: OEwaves, Polariton, Freedom Photonics/Luminar, Aeponyx, Octane Wireless.
- 14th November 2022
 - IEEE IPC IEEE IPC (Integrated Photonics Conference) <https://ieee-ipc.org>
 - Located at the Hyatt Regency, Vancouver, BC, Canada.
- 343) Invited Video presentation: Ladenburg Thalmann Virtual Technology Expo conference 2022 entitled “Investor Presentation for Ladenburg Thalmann virtual Technology Expo Investor Presentation”
- Video-taped on 29th November 2022 for release on 7th December 2022
 - For virtual attendees at the Thalmann Virtual Technology Expo conference 2022.
 - Invited video presentation for virtual audience at 2022 Ladenburg Thalmann Virtual Technology Expo: <https://ladenburgtech22.sequireevents.com/>
 - Presentation can be found at: <https://ladenburgtech22.sequireevents.com/>
- 344) Invited panelist: Photonics Spectra panel (virtual and recorded) titled, “Scaling PIC-based applications to volume production.” Panelists included representatives from Sicoya, Polariton, and Ligentec, and hosted by Dr. Jose Pozo, CTO Optica.
- Recorded on 6th December 2022, for release 9-11th January 2023
(<https://events.photonics.com/Event.aspx?EID=9&OC=EM>)
 - Details on the event can be found at:
<https://www.photonics.com/Advertise/MarketingBlog.aspx?AID=68312>
 - Hosted by Photonics Spectra (www.photonics.com)
- 345) Invited speaker at PhotonDelta’s Delta Dialogues virtual interview entitled, “Heterogeneous Integration for PICs” on the summary and findings of PIC Summit

Europe conference on Heterogeneous Integration that took place in November 2022. The session was chaired by Jorn Smeets, PhotonDelta.

- a. 7th December, 2022
 - b. Details of the event can be found at www.photondelta.com and <https://www.photondelta.com/events/> and <https://www.photondelta.com/events/delta-dialogues-december-2022/>
 - c. Hosted by PhotonDelta www.photondelta.com
- 346) Invited Panelist: Ladenburg Thalmann Virtual Technology Expo conference and presentation can be found at: <https://ladenburgtech22.sequireevents.com/>
- a. 7th December 2022
 - b. For virtual attendees at the Thalmann Virtual Technology Expo conference 2022.
 - c. Invited investor presentation at 2022 Ladenburg Thalmann Virtual Technology Expo: <https://ladenburgtech22.sequireevents.com/>
- 347) Invited Webinar and panelist: Roth Capital Partners at the 11th Annual Roth Deer Valley Conference, (<https://www.roth.com/Page/Corporate-Access-Past-Conferences>) with Lightwave Logic investor presentation and meetings.
- a. 14-16th December 2022
 - b. 11th Annual Roth Deer Valley Conference
 - c. Financial investment conference for public company review. Panelist for answering questions by bankers, investment specialists, and fund managers on Lightwave Logic and its business plans, technology and plans for the future.
- 348) Invited reviewer for European Commission program as part of the IPCEI (Important Project of Common European Interest) program on electronics and photonics.
- a. Duration of review process Jun 2022 to Dec 2022
 - b. IPCEI (Important Project of Common European Interest) based on public funding.
 - c. IPCEIs are projects by the EU commission that have the potential to make important contributions to sustainable economic growth, jobs, competitiveness and resilience for industry and the economy in the Union as well as strengthen its open strategic autonomy, by enabling breakthrough innovation and infrastructure projects through cross-border cooperation and with positive spill-over effects on the internal market and the society as a whole. In particular, semiconductor power FETs, laser diodes, amplifiers, FET technologies using both compound semiconductors (GaAs, GaN, InP) as well as silicon semiconductors (Silicon, SiGe) were reviewed.

2023

- 349) Reviewer: (European Commission) for project InSiDe
- a. 24th Jan 2023
 - b. Located at IMEC Ghent University facility, Ghent, Belgium
 - c. InSiDe is an EU project for PIC based technology in the medical field to monitor blood flow and artery stiffness in the human body using long wavelength lasers

- and silicon photonics. Hospital clinical trials will be conducted. It is a follow-on with more clinical trials from an initial CARDIS EU project.
- d. <http://www.inside-h2020.eu>
- 350) Invited speaker and panelist for Laser Focus World Executive Forum (<https://www.laserfocusworld.com/executive-forum>) in San Francisco with talk entitled, “Hybrid integration with electro-optic polymers” and panel session entitled, “Enabling silicon photonics success”
- a. 30th January 2023
 - b. Details of the event can be found at <https://www.laserfocusworld.com/executive-forum> and agenda at <https://www.lfwexecutiveforum.com>
 - c. Panelists included: Jose Pozo, CTO Optica, David Piehler, Dell Technologies, Peter Winzer, Nubis Communications, Robert Blum, Intel
- 351) Interview with Benjamin Glick of Mergermarket magazine entitled, “Lightwave could acquire more assets ahead of commercialization—CEO”
- a. 3rd February 2023
 - b. Details of the interview can be found at: <https://community.ionanalytics.com/lightwave-could-acquire-more-assets-ahead-of-commercialization-ceo>
 - c. Video interview remotely from Lightwave Logic HQ in Englewood, Colorado.
- 352) Interview and podcast with Don Witt of Telecom Reseller’s Channel Daily News for a podcast on Lightwave Logic: Background, radical innovation, technology, acquisitions, world record results, goals, and the future of optical networking in a decade. Podcast can be found at <https://telecomreseller.com/2023/02/14/lightwave-logic-technology-enables-the-existing-fiber-internet-infrastructure-to-perform-3-times-faster-than-current-speeds-podcast/>
- a. 8th February 2023 (interview) and published 14th February 2023
 - b. Details can be found at: <https://telecomreseller.com/category/channel-daily-news/>
 - c. Podcast is with Telecom Reseller which provides information on voice mail, audio/video conferencing and peripherals, association and industry news, services, applications, and related topics of daily importance to telecommunications professionals.
- 353) Invited Article entitled: “The Internet Is the Brick Wall Nostradamus Didn’t See Coming” with sub-heading, “The road maps Lightwave Logic is creating for the future of photonics will guide people toward the focus areas and the technology challenges they can expect as performance demands increase.” For the industry trends section of BBC magazine (Broadband Communities) at (<https://www.bbcmag.com>)
- a. Published in Broadband Communities 14th February 2023.
 - b. Article can be found at: https://www.bbcmag.com/pub/doc/BBC_Jan23_BrickWall.pdf
- 354) Interview with AlphaStreet entitled, “Lightwave Logic will license technology to make its polymers ubiquitous: CEO Dr. Michael Lebby” Interview can be found at

<https://news.alphastreet.com/lightwave-logic-will-license-technology-to-make-its-polymers-ubiquitous-ceo-dr-michael-lebby/>

- a. 6th March 2023 (interview) and published 10th March 2023
 - b. Details can be found at: <https://news.alphastreet.com/lightwave-logic-will-license-technology-to-make-its-polymers-ubiquitous-ceo-dr-michael-lebby/>
 - c. Interview is with AlphaStreet which provides financial information on companies and utilize NLP and AI techniques in the research industry.
- 355) Invited speaker: Roth Capital Partners 35th Annual Roth Conference (<https://www.roth.com/Page/Corporate-Access-Past-Conferences>)
- a. 13th Mar 2023
 - b. 35th Annual Roth Conference (www.roth.com/oc2023)
 - c. Financial investment conference for public company review. Panelist for answering questions by bankers, investment specialists, and fund managers on Lightwave Logic and its business plans, technology and plans for the future.
- 356) Interview with Laser Focus by Jose Pozo as part of his Industry Executive interviews for the photonics industry. Key topics included intrapreneur and entrepreneur experience, Lightwave Logic, photonics experience, OIDA, roadmapping, and key drivers for a career in photonics integration Interview can be found at: <https://www.laserfocusworld.com/fiber-optics/article/14293915/how-thinking-ahead-shaped-the-fiberoptics-industry>
- a. 16th March 2023 (interview) and published 17th May 2023
 - b. Details can be found at: <https://www.laserfocusworld.com>
 - c. Interview is with Laser Focus World which was originally published in 1965, as *Laser Focus World*—a monthly magazine for engineers, researchers, scientists, and technical professionals—provides comprehensive global coverage of optoelectronic technologies, applications, and markets. Nearly 70,000 qualified optoelectronics professionals from around the world currently subscribe.
- 357) Interview with IDC by Brandon Hoff on Lightwave Logic, background, radical innovation, proprietary electro-optic polymer technology, goals and why the company is planning on making polymers ubiquitous for the hyper-scaler, datacenter markets.
- a. 16th March 2023 (interview)
 - b. Details can be found at: <https://www.idc.com>
 - c. Interview is with IDC which provides market and financial information on the information technology and optical networking industry.
- 358) Invited article for ISE entitled “ Proactive Powering Problem-Solving with Polymers” <https://www.isemag.com/ftx-optical-networks/article/14290981/proactive-powering-problemsolving-with-polymers>
- a. 16th March 2023
 - b. Details can be found at: <https://www.isemag.com>
 - c. ISE has articles on IT solutions and education.
- 359) Invited article and interview (from panel discussion) at Laser Focus World Executive Forum (<https://www.laserfocusworld.com/executive-forum>) in San Francisco with article entitled, “Silicon photonics: Is it witchcraft?”

<https://www.laserfocusworld.com/executive-forum/article/14290913/silicon-photonics-is-it-witchcraft>

- a. 17th March 2023
 - b. Details of the event can be found at <https://www.laserfocusworld.com/executive-forum> and agenda at <https://www.lfwexecutiveforum.com>, and article at: <https://www.laserfocusworld.com/executive-forum/article/14290913/silicon-photonics-is-it-witchcraft>, written by Sally Cole Johnson for Laser Focus.
 - c. Panelists included: Jose Pozo, CTO Optica, David Piehler, Dell Technologies, Peter Winzer, Nubis Communications, Robert Blum, Intel
- 360) Invited article for IMS expert insights entitled, “An Expert Witness Perspective on Inter Partes Review of Patents” by Dr. Michael Lebby, IMS Elite Expert, <https://www.expertservices.com/insight/expert-witness-ipr-patents/>
- a. 12th April 2023
 - b. Details can be found at <https://www.expertservices.com>
 - c. Patent litigation cases can be won or lost through the actions and competency of an expert witness—making their role not only important but crucial. The article takes a closer look at the part an expert witness plays during the *inter partes* review and considers how the IPR process could be improved.
- 361) Invited interview with Semiconductor Engineering by Karen Heyman, in an article called <https://semiengineering.com/transitioning-to-photonics/> entitled, “Transitioning to Photonics”
- a. Interview taken on 4th April 2023 and published online 14th April 2023
 - b. Details can be found at: <https://semiengineering.com/about-us/>
 - c. The article is based on the premise that high speed and low heat make photonics technology essential, especially compared to electronics, but it’s extremely complex, and talent is hard to find and train.
- 362) Session Co-chairman: 8th PIC International conference, www.picinternational.net
- a. 17-18th April 2023 for 2 days of PIC sessions.
 - b. Conference hosted by Angel events together with CS International and Power Electronics International conferences.
 - c. Sheraton Airport Hotel, Brussels, Belgium.
- 363) Chair Panel session: For the panel entitled, “Foundry models for PICs” of 8th PIC International conference, www.picinternational.net and moderated by Jose Pozo, CTO Optica. Panel members included Global Foundries, Tower, VTT
- a. 17th April 2022
 - b. Conference hosted by Angel events together with CS International, and Power Electronics International conferences.
 - c. Sheraton Airport Hotel, Brussels, Belgium.
- 364) Invited speaker and oral presentation: With presentation entitled, “Positioning electro-optic polymer modulators as an optical engine to extend data rate and low power performance for optical networking” at the 8th PIC International conference, www.picinternational.net in the day 2 session, “Scaling PICs in volume using foundries”
- a. 18th April 2023

- b. Conference hosted by Angel events together with CS International, and Power Electronics International conferences.
 - c. Sheraton Airport Hotel, Brussels, Belgium.
- 365) Invited speaker: “Status of Lightwave Logic and electro-optic polymers” at the Cleydael Golf Club, Antwerp, Belgium (www.cleydael.be)
- a. 18th April 2023
 - b. Meeting organized by Belgium and Dutch retail investors of Lightwave Logic Inc. (NASDAQ:LWLG)
 - c. Location: Belgium
- 366) Invited interview with Semiconductor Engineering by Karen Heyman, in an article called <https://semiengineering.com/new-standards-push-co-packaged-optics/> entitled, “New standard push co-packaged optics”
- a. Interview taken on 4th April 2023 and published online 26th April 2023
 - b. Details can be found at: <https://semiengineering.com/about-us/>
 - c. The article is based on the premise that co-packaged optics (CPOs) promises five times the bandwidth of pluggable connections, however, the new architecture requires multiple changes to accommodate different applications, and if the design is efficient the optical engines will be able to impact both on-board optics as well as pluggable transceivers.
- 367) Invited speaker and oral presentation for the Sequire Investor Summit, San Juan, Puerto Rico. The presentation was entitled, “LWLG April 2023 investor presentation” with link <https://puertorico.srax.com> with agenda: <https://schedule.puertorico.srax.com>
- a. Conference on 25th and 26th April 2023 with presentation on 25th April 2023
 - b. Link to website for Sequire event: <https://puertorico.srax.com>
 - c. Investor conference at the La Concha hotel San Juan, Puerto Rico.
- 368) Invited speaker and oral presentation: Ladenburg Thalmann Technology Expo and conference 2023. The presentation was entitled, “LWLG April 2023 investor presentation” and can be found at: https://www.meetmax.com/sched/event_94169/_co-list_cp.html
- a. 27th April 2023
 - b. The conference and expo 2023, was held at Convene Hotel, Park and 41st, New York, New York and can be found at: https://www.meetmax.com/sched/event_94169/_co-list_cp.html and also at <https://www.ladenburg.com/investment-banking/ladenburg-thalmann-co-inc->
 - c. The 2023 Expo featured presentations from the managements of approximately 50-60 public and private technology companies covering Media and Content-Tech, Software and Service-Tech, and Hardware and Defend-Tech.
- 369) Invited article: 8th PIC International conference overview entitled, “An overview of Angeltech 2023 (PIC international conference)”, which can be found at www.picinternational.net with newsletters@angelmail.co.uk
- a. 2nd May 2023

- b. Overview is based on the results of the PIC International Conference hosted by Angel events (17-18th April 2023) together with CS International and Power Electronics International conferences.
- c. Sheraton Airport Hotel, Brussels, Belgium.
- 370) Invited speaker to chair Lightwave Logic Inc's Annual Shareholder Meeting (ASM) at the Inverness Hilton, Englewood, Colorado.
 - a. 25th May 2023
 - b. Lightwave logic Inc., Denver, Colorado.
 - c. Read script, chair voting procedures for Lightwave Logic Annual shareholder meeting for Lightwave Logic Inc.
- 371) Invited speaker for management/CEO presentation for Lightwave Logic Inc., at the Annual Shareholder Meeting (ASM) at the Inverness Hilton, Englewood, Colorado
 - a. 25th May 2023
 - b. Lightwave logic Inc., Denver, Colorado.
 - c. Annual shareholder meeting for Lightwave Logic Inc., with live presentation with live Q&A from investors.
- 372) Reviewer: European Commission HORIZON-CL4-2022-DIGITAL-EMERGING-Human-01-57 (Digital and emerging technologies for competitiveness and fit for the Green Deal), Horizon IA: Towards next generation of cost-effective multi and hyper spectral remote sensing systems, and applications to health, automotive, and waster sorting.
 - a. 10-26th May 2023
 - b. European Commission: Reviewing submitted technical photonics proposals for Horizon 2023 evaluation calls and rate proposals to EU guidelines.
 - c. IA: <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020>
- 373) Invited keynote speaker at Safecapital investor conference in Ghent with talk entitled, "Commercializing electro-optic polymers" hosted by Brecht Arnaert, Chief Editor www.safecapital.eu with Safecapital Lente meeting, Vander Valk Hotel, Ghent.
 - a. 27th May 2023
 - b. Vander Valk Hotel, Ghent, Belgium
 - c. Safecapital organized a retail investor event with an invite for Lightwave Logic to present and network with investors: <https://tixoom.app/brechtarnaert/ur0v1eff>
- 374) Invited interview with Stephen Hardy of Lightwave Online (www.lightwaveonline.com) with discussion entitled, "Lightwave Logic reaches electro-optic polymer materials commercialization with supply license agreement" and can be found at: https://www.lightwaveonline.com/optical-tech/components/article/14294661/lightwave-logic-reaches-electrooptic-polymer-materials-commercialization-with-supply-license-agreement?utm_source=LW+Friday+5&utm_medium=email&utm_campaign=CPS230602105&o_eid=9764C7112945F2S&rdx.ident%5Bpull%5D=omeda%7C9764C7112945F2S&oly_enc_id=9764C7112945F2S
 - a. Interview conducted on 30th May 2023, and published at www.lightwaveonline.com on 1st June in Stephen Hardy's Friday 5.
 - b. Article published at <https://www.lightwaveonline.com>

- c. Lightwave online reports on activity in the fiber optics lightwave communications industry at <https://www.lightwaveonline.com>
- 375) Invited Live TV interview: Benzinga (Spencer Israel show).
 - a. TV interview on 9th June 2023 with youtube recording: <https://www.youtube.com/watch?v=jFiB9P3voUk>
 - b. Presentation can be found at: <https://www.youtube.com/watch?v=jFiB9P3voUk> and the Spencer Israel show/background at <https://www.linkedin.com/in/spencer-israel-44b02b31/> and <https://www.benzinga.com/author/spencer-israel/>
- 376) Project advisor and panelist: European Commission HORIZON-CL4-2021-DIGITAL-EMERGING-01-07 LOLIPOP EU project number 101070441
 - a. 21st June 2023
 - b. European Commission
 - c. <https://horizon-de-lolipop.eu>
 - d. LOLIPOP: Lithium NiObate empowered siLIcon nitride Platform for fragmentation free OPeration in the visible and the NIR. Material technology includes LNOI (lithium niobate on insulator) and TFLN (thin film lithium niobate).
- 377) Contributing author: Heterogeneous Integration Roadmap (2023 edition), Chapter 17 Test Technology which can be found at: https://eps.ieee.org/images/files/HIR_2023/ch17_test.pdf
 - a. 9th August 2023
 - b. <https://eps.ieee.org/technology/heterogeneous-integration-roadmap.html>
 - c. Overview of the roadmap: The ITRS Assembly and Packaging Working Group has had many years of history of collaboration with the IEEE Societies in holding workshops and work sessions at IEEE Societies sponsored conferences and events around the world. The basis of this collaboration is the common shared interest in a Technology Roadmap for the IEEE Societies' membership, conference attendees and participants in the ITRS Technical Working Group work sessions. IEEE Societies Conferences are high profile forums on the latest research and development in Packaging, Interconnect, Test and the materials, processes and equipment supporting this R&D. The Roadmap workshops of the ITRS had provided an opportunity for the participants to review the directions of these technologies and build a technology Roadmap looking 15 years into the future.
- 378) Invited interview with the publication TWST (The Wall Street Transcript) and Erik Sherman, a reporter at (www.twst.com). The interview entitled "Interview with the Chairperson and CEO: Lightwave Logic Inc. (NASDAQ:LWLG)"
 - a. Interview taken on 42nd August 2023 and published online 17th August 2023
 - b. Details can be found at: (www.twst.com) and <https://www.twst.com/interview/interview-with-the-chairperson-and-ceo-lightwave-logic-inc-nasdaqlwlg>
 - c. The Wall Street Transcript is a subscriber-based online and print publication for retail and institutional investors. For more than 50 years, it has published

- thousands of in-depth interviews with CEOs, industry analysts and professional money managers. The article is about Lightwave Logic and their market positioning for electro-optic polymer modulators in fiber optic communications.
- 379) Invited Live TV interview with Planet MicroCap Podcast and host Robert Kraft <https://planetmicrocapshowcase.com> as Chairman and CEO of Lightwave Logic Inc.
- Recorded 23rd August 2023 and went live at the conference 6th September 2023.
 - Hosted by Robert Kraft with video interview can be found at the website <https://planetmicrocapshowcase.com>
 - Location: Virtually recorded in Washington DC
- 380) Invited presentation entitled, “commercializing electro-optic polymers” with Q&A by host Robert Kraft for Vancouver conference by Planet MicroCap <https://planetmicrocapshowcase.com>
- 23rd August 2023 with presentation conveyed on 6th and 7th September 2023
 - Hosted by Robert Kraft with video Q&A that can be found at the website <https://planetmicrocapshowcase.com> and <https://planetmicrocapshowcase.com/page-1551>
 - Location: Virtually recorded in Washington DC for virtual viewing in Vancouver Canada.
- 381) Invited interview for the Denver Business Journal, reported by Cassidy Ritter. With title of article, “Englewood tech company making the internet faster expands lab to scale commercial arm: The CEO said high speed and low power are the internet’s Achilles heels, but that his company’s technology can address those concerns.”
- 8th September 2023
 - Web link: <https://www.bizjournals.com/denver/news/2023/09/08/lightwave-logic-expands-lab-commercial-arm.html>
 - The Denver Business Journal reports on business activities in the Denver tech center region. <https://www.bizjournals.com/denver/> Interview location at Lightwave Logic Headquarters in Englewood, Colorado.
- 382) Invited talk at HC Wainwright conference called: ‘H.C. Wainwright 25th Annual Global Investment Conference’, with a talk entitled, “Making the internet faster and more efficient” and link to website: <https://journey.ct.events/hub/37dab2e5-2e54-48d4-9288-d6a3d11a986c> and <https://hcwco.com>
- 11 and 12th September 2023 (talk on 11th September 2023)
 - Meeting organized by HC Wainwright Investment Banking (<https://hcwco.com> and <https://journey.ct.events/vpages/37dab2e5-2e54-48d4-9288-d6a3d11a986c/ae480130-ce5f-4513-9cd1-81afdb08853a>). Location: Lotte Palace Hotel, New York City, NY
- 383) Invited article for Techradar: The Business Technology Experts (www.techradar.com) entitled: “Artificial intelligence is a very real data center problem”
- Published 18th September 2023
 - Web link: <https://www.techradar.com/pro/artificial-intelligence-is-a-very-real-data-center-problem>
 - The techradar pro (<https://www.techradar.com/pro>)

- 384) Chair of technical committee for ECOC exhibit's Market Focus sessions at ECOC 2023, at the SECC conference center, Glasgow, Scotland.
- 2nd – 4th October 2023
 - Six Market Focus sessions and two panels were organized for ECOC Market Focus 2023 with sessions in broadband access, datacentres, service provider optical transmission, network agility/SDN, photonics integration, new component technologies and packet optical transport. ECOC exhibit organized by Nexus Business Media Ltd.
 - <https://www.ecocexhibition.com/ecoc-exhibition-2022/> and highlights including photographs at: <https://www.ecocexhibition.com/home/2023-highlights/>
- 385) Session Chair for two sessions at ECOC's Market Focus session 1 and session 2 on modules/sub-systems.
- 2nd October 2023
 - These two sessions (am and pm) attracted up to 400 attendees in various talks, and focused on optical pluggable modules and transceivers, and their associated line cards, switches, routers and sub-system optical networking equipment.
 - The sessions can be found at: <https://www.ecocexhibition.com/visit/market-focus/market-focus-2023-timetable/> The Market Focus sessions were held at the SECC conference center, Glasgow, Scotland.
- 386) Awards committee chairman, Market Focus, ECOC exhibit, 2023. With role to present 9 awards to winners of industrial product-based technologies in optical communications.
- 3rd October 2023
 - The Market Focus awards <https://www.ecocexhibition.com/home/2023-highlights/> is a competition that is run by the technical committee with submissions from various industrial companies globally.
 - The awards were presented to winners at the Product Focus auditorium to 9 winners on 3rd October 2023 (<https://www.ecocexhibition.com/industry-awards/>) at ECOC's exhibit, SECC conference center, Glasgow, Scotland.
- 387) Selected talk and speaker at ECOC's Market Focus session on modules/sub-systems. Talk was entitled, "Commercializing reliable hybrid electro-optic polymer modulators" and can be found at: <https://www.ecocexhibition.com/visit/market-focus/>
- 2nd October 2023
 - Every year the Market Focus is the key place to get up-to-date knowledge from across the industry in key technical areas and discover the latest commercial trends in optical communications. Now in it's 17th year the Market Focus theatre is one of the highlights of the ECOC Exhibition attracting the world's best speakers from the industry globally.
 - Talk can be found from the Market Focus session talks at: <https://www.ecocexhibition.com/visit/market-focus/market-focus-2023-timetable/>
- 388) Invited video interview by ECOC TV: "2023 Market Focus review in Glasgow, Scotland" as Chairman of ECOC 2023 Market Focus Technical Committee at the conference.

- a. Recorded 3rd October 2023
 - b. Market Focus Exhibition for ECOC 2023,
 - c. Hosted by ECOC exhibition: <https://www.ecocexhibition.com/visit/market-focus/> and <https://www.ecocexhibition.com/home/2023-highlights/>
- 389) Invited video interview by ECOC TV for industrial award competition opening for 2024's ECOC at Frankfurt, Germany as Chairman of ECOC Market Focus Technical Committee.
- a. Recorded 3rd October 2023
 - b. Market Focus Industrial Awards competition for ECOC 2024.
 - c. Hosted by ECOC exhibition: <https://www.ecocexhibition.com/visit/market-focus/> and <https://www.ecocexhibition.com/home/2023-highlights/>
- 390) Invited video interview by ECOC TV for invited abstracts for 2024's Market Focus technical sessions at ECOC at Frankfurt, Germany as Chairman of ECOC Market Focus Technical Committee.
- a. Recorded 3rd October 2023
 - b. Market Focus invite for abstracts for ECOC 2024.
 - c. Hosted by ECOC exhibition: <https://www.ecocexhibition.com/visit/market-focus/> and <https://www.ecocexhibition.com/home/2023-highlights/>
- 391) Winner: Acceptance of glass trophy for ECOC Industry awards on behalf of Lightwave Logic Inc. in the most innovative hybrid/PIC (photonic integration circuit) integration platform: <https://www.ecocexhibition.com/visit/ecoc-exhibition-industry-awards/>
- a. 3rd October 2023
 - b. Held at the Product Focus session, ECOC Exhibition Industry Award Winner Announcement (<https://www.ecocexhibition.com/home/2023-highlights/>)
 - c. ECOC 2023, Glasgow, Scotland. The award is for the most innovative product platform in hybrid PICs across the industry—what new product is driving change in its respective market segment. What's timely and helping to increase the use of optics. Metrics would include design features that are photonics, electronics, thermal, mechanical, chemical, environmental and carbon footprint based (<https://www.ecocexhibition.com/industry-awards/>).
- 392) Invited video 'Lightwave Logic advancing its silicon photonic prototypes' by Proactive, (<https://www.proactiveinvestors.com>), and is interviewed by Tom Warner with video <https://www.proactiveinvestors.co.uk/companies/news/1028712/lightwave-logic-picks-up-industry-award-for-its-work-in-speeding-up-the-internet-1028712.html>
- a. 4th October 2023
 - b. Proactive video (Wall St) series (<https://youtu.be/amz8jxV9YS4>)
 - c. Lightwave Logic, Inc. (NASDAQ: LWLG) CEO Michael Lebby is interviewed live at ECOC 2023 show floor with a glass trophy in hand from winning the hybrid/PIC integration platform award at Market Focus Awards (<https://www.ecocexhibition.com/industry-awards/>)

- 393) Invited video interview by ECOC TV: “2023 Industry Award Winners ECOC Exhibition, Glasgow, Scotland” as Chairman of ECOC 2023 Market Focus Technical Committee at the conference: https://youtu.be/k_CYdV7CDd0
- Recorded 3rd October 2023 and published 13th October 2023
 - Industry awards interview can be found at: https://youtu.be/k_CYdV7CDd0
 - Hosted by ECOC exhibition: <https://www.ecocexhibition.com/visit/market-focus/> and <https://www.ecocexhibition.com/home/2023-highlights/>
- 394) Invited video interview by ECOC TV: “Winner of Most innovative Product – Hybrid PIC/Optical Integration Platform for Lightwave Logic Inc., <https://youtu.be/KYYQjVHfDq8>
- Recorded 3rd October 2023 and published 13th October 2023
 - Industry winning award interview can be found at: <https://youtu.be/KYYQjVHfDq8>
 - Hosted by ECOC exhibition: <https://www.ecocexhibition.com/visit/market-focus/> and <https://www.ecocexhibition.com/home/2023-highlights/>
 -
- 395) Invited speaker at the Photonics Enabled Cloud Computing (PECC) Summit organized by Optica (https://www.optica.org/events/industry_events/2023/optica_photonic-enabled_cloud_computing_industry_summit_at_juniper_networks/program/) Talk entitled: “Commercializing Electro-Optic Polymers” and was given in the 5th session on Materials and Components to Advance Optical Technologies.
- 24-25th October 2023; talk took place on 25th October 2023
 - Organized by Optica (https://www.optica.org/events/industry_events/2023/optica_photonic-enabled_cloud_computing_industry_summit_at_juniper_networks/)
 - Located at Juniper’s conference facility, Sunnyvale, California.
- 396) Invited co-speaker at PIC Summit Conference, Eindhoven, Netherlands in conjunction with IPSR conference for Polymers
- 8th November 2023
 - PIC Summit Europe conference. <https://www.picsummiteurope.com>
 - Located at the TU/e Eindhoven University, Netherlands.
- 397) Invited co-speaker at PIC Summit Conference, Eindhoven, Netherlands in conjunction with IPSR conference for datacom and telecom
- 8th November 2023
 - PIC Summit Europe conference. . <https://www.picsummiteurope.com>
 - Located at the TU/e Eindhoven University, Netherlands.
- 398) Project advisor and panelist: European Commission HORIZON-CL4-2022-DIGITAL-EMERGING-01-03 CORALIDAR EU project number 101092834 for 1st review meeting (virtual).
- 30th November 2023
 - European Commission: <https://corali-dar.eu>
 - CORA-LIDAR: Collaborative Radio - Light Detection And Ranging

- 399) Invited Live TV interview: Benzinga All Access Fireside Chat (15mins inclusive of Q&A) as part of the Zunaid Suleman show.
- TV interview on 4th December 2023 with youtube recording: https://www.youtube.com/watch?v=CEZ51a_HTpY
 - Video interview can be found at: <https://www.benzinga.com> and https://www.youtube.com/watch?v=CEZ51a_HTpY and the Zunaid Suleman show/background at <https://www.benzinga.com/events/speakers/zunaid-suleman/>
 - Location: Virtually recorded in New York, NY

2024

- 400) Invited speaker and oral presentation for the Sequire Investor Summit, San Juan, Puerto Rico. The presentation was entitled, “LWLG January 2024 investor presentation” with link <https://puertorico.srax.com> with agenda: <https://schedule.puertorico.srax.com>
- Conference on 24th and 26th January 2024 with presentation on 24th January 2024
 - Link to website for Sequire event: <https://puertorico.srax.com>
 - Investor conference at the Conadado Vanderbilt hotel San Juan, Puerto Rico.
- 401) Introducing speaker and moderator for Optica’s VIP executive meeting at MOMA (as part of Photonics West conference in San Francisco, CA). Moderating Alan Lowe through Q&A with an audience of >400.
- 29th Jan 2024
 - Details can be found at www.optica.org
 - Location: Museum of Modern Art, San Francisco,
- 402) Reviewer: (European Commission) for project InSiDe
- 30th Jan 2024
 - Virtual meeting for the consortium.
 - InSiDe is an EU project for PIC based technology in the medical field to monitor blood flow and artery stiffness in the human body using long wavelength lasers and silicon photonics. Hospital clinical trials will be conducted. It is a follow-on with more clinical trials from an initial CARDIS EU project.
 - <http://www.inside-h2020.eu>
- 403) Chair and moderator/host for EPIC Photonics VIP executive reception, located at 1 Hawthorne Street, San Francisco, CA 94105.
- 30th Jan 2024
 - Located at 1 Hawthorne St., San Francisco which attracted over 150 attendees.
 - The EPIC VIP executive reception is the 4th in the series and was organized by EPIC Photonics.
 -
- 404) Interviewer & Chair and moderator for Optica’s VIP executive reception, located in parallel with SPIE’s Photonics West 2024. The role included a speech to introduce Lumentum’s President and CEO Alan Lowe, and to moderate questions and answers (on behalf of having the role of Chair, Corporate Engagement Council, Optica).
- 30th Jan 2024

- b. Located at the auditorium of the San Francisco Museum of Modern Art (SF-MOMA), which attracted a sellout of 500 guests.
 - c. The Optica VIP executive reception is the 2nd in the series, with the first being held in 2023.
- 405) Project advisor and panelist: European Commission HORIZON-EIC-2022-TRANSITION OPEN-01 (ALUVIA) EU project number 101099699 for 1st review meeting (virtual).
- a. 16th February 2024
 - b. European Commission: <https://aluvia-project.eu>
 - c. ALUVIA: Aluminium oxide integrated photonic platform for applications in the ultraviolet (UV)
- 406) Invited and recorded TV interview: Benzinga All Access Fireside Chat (15mins inclusive of Q&A) as part of the Zunaid Suleman show.
- a. Recorded TV interview on 23rd February 2024 for release 1st March 2024
https://www.youtube.com/watch?v=CEZ51a_HTpY
 - b. Video interview can be found at: <https://www.benzinga.com> and https://www.youtube.com/watch?v=CEZ51a_HTpY and the Zunaid Suleman show/background at <https://www.benzinga.com/events/speakers/zunaid-suleman/>
 - c. Location: Virtually recorded in Washington, DC.
- 407) Project advisor and panelist: European Commission Cordis InPULSE (jeppix) EU project number/grant agreement 824980 for 3rd review meeting (virtual).
- a. 14th March 2024
 - b. European Commission: <https://cordis.europa.eu/project/id/824980/reporting> and <https://www.jeppix.eu>
 - c. InPULSE: Establishing a proven European PIC ecosystem by building an open access pilot line as well as InP pilot line for scaled up, self-sustained PIC ecosystem.
- 408) Invited speaker and panelist for OFC workshop entitled “Will Heterogeneous Integration Meet the Needs of Future Applications?” (<https://www.ofcconference.org/en-us/home/program-speakers/workshops/will-heterogeneous-integration-meet-the-needs/>) in OFC 2024, San Diego, California. Presentation was entitled, “Electro-optic polymers for heterogeneous integration.”
- a. 24th March 2024
 - b. Details of the event can be found at <https://www.ofcconference.org/en-us/home/program-speakers/> and agenda at (<https://www.ofcconference.org/en-us/home/program-speakers/workshops/will-heterogeneous-integration-meet-the-needs/>) Panelists included: Wim Bogaerts, *Ghent University, Belgium*, Alex Chikhaoui, *X-Celeprint, Ireland*, Ivan Huang, *Avicena Tech, United States*, Sylvie Menezo, *Scintil, France*, Edward Preisler, *Tower Semiconductor, United States*, Mian Zhang, *Hyperlight, United States*
 - c. Location: Live at San Diego conference center, San Diego, California
- 409) Invited moderator for Optica’s Executive forum CEO panel at OFC 2024 in San Diego, California,

- (https://www.optica.org/events/industry_events/2024/optica_executive_forum_at_ofc_2024/program/). The CEO panel consisted of: [David Heard](#) CEO, Infinera, [Alan Lowe](#) CEO, Lumentum, [Chuck Mattering](#) CEO, Coherent, [Bill Brennan](#) CEO, Credo
- a. 25th March 2024
 - b. Details of the Executive Forum can be found at:
https://www.optica.org/events/industry_events/2024/optica_executive_forum_at_ofc_2024/ located at the Hilton Bayfront, San Diego, California
- 410) Invited video “Lightwave Logic Demonstrates World-Class 200Gbps Heterogeneous Polymer/Silicon Photonic Modulator Results through Extending Silicon Photonics Performance using its Proprietary Perkinamine® Electro-Optic Materials Based on 200mm Commercial Wafers at the 2024 Optical Fiber Conference in San Diego” by Proactive, (<https://www.proactiveinvestors.com>), and is interviewed by Steve Darling with link: [Lightwave Logic Leads the Way in Electro-Optic Polymer Technology for Enhanced Data Transmission](#)
- a. 4th April 2024 (published 11:21am)
 - b. Proactive video (Wall St) series
(<https://www.proactiveinvestors.com/NASDAQ:LWLG/Lightwave-Logic-Inc>)
 - c. Lightwave Logic, Inc. (NASDAQ: LWLG) Chairman and CEO Michael Lebby is interviewed after OFC2024.
- 411) Invited speaker: LD Micro Invitational XIV conference at Sofitel Hotel New York, NY with presentation entitled, “Lightwave Logic status and update” <https://ldinv14.sequireevents.com/> and https://www.meetmax.com/sched/event_103991/investor_welcome.html
- a. 8th and 9th April 2024 with oral presentation on 9th April 2024
 - b. Presentation at <https://api.mziq.com/mzfilemanager/v2/d/307dbc8b-e212-48ba-9968-8cef3f6b5188/683426d1-5a08-bc3a-6df3-ce127bd5ef17?origin=2>
 - c. Hosted by LD Micro NASDAQ: SRAX with URL: <http://www.ldmicro.com>
- 412) Project advisor and panelist: European Commission PhotonHub EU project number/grant agreement 101016665 for 2nd review meeting (virtual). Project call [DT-ICT-04-2020 - Photonics Innovation Hubs](#)
- a. 11th and 12th April 2024
 - b. European Commission: <https://www.photonhub.eu> and <https://cordis.europa.eu/project/id/101016665>
 - c. PhotonHub: PhotonHub Europe is a unique European full-service one-stop-shop Photonics Innovation Hub to advance EU competitiveness.
- 413) Invited Chair and conference moderator for the 1st and inaugural ESS (Executive Strategy Summit) – a global perspective that includes electronics, semiconductors, photonics, sensing with focus a) economic trends and market drivers, b) funding opportunities, c) intellectual property, patents, mergers and acquisitions. <https://angel-tech.net/executivestrategysummit/agenda>
- a. 15th April 2024
 - b. Brussels, Belgium

- c. <https://angel-tech.net/executivestrategysummit> The conference will delve into key topics such as emerging economic trends, disruptive technologies, market forecasts, and funding strategies. By exploring these areas, attendees will gain a deeper understanding of the market landscape and the implications for their business strategies. Moreover, they will gain valuable insights into how to navigate the complex funding landscape and capitalize on growth opportunities in the CS, PIC and PE industries.
- 414) Invited panel speaker for PIC (PIC International Conference) panel entitled, “Advancing the frontier of photonic integration: challenges and innovations in PIC packaging” with panel members from PHIX, LWLG, Tyndall National Institute (PIXAPP), POET Technologies. <https://picinternational.net/agenda>
 - a. 16th April 2024
 - b. Brussels, Belgium
 - c. <https://picinternational.net> The 9th PIC International conference aims to connect, educate, and inspire the photonic integrated circuit (PIC) industry. With presentations covering seven sectors, attendees will gain insights into topics like Hybrid PICs: Pioneering New Frontiers in Photonic Integration; PIC Packaging: Securing Optimal Integration and Performance; Quantum Era: Unleashing PICs' Boundless Potential; Rapid Scaling: Foundries Fuelling PICs' Mass Production; Accelerating PIC Adoption in Established Markets; PIC Size and Simulation: Enhancing Design Efficiency, and Power Efficiency: Minimizing Consumption in PICs.
- 415) Invited conference co-chair (with David Cheskis) for 9th PIC (PIC International Conference) <https://picinternational.net/agenda>
 - a. 16th and 17th April 2024
 - b. Brussels, Belgium
 - c. <https://picinternational.net> The 9th PIC International conference aims to connect, educate, and inspire the photonic integrated circuit (PIC) industry. With presentations covering seven sectors, attendees will gain insights into topics like Hybrid PICs: Pioneering New Frontiers in Photonic Integration; PIC Packaging: Securing Optimal Integration and Performance; Quantum Era: Unleashing PICs' Boundless Potential; Rapid Scaling: Foundries Fuelling PICs' Mass Production; Accelerating PIC Adoption in Established Markets; PIC Size and Simulation: Enhancing Design Efficiency, and Power Efficiency: Minimizing Consumption in PICs.
- 416) Invited speaker for 9th PIC International Conference with talk entitled, “High speed, low power, tiny modulators in a polymer PIC platform are poised to enable 800G/1.6Tbps data communications, driven in part by artificial intelligence.”
<https://picinternational.net/agenda>
 - a. 16th April 2024
 - b. Brussels, Belgium
 - c. <https://picinternational.net> The 9th PIC International conference aims to connect, educate, and inspire the photonic integrated circuit (PIC) industry. With

presentations covering seven sectors, attendees will gain insights into topics like Hybrid PICs: Pioneering New Frontiers in Photonic Integration; PIC Packaging: Securing Optimal Integration and Performance; Quantum Era: Unleashing PICs' Boundless Potential; Rapid Scaling: Foundries Fuelling PICs' Mass Production; Accelerating PIC Adoption in Established Markets; PIC Size and Simulation: Enhancing Design Efficiency, and Power Efficiency: Minimizing Consumption in PICs.

- 417) Invited talk for Lightwave Logic (LWLG) retail investor base, Antwerp, Belgium. Investor as part of a multi-company retail investor conference. Talk entitled, “Recent commercial and technical progress in Lightwave Logic polymer modulators.”
 - a. 19th April 2024
 - b. Crown Plaza Hotel, Antwerp, Belgium
 - c. Organized by Belgium and Dutch retail investors as part of a 150 person conference.
- 418) Invited keynote speaker at Safecapital investor conference in Ghent with talk entitled, “Recent progress in commercializing electro-optic polymers” hosted by Brecht Arnaert, Chief Editor www.safecapital.eu with Safecapital Lente meeting, Vander Valk Hotel, Ghent.
 - a. 20th April 2024
 - b. Vander Valk Hotel, Ghent, Belgium
 - c. Safecapital organized a retail investor event with an invite for Lightwave Logic to present and network with investors: <https://tixoom.app/brechtarnaert/ur0v1eff>
- 419) Project advisor and panelist: European Commission HORIZON-CL4-2021-DIGITAL-EMERGING-01-07 LOLIPOP EU project number 101070441 for 2nd review meeting (virtual).
 - a. 29th April 2024
 - b. European Commission: <https://horizon-de-lolipop.eu>
 - c. LOLIPOP: Lithium NiObate empowered siLIcon nitride Platform for fragmentation free Operation in the visible and the NIR. Material technology includes LNOI (lithium niobate on insulator) and TFLN (thin film lithium niobate).
- 420) Invited speaker for HC Wainwright non-deal roadshow presenting Lightwave Logic investor presentations to selected funds, investment banks etc.
 - a. 30th April 2024
 - b. HW Wainwright banking <https://hcwevents.com>
 - c. HW Wainwright organized a NDR for LWLG Inc., <https://hcwco.com/about-us/our-history/>
- 421) Invited speaker and presentation at Lightwave Logic Annual Shareholder meetings 2024 with Business Management Update, and presentation entitled, “Lightwave logic CEO management review”
 - a. 22nd May 2024
 - b. Presentation can be found at:
https://viavid.webcasts.com/viewer/event.jsp?ei=1661614&tp_key=0e4b468303

- 422) Invited speaker to chair Lightwave Logic Inc's Annual Shareholder Meeting (ASM) at the Inverness Hilton, Englewood, Colorado.
- 22nd May 2024
 - Lightwave logic Inc., Denver, Colorado:
https://viaavid.webcasts.com/viewer/event.jsp?ei=1661614&tp_key=0e4b468303
 - Read script, chair voting procedures for Lightwave Logic Annual shareholder meeting for Lightwave Logic Inc.
- 423) Invited Webinar and virtual fireside chat with Maxim equity research analyst Matthew Galinko as part of their TMT Conference
- 4th June 2024
 - Virtual interview/fireside chat and webinar.
 - Maxim equity research <https://maximgrp.com/divisions/equity-research>
- 424) Invited keynote speaker at ISLiST VII (VIIth International School of Light Sciences and Technologies (in collaboration with UIMP (Unversidad Internacional Menedez Pelayo), with keynote talk entitled, "Next Generation of Photonics Integrated Circuits as key for communications and sensing"
- 17th June 2024
 - Talk given at Palacio de la Magdalena (royal palace of Magdalena), Santander, Spain.
 - Conference organized by Professor Jose Miguel Lopez Higuera as part of light in communications, sensing and lighting.
- 425) Invited and recorded TV interview: Benzinga All Access Fireside Chat (15mins inclusive of Q&A) as part of the Zunaïd Suleman show.
- Recorded TV interview on 8th August 2024 for release 12th August 2024
https://www.youtube.com/watch?v=CEZ51a_HTpY
 - Video interview can be found at: <https://www.benzinga.com> and https://www.youtube.com/watch?v=CEZ51a_HTpY and the Zunaïd Suleman show/background at <https://www.benzinga.com/events/speakers/zunaïd-suleman/>
 - Location: Virtually recorded in San Francisco, CA.
- 426) Invited talk at HC Wainwright conference called: 'H.C. Wainwright 26th Annual Global Investment Conference', with a talk entitled, "Faster by design" and link to website:
https://nqwfwxkab.cc.rs6.net/tn.jsp?f=001HNmOJkwLV6iDTd9M6szjF4dgaKY7RbqXC BMA13-ZV_cJ5uO65rM2bMB8Cf3OFxUedu25J8jukebVGEuEcGEXoxga71OC9oBvxYr2CeTY hLMcyKD-l_RlhSgDvUQY_cOQUbN2rY5IGSX6ei8KBhK0r5woZnwTCRPx&c=oCrkIG6Is3Y1Q-3fBcnsY4AJ0IwiYDMzj3okgRwzDLURILnnZsoBnQ==&ch=3cs2_cAXICQ8aLM2FB2Px9PgPIYrKVMe_hkBpE-iU-g1rHtTh5_huw==
- 9th and 10th September 2024 (talk on 10th September 2024)
 - Meeting organized by HC Wainwright Investment Banking
(<https://my.ct.events/preview.aspx?type=attendee&meid=ca094a14-8507-4e5b->

- [ab2c-f2a55c6e6913&jid=e762687f-678d-4ef7-8b88-b9b01f65aa4a&did=6bebbf91-e4f6-4177-b397-6858a60c6b8a&cid=8691ad74-8fa3-4b40-979c-e4e34a999c62](https://www.linkedin.com/feed/update/urn:li:activity:7243920742885543936/)). Location: Lotte Palace Hotel, New York City, NY
- 427) Invited interview with Jose Pozo, CTO Optica, at Lightwave Logic plant facilities, with the interview taking place in LWLG's chemistry and high speed testing laboratories.
- a. 19th September 2024
 - b. Lightwave Logic Inc., facilities at Englewood, Colorado
 - c. <https://www.linkedin.com/feed/update/urn:li:activity:7243920742885543936/>
- 428) Invited talk Corporate Engagement Council, Optical Board of Directors, Strategic planning roadmap
- a. 20th September 2024
 - b. Colorado Convention Center, Denver, Colorado
 - c. www.optica.com
- 429) Invited talk ECOC Market Focus, entitled "World class performance for 200Gbps PAM4 and 400Gbps PAM4 lanes from electro-optic polymer modulators." Market Focus Exhibit session, opening talk, at ECOC 2024 conference (<https://www.ecocexhibition.com/visit/market-focus/>), and (<https://www.ecocexhibition.com/visit/market-focus/market-focus-timetable-2024/>)
- a. 23rd September 2024
 - b. ECOC 2024, Messe convention center, Frankfurt, Germany
 - c. Market Focus sessions as part of ECOC Exhibit, session on modules/sub-systems, opening talk
- 430) Invited fireside chat/interview with David Welch (Board member Infinera, and CEO of Atto-tude), as part of ECOC Market Focus session on modules/sub-systems, with Jose Pozo as host (<https://www.ecocexhibition.com/visit/market-focus/market-focus-timetable-2024/>)
- a. 23rd September 2024
 - b. ECOC 2024, Messe convention center, Frankfurt, Germany
 - c. Market Focus sessions as part of ECOC Exhibit, session on modules/sub-systems
- 431) Invited Chairman and moderator Market Focus, Sessions 1 & 2 Monday, and session 3 Tuesday (<https://www.ecocexhibition.com/visit/market-focus/>)
- a. 23rd and 24th September 2024
 - b. ECOC 2024, Messe convention center, Frankfurt, Germany
- 432) Chairman and moderator Market Focus as part of ECOC Exhibit, Sessions called components/IC/PIC/Fiber as well as modules/sub-systems (<https://www.ecocexhibition.com/visit/market-focus/market-focus-timetable-2024/>)
- 433) Invited interview ECOC TV on Market Focus industry awards on day 2 of ECOC Exhibit with James Page, discussing day 1 market focus and the ECOC Market Focus industry awards ceremony.
- a. 24th September 2024
 - b. ECOC 2024, Messe convention center, Frankfurt, Germany

- c. Interview by ECOC TV James Page, on market focus industry awards.
- 434) Invited interview ECOC TV on Lightwave Logic, and invited talk entitled “World class performance for 200Gbps PAM4 and 400Gbps PAM4 lanes from electro-optic polymer modulators.” of market focus with James Page.
 - a. 24th September 2024
 - b. ECOC 2024, Messe convention center, Frankfurt, Germany
 - c. Interview by ECOC TV James Page, on market focus industry awards.
- 435) Invited presenter for ECOC awards, as chair of industry awards committee
<https://www.ecocexhibition.com/industry-awards/> and <https://youtu.be/wKRNdD6x-pg>
 - a. 24th September 2024
 - b. ECOC 2024, Messe convention center, Frankfurt, Germany
 - c. Product Focus session, ECOC Exhibition Industry Award Winner Announcement
- 436) Winner: Acceptance of glass trophy for ECOC Industry awards on behalf of Lightwave Logic in the optical hybrid integration category:
<https://youtu.be/KYYQjVHfDq8> and <https://www.ecocexhibition.com/visit/ecoc-exhibition-industry-awards/> and <https://opticalconnectionsnews.com/2024/10/ecoc-2024-exhibition-industry-awards/>
 - a. 24th September 2024
 - b. Product Focus session, ECOC Exhibition Industry Award Winner Announcement
 - c. ECOC 2024, Messe convention center, Frankfurt, Germany
- 437) Invited panel moderator for CEO panel at the 1st Annual Meeting of Optica’s Global Photonics Economic Forum (GPEF). Panel entitled, “CEO Panel”, with CEO’s from Coherent (retired Chairman/CEO Chuck Vincent Mattera), Jabil (EVP Matt Crowley), Thorsten Mayer (CEO Vanguard representing Anders Linquist, CEO Mycronic), and John Lee, CEO MKS
(https://www.optica.org/events/industry_events/2024/global_photonics_economic_forum_2024/schedule/)
 - a. 1st October 2024
 - b. Global Photonics Economic Forum (GPEF), FYMCA [FYCMA, Palace of Congresses and Exhibitions Málaga, Spain](#)
 - c. Optica’s GPEF can be found at:
https://www.optica.org/events/industry_events/2024/global_photonics_economic_forum_2024/location/ and
https://www.optica.org/events/industry_events/2024/global_photonics_economic_forum_2024/about/ . The Global Photonics Economic Forum aims to create a trusted platform for collaboration and innovation, addressing the industry's most pressing challenges and opportunities. With the rapid advancement of photonics technology and its increasing relevance across various sectors, the forum comes at a crucial time. The forum’s discussions will explore the complexities introduced by geopolitical tensions, such as those surrounding the Chips Act, and the critical role of photonics in meeting the surging energy demands of artificial intelligence and data centers.

- 438) Invited interview optical connections by Peter Dykes, Editor, Optical connections.
Subject: Lightwave Logic history, technology progress and future roadmap opportunities
- 4th October 2024
 - Virtual video interview by Peter Dykes, Editor, Optical connections Magazine
 - Optical Connections has been providing the fibre optic community with the latest industry news and reports since 2011 via its website, monthly newsletter and now quarterly magazine. Optical connections media provides coverage of market influencing technology advancements, commercial prospects, product developments and editorial insight.
- 439) Interview with Benzina with Meg Flippin, entitled, “Lightwave Logic presents at European Conference on Optical Communications and takes home award” and can be found at: <https://www.benzinga.com/partner/emerging-markets/24/10/41311612/lightwave-logic-presents-at-2024-european-conference-on-optical-communications-takes-hom>
- Published 14th October 2024
 - Benzinga
 - Location: Virtually recorded at the Global Photonics Economic Forum, Malaga, Spain, October 2024
- 440) Project advisor and panelist: European Commission HORIZON-CL4-2022-DIGITAL-EMERGING-01-57 RETINA EU project number 101135529 for 1st review meeting (virtual meeting).
- 21st October 2024
 - European Commission: <https://retina-project.eu>
 - RETINA: the consortium project aims to create a holistic framework for the development of next-generation hardware and software solutions, including innovative LIDAR solutions and CMOS imaging technologies.
- 441) Industry award “Photonics 100 for 2025” by Europascience <https://www.europascience.com/publications/> and Electro Optics Publication (photonics business applications and technology), <https://www.electrooptics.com/> . The award is based on exceptional contributions and achievements in the field of photonics as well a level of dedication and innovation that continues to inspire and advance the photonics industry.
- 28th October 2024 (published and announced)
 - Electro Optics Publication <https://www.electrooptics.com/>
 - EO publication is a resource for entrepreneurs, engineers and researchers involved in photonics business, technology and applications. It gives access to news of the latest technological developments, trends and opinions in the photonics industry as well as independent, in-depth editorial content. It also provides informed commentary and analysis on topics of interest for those involved in the photonics industry.
- 442) Invited article from Gazettabyte (www.gazettabyte.com) and editor Roy Rubenstein on the review and reflections from 50th ECOC conference in Frankfurt, October 2024. Article can be located at;

<https://www.gazettabyte.com/home/2024/10/29/ecoc-2024-industry-reflections-final-part.html>

- a. 29th October 2024 (published)
 - b. Gazettabyte publication (<https://www.gazettabyte.com>)
 - c. Gazettabyte is a resource for the optical community. It includes in-depth features on datacom and telecom topics as well as information targeted at individuals working in the optical industry.
- 443) Invited and recorded TV interview: Benzinga All Access Fireside Chat 20 mins inclusive of Q&A) as part of the Dan Leach show (<https://www.youtube.com/watch?v=vhbdiv8jXmvQ>)
- a. Recorded TV interview on 12th November 2024 for release 14th November 2024
 - b. Video interview can be found at: <https://www.benzinga.com> and <https://www.youtube.com/watch?v=vhbdiv8jXmvQ> and the Dan Leach show/background
 - c. Location: Virtually recorded in Englewood, Denver, CO.
- 444) Reviewer: (European Commission) for project Forte which is a project that is developing frequency-agile lasers for photonic sensing. Role of innovation radar expert in addition to technical expert reviewer.
- a. 27th November 2025
 - b. Virtual meeting for the consortium
 - c. Forte is an EU project to a prototype and mature photonic integrated circuit-based frequency-agile ultra-low noise laser technology, and apply it to the domain of fiber sensing and FMCW LiDAR.
 - d. <https://forte-project.eu>
- 445) Invited interview and article: Optical Connections News, Industry Focus, interview with Peter Dykes, Editor. Article titled, “Electro-optic polymers: A revolution in optical switching” www.opticalconnectionsnews.com
- a. 29th November 2024 (for release in Optical Connections News early 2025)
 - b. Article can be found at www.opticalconnectionsnews.com
 - c. Location: Virtually recorded in Englewood, Denver, CO.
- 446) Reviewer (European Commission) for pilot line Medphab
- a. 5th December 2024
 - b. Virtual meeting with consortium and European Commission
 - c. MedPhab is a pilot line that is focused on bringing to commercial market silicon photonics-based technologies for medical applications. Demonstrator use-cases as prototype products have been selected for the validation of the pilot line technologies covering both *in-vivo* and *in-vitro* domains. The demonstrator cases include: manufacturing a disposable plasmonic-fluidic sensors and a wearable PCI temperature sensor.
 - d. <https://medphab.eu>
- 447) Invited interview and/or podcast with “All things Photonics” from Photonics Spectra and Photonics Media.
- a. Published 10th December 2024 (recorded Nov 2024)

- b. Article can be found at https://www.photonics.com/Podcast/Electro-Optic_Polymers_with_Michael_Lebby_and/p5/pc1/pce89
- c. Location: Virtually recorded at Englewood, Denver, CO
- 448) Reviewer: (European Commission) for project PhotoGeNIC
 - a. 11th December 2024
 - b. Virtual meeting for the consortium
 - c. PhotoGeNIC is an EU project for VCSEL based technology for Germanium wafers. It consists of eight partners from five countries (AT, BE, DE, FR, PL) including highly specialised SMEs, qualified university, advance research organisation and leading industrial companies. The goal is to develop VCSEL industrial technology applying Ge large diameter substrates.
 - d. <https://horizon-photogenic.eu>

2025

- 449) Invited interview with Laser Focus editor Justin Murphy, Editor, [LASER FOCUS WORLD](https://www.laserfocusworld.com), on the subject of photonics, roadmaps, entrepreneurship and intrapreneurship, current trends in the industry and taking technologies from research to volume production. .
 - a. 8th January 2025
 - b. Laser Focus world can be found at: <https://www.laserfocusworld.com> and the magazine at: <https://www.laserfocusworld.com/magazine>
 - c. Laser Focus World
- 450) Invited moderator for Optica's VIP Executive Reception at the Museum of Modern Art (MoMA) as part of Photonics West Conference, San Francisco, 2025 to introduce and chair the question and answer session for Teledyne Technology's CEO Edwin Roks,
https://www.optica.org/events/industry_events/2025/vip_executive_reception/
 - a. 27th January 2025
 - b. Optica's reception talk can be viewed at: <https://www.youtube.com/watch?v=-v9S6-2Lvz8>
 - c. Location: Museum of Modern Art, San Francisco, as part of SPIE's Photonics West conference.
- 451) Keynote speaker for EPICs EU Projects, Pilot Lines & Innovation Hubs Breakfast event with a talk entitled, "Innovative approaches to commercialize photonics" <https://epic-photonics.com/events/eu-projects-innovation-hubs-breakfast-2025/>
 - a. 28th January 2025
 - b. EPIC Pilot Line projects and innovation hubs meeting
 - c. Location: W hotel San Francisco, as part of SPIE's Photonics West Conference, 2025
- 452) Reviewer: (European Commission) for project InSiDe
 - a. 5th March 2025

- b. Face to face meeting for the consortium both at Medtronic and Maastricht children's hospital.
 - c. InSiDe is an EU project for PIC based technology in the medical field to monitor blood flow and artery stiffness in the human body using long wavelength lasers and silicon photonics. Hospital clinical trials were conducted. It is a follow-on with more clinical trials from an initial CARDIS EU project.
 - d. <http://www.inside-h2020.eu>
- 453) Invited talk Corporate Engagement Council, Optical Board of Directors, Strategic planning roadmap and game changers
- a. 22th March 2025
 - b. Optica Headquarters, Washington DC
 - c. www.optica.com
- 454) Invited moderator for Optica's Executive forum CEO panel at OFC 2025 at the Marriot Marquis Hotel in San Francisco, California,
(https://www.optica.org/events/industry_events/2025/optica_executive_forum_at_ofc_2025/?utm_source=google&utm_medium=cpc&utm_keyword=&utm_device=c&matchtype=&location=9196351&utm_campaign=&gad_source=1&gbraid=0AAAAABo5sUp5WtBxkL9yvTI8AELbjDYYJ&gclid=CjwKCAjwzMi_BhACEiwAX4YZUNuSg40saecgOB SYspVVYP8nYj04tn80bOqng_CcyuNRUOaentjPChoCYf0QAvD_BwE). The CEO panel consisted of Gary Smith, CEO Ciena; Michael Hurlston, CEO Lumentum; Jim Anderson, CEO Coherent; Hong Hou, CEO Semtech Corporation.
- a. 31st March 2025
 - b. Details of the Executive Forum can be found at:
https://www.optica.org/events/industry_events/2025/optica_executive_forum_at_ofc_2025/program/?_gl=1*11x2mf9*_up*MQ..*_gs*MQ..&gclid=CjwKCAjwzMi_BhACEiwAX4YZUNuSg40saecgOB SYspVVYP8nYj04tn80bOqng_CcyuNRUOaentjPChoCYf0QAvD_BwE&gbraid=0AAAAABo5sUp5WtBxkL9yvTI8AELbjDYYJ located at the Marriot Marquis, San Francisco, California
- 455) Invited Chair and conference moderator for the 2nd ESS (Executive Strategy Summit) – a global perspective that includes electronics, semiconductors, photonics, sensing with focus a) economic trends and market drivers, b) funding opportunities, c) intellectual property, patents, mergers and acquisitions. <https://angel-tech.net/executivestrategysummit/agenda>
- a. 7th April 2025
 - b. Brussels, Belgium
 - c. <https://angel-tech.net/executivestrategysummit> The conference will delve into key topics such as emerging economic trends, disruptive technologies, market forecasts, and funding strategies. By exploring these areas, attendees will gain a deeper understanding of the market landscape and the implications for their business strategies. Moreover, they will gain valuable insights into how to navigate the complex funding landscape and capitalize on growth opportunities in the CS, PIC and PE industries.

- 456) Invited speaker for 2nd ESS entitled, “European Pilot Lines for Photonics” .
<https://angel-tech.net/executivestrategysummit/agenda>
- 457) Brussels, Belgium
- a. <https://angel-tech.net/executivestrategysummit> The 10th PIC International conference aims to connect, educate, and inspire the photonic integrated circuit (PIC) industry. The "European Pilot Lines for Photonics" session brings together industry experts to explore the transformative role of pilot lines in driving innovation and fostering a robust ecosystem for commercialization. With Europe at the forefront of photonics research and development, this session will delve into the capabilities and strategic importance of European pilot lines in accelerating the transition from lab-scale breakthroughs to industrial-scale production. Panelists will discuss collaborative efforts, technological advancements, and the challenges of scaling photonics technologies while highlighting the critical role of public-private partnerships in maintaining Europe's competitive edge. This discussion aims to provide insights into how pilot lines are shaping the future of the photonics industry.
- 458) Invited panel speaker for 2nd ESS panel entitled, “European Pilot Lines for Photonics” with panel members from Fraunhofer HHI, TU Eindhoven, GenusTechnik, IMEC. . <https://angel-tech.net/executivestrategysummit/agenda>
- a. 7th April 2025
- b. Brussels, Belgium
- c. <https://angel-tech.net/executivestrategysummit> The 10th PIC International conference aims to connect, educate, and inspire the photonic integrated circuit (PIC) industry. The "European Pilot Lines for Photonics" session brings together industry experts to explore the transformative role of pilot lines in driving innovation and fostering a robust ecosystem for commercialization. With Europe at the forefront of photonics research and development, this session will delve into the capabilities and strategic importance of European pilot lines in accelerating the transition from lab-scale breakthroughs to industrial-scale production. Panelists will discuss collaborative efforts, technological advancements, and the challenges of scaling photonics technologies while highlighting the critical role of public-private partnerships in maintaining Europe's competitive edge. This discussion aims to provide insights into how pilot lines are shaping the future of the photonics industry.
- 459) Invited conference co-chair (with David Cheskis) for 10th PIC (PIC International Conference) <https://picinternational.net/agenda>
- a. 8th and 9th April 2025
- b. Brussels, Belgium
- c. <https://picinternational.net> The 9th PIC International conference aims to connect, educate, and inspire the photonic integrated circuit (PIC) industry. With presentations covering seven sectors, attendees will gain insights into topics like Hybrid PICs, Photonic Integration, PIC Packaging, Quantum PICs, Scaling of PICs, Volume Production, PIC Size and Simulation, PIC Power Efficiency.

- 460) Project advisor and panelist: European Commission HORIZON-CL4-2021-DIGITAL-EMERGING-01-07 LOLIPOP EU project number 101070441 for 3rd review meeting (partially virtual, meeting in EU Commission Brussels).
- 10th April 2025
 - European Commission: <https://horizon-de-lolipop.eu>
 - LOLIPOP: Lithium NiObate empowered siLIcon nitride Platform for fragmentation free OPERATION in the visible and the NIR. Material technology includes LNOI (lithium niobate on insulator) and TFLN (thin film lithium niobate).
- 461) Project advisor and panelist: European Commission PhotonHub EU project number/grant agreement 101016665 for 3rd review meeting (virtual). Project call [DT-ICT-04-2020 - Photonics Innovation Hubs](#)
- 11th and 12th June 2025
 - European Commission: <https://www.photonhub.eu> and <https://cordis.europa.eu/project/id/101016665>
 - PhotonHub: PhotonHub Europe is a unique European full-service one-stop-shop Photonics Innovation Hub to advance EU competitiveness. Project review included technical assessment, financial, marketing, and operational reviews.
- 462) Project advisor and panelist: European Commission HORIZON-CL4-2022-DIGITAL-EMERGING-01-57 RETINA EU project number 101135529 for 2nd review meeting (virtual meeting).
- 13th June 2025
 - European Commission: <https://retina-project.eu>
 - RETINA: the consortium project aims to create a holistic framework for the development of next-generation hardware and software solutions, including innovative LIDAR solutions and CMOS imaging technologies.
- 463) Invited speaker for EPICs Integrated photonics applications stage at the Laser World of Photonics (LWoP) 2025 with a talk entitled, “Commercializing integrated photonics with broad applications using EU based pilot lines”. <https://epic-photonics.com/events/integrated-photonics-applications-stage-at-the-laser-world-of-photonics-2025/>
- 24th June 2025
 - Laser World of Photonics photonics forums in integrated photonics applications 24th June 2025 organized by Chair Dr Abdul Rahim from Photon Delta.
 - Location: International conference (messe) Munich as part of the Laser World of Photonics conference, 24-28th June 2025.
- 464) Invited speaker for a talk entitled “Nurturing your photonics career”, at the University of Oxford, St Hugh’s College, and School of Engineering.
- 27th June 2025
 - St. Hughs college, School of Engineering, Oxford University, UK at the request of Engineering optics and photonics professor Martin Booth.

- c. The talk consisted of career directions for students, post graduates in optics and photonics, and included analysis of entrepreneurial and intrapreneurial industrial and commercial observations.