Office Action Summary	Application No. 15/971,621	Applicant(s) LUO et al.	
	Examiner Daniel Petkovsek	Art Unit 2874	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on the application and claims filed May 4, 2018.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-9 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-9 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on May 4, 2018 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☑ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☑ All b)☐ Some** c)☐ None of the:

1.☑ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date 12/13/18; 12/5/18.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

This office action is in response to the application and claims filed May 4, 2018. Claims 1-9 are pending, with claim 1 being the sole independent.

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Priority

2. Receipt is acknowledged of certified copies of papers required by 37 CFR 1.55.

Information Disclosure Statement

3. The prior art documents submitted by Applicant in the Information Disclosure Statements filed on December 13, 2018 and December 5, 2018, have been considered and made of record (note attached copy of forms PTO-1449).

Claim Rejections - 35 USC § 112

4. The following is a quotation of 35 U.S.C. 112(b):

> (b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 3-9 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly

claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

-Regarding claims 3 and 4, the phrases "disposed over *or in proximity* of the photodiode array" and "mounted over *or in proximity* of the photodiode array" are are relative terms which renders the claim indefinite. The term "in **proximity** of" of these phrases are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Further, in claims 3 and 4 there is no clarity what would be considered *outside the scope* of "in proximity of" in these claims.

-Regarding claims 3, 4, and 8, these claims recites the limitations "a *first plurality* of ferrules", "a *second plurality* of ferrules", and "a *third plurality* of ferrules." Note that claims 3, 4, and 8 each depend from claim 2, which depends from sole pending independent claim 1. Independent claim 1 recites "ferrules" as the first outlined ferrule components. As such, there is insufficient *antecedent* basis for these limitations in the claims 3, 4, and 8 because the claims are not clearly defining the "ferrules" in question, and also ***directly conflict*** with the "ferrules" of claim 1.

6. For these reasons above, claims 3, 4, and 8 overall are rejected as being **vague and indefinite** under the requirements of 35 U.S.C. 112(b). Also, further dependent claims 5-7 and 9 are rejected at least as including each limitation of claims 3, 4, or 8. At this point of prosecution, any claim 3-9 cannot be *reasonably* and concisely examined on the merits with regard to ***prior art*** of record. Only claims 1-2 are examined herein.

Claim Rejections - 35 USC § 103

7. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

8. This application currently names joint inventors. In considering patentability of the claims the examiner presumes that the subject matter of the various claims was commonly owned as of the effective filing date of the claimed invention(s) absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and effective filing dates of each claim that was not commonly owned as of the effective filing date of the later invention in order for the examiner to consider the applicability of 35 U.S.C. 102(b)(2)(C) for any potential 35 U.S.C. 102(a)(2) prior art against the later invention.

9. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> 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. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103 are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 1-2 are rejected under 35 U.S.C. 103 as being unpatentable over Schamuhn et al. US 2015/0316732 A1, and further in view of de Jong US 2016/0131854 A1.

Schamuhn et al. US 2015/0316732 A1 teaches (ABS; Figures 1, 2, 4; paragraphs [0033] – [0048]; Claims) an optical transceiver module capable of "*high*-speed" operation (note *frame-of-reference*), comprising: a printed circuit board assembly component 16 having a receiver and a transmitter (transceiver overall), and a passive optical element, wherein the receiver comprises an amplifier chip 47 and a photodiode array 41 connected to pins of the amplifier chip ("pins" not shown but inherently in integrated operation of chip/diodes), the transmitter comprises a laser driving chip 43 and a base 42, the base comprises a plurality of lasers arranged side by side (VCSEL is an *array* of lasers), the plurality of these lasers at 42 are connected to the laser driving chip (in operation inherent "connectivity"); a plurality of fiber interfaces are arranged on output light paths corresponding to the lasers (fibers 4 are arranged and aligned to proper laser output path as an "interface" with such components); the passive optical element comprises a ferrule 13 corresponding to these multitude of fiber optical interfaces (paragraphs [0033] – [0048]).

Regarding sole pending independent claim 1, Schamuhn et al. '732 does not *expressly* teach that the "ferrule" is ***ferrules*** (plural) in which these sub-unit individualized ferrules are inserted into the plurality of fiber interfaces in a one-to-one correspondence.

de Jong US 2016/0131854 A1 teaches (ABS; Figures 1A, 1B, 2; corresponding text, see most particularly **paragraphs [0025] – [0026]**) a passive optical element that is a ferrule, but this ferrule includes sub-features such as individualized ferrules 18 that can be separated and usable individually in a one-to-one configuration at an optical connection location such as with a transceiver component ([0026]). The advantages and utilities of this type of ferrule connector are discussed in [0026] and can be usable with the evolving use of higher-speed transceiver components in telecommunications.

Since Schamuhn et al. '732 and de Jong '854 are both from the same field of endeavor, the purpose disclosed by de Jong '854 would have been recognized in the pertinent art of Schamuhn et al. '732.

A person having ordinary skill in the art at the time of the effective filing of the current application would have recognized the teaching of de Jong '854, to use a passive optical element that is a ferrule with a number of sub-ferrules that can be individualized and usable separately, or with higher speed capacity capabilities, in the device of Schamuhn et al. '732 to improve optical coupling efficiency for high-speed transceivers. See *KSR v. Teleflex*, 127 S.Ct. 1727 (2007). There is no **patentable** distinction of independent claim 1 when considering the combined teachings of Schamuhn et al. '732 and further in view of de Jong '854.

Regarding dependent claim 2, the array of Schamuhn et al. '732 is at least 4 lasers, which the prior art secondary reference of de Jong '854 teaches at least four sub-ferrules and representing at least four fiber optic interface positions.

12. Claims 1-2 are rejected under 35 U.S.C. 103 as being unpatentable over Li et al. U.S.P. No. 9,482,819 B2, and further in view of de Jong US 2016/0131854 A1.

Li et al. U.S.P. No. 9,482,819 B2 teaches (ABS; Figures 1, 4, 5, 7-9; corresponding text, in particular columns 1-2, column 5, line 27 through column 6, line 19; Claims) an optical transceiver module capable of "*high*-speed" operation (note *frame-of-reference*), comprising: a printed circuit board assembly component ("PCB Assembly") having a receiver and a transmitter (TOSA and ROSA), and a passive optical element (right sides of Figs. 1, 4, 5), wherein the receiver comprises an amplifier chip (trans-impedance-amplifier TIA "chip" noted in ROSA) and a photodiode array (photo-detectors in ROSA) connected to pins of the amplifier chip ("pins" not shown but inherently in integrated operation of chip/diodes), the transmitter comprises a laser driving chip (TOSA *inherently* has a "driver" to drive the laser(s)) and a base (at least "holding substrate" upon which lasers are placed), the base comprises a plurality of lasers arranged side by side (array of lasers, at least four shown in TOSA), the plurality of these lasers are inherently connected to a laser *driving* chip (in operation inherent "connectivity"); a plurality of fiber interfaces are arranged on output light paths corresponding to the lasers (fibers as ribbons or fibers links to the output paths as an "interface" with such components); the passive optical element comprises a ferrule

(MPO or MTP connection and array fiber ferrule shown in Fig. 4) corresponding to these multitude of fiber optical interfaces.

Regarding sole pending independent claim 1, Li et al. '819 does not *expressly* teach that the "ferrule" is ***ferrules*** (plural) in which these sub-unit individualized ferrules are inserted into the plurality of fiber interfaces in a one-to-one correspondence.

de Jong US 2016/0131854 A1 teaches (ABS; Figures 1A, 1B, 2; corresponding text, see most particularly **paragraphs [0025] – [0026]**) a passive optical element that is a ferrule, but this ferrule includes sub-features such as individualized ferrules 18 that can be separated and usable individually in a one-to-one configuration at an optical connection location such as with a transceiver component ([0026]). The advantages and utilities of this type of ferrule connector are discussed in [0026] and can be usable with the evolving use of higher-speed transceiver components in telecommunications (***MPO*** cited also).

Since Li et al. '819 and de Jong '854 are both from the same field of endeavor, the purpose disclosed by de Jong '854 would have been recognized in the pertinent art of Li et al. '819.

A person having ordinary skill in the art at the tie of the effective filing of the current application would have recognized the teaching of de Jong '854, to use a passive optical element that is a ferrule with a number of sub-ferrules that can be individualized and usable separately, or with higher speed capacity capabilities, in the device of Li et al. '819 to improve optical coupling efficiency for high-speed transceivers, in particular because Li and de Jong both cite ***MPO*** type connections. See *KSR v. Teleflex*, 127 S.Ct. 1727 (2007). There is no **patentable** distinction of independent

claim 1 when considering the combined teachings of Li et al. '819 and further in view of de Jong '854.

Regarding dependent claim 2, the array of Li et al. '819 is at least 4 lasers, which the prior art secondary reference of de Jong '854 teaches at least four sub-ferrules and representing at least four fiber optic interface positions.

Inventorship

13. This application currently names joint inventors. In considering patentability of the claims the examiner presumes that the subject matter of the various claims was commonly owned as of the effective filing date of the claimed invention(s) absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and effective filing dates of each claim that was not commonly owned as of the effective filing date of the later invention in order for the examiner to consider the applicability of 35 U.S.C. 102(b)(2)(C) for any potential 35 U.S.C. 102(a)(2) prior art against the later invention.

Conclusion

14. The prior art made of record is considered pertinent to applicant's disclosure: PTO-892 form references A-J and N.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Petkovsek whose telephone number is (571) 272-4174. The examiner can normally be reached on M-F 7:30 - 6 PM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Uyen-Chau Le can be reached on (571) 272-2397. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DANIEL PETKOVSEK/
Primary Examiner, Art Unit 2874
March 13, 2019

Notice of References Cited	Application/Control No. 15/971,621	Applicant(s)/Patent Under Reexamination LUO et al.	
	Examiner Daniel Petkovsek	Art Unit 2874	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20150316732-A1	11-2015	Schamuhn; Kai	G02B6/4284	398/139
*	B	US-9482819-B2	11-2016	Li; Yao	G02B6/29365	1/1
*	C	US-7329054-B1	02-2008	Epitaux; Marc	G02B6/4249	385/89
*	D	US-20160131854-A1	05-2016	de Jong; Michael	G02B6/3879	385/59
*	E	US-6305848-B1	10-2001	Gregory; Bryan R.	G02B6/4246	385/134
*	F	US-20170187462-A1	06-2017	LUO; Jian-Hong	G02B6/4206	1/1
*	G	US-10088639-B2	10-2018	Mentovich; Elad	G02B6/4243	1/1
*	H	US-20170248763-A1	08-2017	Kawamura; Hiroshi	G02B6/421	1/1
*	I	US-9553671-B1	01-2017	Nagarajan; Radhakrishnan L.	H04B10/40	1/1
*	J	US-20120301152-A1	11-2012	EDWARDS; Phillip	G02B6/4201	398/135
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N	CN-203414640-U	01-2014	CN	SUN XIAOCHEN	G02B 6/42
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	15971621
Filing Date	2018-05-04
First Named Inventor	LUO
Art Unit	
Examiner Name	
Attorney Docket Number	AOIC008

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5617234		1997-04-01	KOGA ET AL	
	2	7376308	B2	2008-05-20	CHEBEN ET AL	
	3	8831433	B2	2014-09-09	HO ET AL	
	4	7058263	B2	2006-06-06	WELCH ET AL	
	5	7532783	B2	2009-05-12	BAI	
	6	7941053	B2	2011-05-10	DALLESASSE	
	7	9341786	B1	2016-05-17	GAMACHE	
	8	7162124	B1	2007-01-09	GUNN, III ET AL	

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.P/

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Examiner Name	
Attorney Docket Number	AOIC008

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20030174964	A1	2003-09-18	GAO ET AL	
	2	20040161186	A1	2004-08-19	CRAFTS ET AL	
	3	20160149662	A1	2016-05-26	SOLDANO ET AL	
	4	20160349451	A1	2016-12-01	SHEN ET AL	
	5	20170168252	A1	2017-06-15	PEZESHKI ET AL	
	6	20150249501	A1	2015-09-03	NAGARAJAN	
	7	20170307819	A1	2017-10-26	HO ET AL	
	8	20170336582	A1	2017-11-23	LUO ET AL	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]

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Receipt date: 12/05/2018

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15971621
	Filing Date	2018-05-04
	First Named Inventor	LUO
	Art Unit	
	Examiner Name	
	Attorney Docket Number	AOIC008

	1							

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	PCT Search Report and Written Opinion mailed July 6, 2017, received in corresponding PCT Application No. PCT/US17/29350, 9 pgs.	
	2	US Office Action mailed August 21, 2017, received in US Application Serial No. 15/137,823, 13 pgs.	
	3	US Office Action mailed August 29, 2017, received in US Application Serial No. 15/432,242, 15 pgs.	
	4	US Office Action mailed April 13, 2018, received in US Application Serial No. 15/432,242, 28 pgs.	

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EXAMINER SIGNATURE

Examiner Signature	/DANIEL PETKOVSEK/	Date Considered	03/12/2019

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Examiner Name	
Attorney Docket Number	AOIC008

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	9557500	B1	2017-01-31	LUO ET AL	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20170187462	A1	2017-06-29	LUO ET AL	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.P/

Receipt date: 12/13/2018

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	Application Number	15971621
	Filing Date	2018-05-04
	First Named Inventor	LUO
	Art Unit	
	Examiner Name	
	Attorney Docket Number	AOIC008

	1	

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EXAMINER SIGNATURE

Examiner Signature	/DANIEL PETKOVSEK/	Date Considered	03/12/2019

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.P/

Electronic Patent Application Fee Transmittal	
Application Number:	15432242
Filing Date:	14-Feb-2017
Title of Invention:	MULTI-CHANNEL PARALLEL OPTICAL RECEIVING DEVICE
First Named Inventor/Applicant Name:	Jian-Hong LUO
Filer:	Kenneth M. Thompson/April Davis
Attorney Docket Number:	AOIC006

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

AOI_NDCal 4-24cv09041_ 00002255

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
		Total in USD ($)		**240**

AOI_NDCal 4-24cv09041_ 00002256

Electronic Acknowledgement Receipt

EFS ID:	35862820
Application Number:	15432242
International Application Number:	
Confirmation Number:	2079
Title of Invention:	MULTI-CHANNEL PARALLEL OPTICAL RECEIVING DEVICE
First Named Inventor/Applicant Name:	Jian-Hong LUO
Customer Number:	27543
Filer:	Kenneth M. Thompson/April Davis
Filer Authorized By:	Kenneth M. Thompson
Attorney Docket Number:	AOIC006
Receipt Date:	29-APR-2019
Filing Date:	14-FEB-2017
Time Stamp:	16:30:29
Application Type:	Utility under 35 USC 111(a)

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Deposit Account	501705
Authorized User	April Davis

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

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37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		AOIC006_Amendment_asfiled_042919.pdf	41727 1d8d8ab8da6149c8c0cd1c709a6c58a9095db163	yes	6
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Applicant Arguments/Remarks Made in an Amendment		5	6	
	Claims		2	4	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	AOIC006_IDS.pdf	612970 e92d351c7175986791898cd0e94ef38591ada180	no	5
Warnings:					
Information:					
3	Other Reference-Patent/App/Search documents	AOI140_OfficeAction.pdf	869601 ee1b0228688223c435746e1b6f06c8b2cb4c6c31	no	23
Warnings:					
Information:					
4	Other Reference-Patent/App/Search documents	AOIC008_OfficeAction.pdf	623433 aa6151bded847992dee87707068dac5b196d7f43	no	17
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	30624 c83ef7741cf576da9e3b3942fdf0fefa629a28bf	no	2

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Warnings:	
Information:	
Total Files Size (in bytes):	2178355

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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REMARKS

Please reconsider the application in view of the above amendments and the following remarks.

Status of the Claims

Claims 1-3 and 5-8 stand rejected. Claims 1, 2, and 8 are amended herein. No claims are cancelled, and no new claims are added at this time. Accordingly, claims 1-3 and 5-8 remain pending with claims 1 and 8 being independent claims.

Allowable Subject Matter

Applicant notes with appreciation the Examiner's acknowledgement of allowable subject matter in claims 1-3 and 5-8.

Claim Objections

Claims 1-3 and 5-8 were objected to over informalities. In particular, claims 1-3 and 5-8 were objected to over clarity issues related to the claimed "top surface" and "optical signals." Applicant herein amends the claims, as discussed in greater detail below, and respectfully requests reconsideration and withdrawal of the objections.

Rejections under 35 U.S.C. § 112

Claims 1-3 and 5-8 were rejected under 35 U.S.C. 112(b) for allegedly being indefinite. *See Office Action; page 4*. In addition, claims 1-3 and 5-8 were rejected under 35 U.S.C. 112(b) over antecedent issues. *Id*.

Applicant does not concede that these rejections are correct, but herein amends the claims to advance prosecution. In particular, Applicant herein amends claims 1 and 8 to further clarify the "top" surfaces recited in the claims, and further, the antecedent issue regarding the "optical signals."

Claim 2 was also rejected under 35 U.S.C. 102(b) for allegedly conflicting with the amended independent claim 1. *Office Action; page 5*. Applicant respectfully disagrees that this rejection is proper, but for purposes of advancing prosecution, Applicant herein amends dependent claim 2 to clarify "wherein the top surface of the end of the carrier is defined at least in part by a circuit board, and wherein the plurality of optoelectronic diodes and the light receiving chip are directly disposed on the circuit board." Accordingly, Applicant believes that no further clarification is required.

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Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejections under 35 U.S.C. 112.

Conclusion

The claims have been shown to be allowable over the prior art. Applicant believes that this paper is responsive to each and every ground of rejection cited by the Examiner in the Action dated January 28, 2019, and respectfully requests favorable action in this application. The examiner is invited to telephone the undersigned, Applicant's attorney of record, to facilitate advancement of the present application. Please apply any charges not covered, or any credits, to Deposit Account 50-1705 (Reference Number AOIC006).

Respectfully submitted,

GROSSMAN, TUCKER, PERREAULT & PFLEGER PLLC

Date: April 29, 2019

By: /Kenneth M. Thompson/
Kenneth M. Thompson
Reg. No. 72,001

55 S. Commercial Street
Manchester, NH 03101
Telephone: (603) 668-6560
Facsimile: (603) 668-2970

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IN THE CLAIMS

1. (Currently Amended) A multi-channel parallel optical receiving device, comprising:

a carrier;

a light receiving chip disposed on a top surface of an end of the carrier;

a plurality of optoelectronic diodes disposed on the top surface of [[an]] the end of the carrier, and the plurality of optoelectronic diodes electrically connected to the light receiving chip via bonding wire, wherein the optoelectronic diodes and the light receiving chip are disposed directly on the same top surface of the end of the carrier;

an optical fiber connector disposed in ~~another~~ an end of the carrier;

an arrayed waveguide grating further disposed on ~~the~~ a top surface of the carrier that defines a midpoint of the carrier, the arrayed waveguide grating having a first end, a middle, and a second end disposed opposite the first end, and an input end of the arrayed waveguide grating connected to the optical fiber connector for receiving an optical signal from the optical fiber, wherein the top surface of the carrier underlies the middle of the arrayed waveguide grating; and

wherein the optical signal[[s]] ~~are~~ is divided into multi-channel optical signals in parallel by the arrayed waveguide grating based on their wavelengths, ~~the~~ a top surface defined by an output end of the arrayed waveguide grating is at a predetermined angle, causing the multi-channel optical signals reflected by the top surface defined by the output end of the arrayed waveguide grating to be reflected to a photosensitive surface of the plurality of optoelectronic diodes arranged in parallel, wherein the predetermined angle of the top surface defined by the output end of the arrayed waveguide grating is in a range of 41 to 46 degrees such that the top surface provides the reflection.

2. (Currently Amended) The multi-channel parallel optical receiving device according to claim 1, wherein the top surface of the end of the carrier is defined at least in part by a circuit board, and wherein the plurality of optoelectronic diodes and the light receiving chip are directly disposed on the ~~same~~ circuit board.

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3. (Original) The multi-channel parallel optical receiving device according to claim 1, wherein the amount of the optoelectronic diodes is equal to the amount of optical paths divided by the arrayed waveguide grating.

4. (Cancelled)

5. (Previously Presented) The multi-channel parallel optical receiving device according to claim 1, wherein the predetermined angle of the top surface of the output end of the arrayed waveguide grating is 42 degrees.

6. (Original) The multi-channel parallel optical receiving device according to claim 1, wherein a first lens, for coupling the optical fiber, is disposed between the input end of the arrayed waveguide grating and the optical fiber connector.

7. (Original) The multi-channel parallel optical receiving device according to claim 1, wherein the input end of the arrayed waveguide grating is inserted directly into the optical fiber connector and a graded index lens is disposed in an end where the optical fiber connector and the arrayed waveguide grating connect.

8. (Currently Amended) A multi-channel parallel optical receiving device, comprising:

a carrier;

a light receiving chip <u>disposed on a top surface of an end of the carrier</u>;

a plurality of optoelectronic diodes disposed on [[a]] <u>the</u> top surface of [[an]] <u>the</u> end of the carrier, and the plurality of optoelectronic diodes electrically connected to the light receiving chip via wire bonding, wherein the plurality of optoelectronic diodes and the light receiving chip are directly disposed on the same <u>top</u> surface <u>of the end of the carrier</u>;

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an optical fiber connector disposed in ~~another~~ an end of the carrier;

an arrayed waveguide grating further disposed on [[the]] a top surface of the carrier that defines a midpoint of the carrier, the arrayed waveguide grating having a first end, a middle, and a second end disposed opposite the first end, and an input end of the arrayed waveguide grating connected to the optical fiber connector for receiving an optical signal from the optical fiber;

wherein the top surface of the carrier that defines the midpoint of the carrier underlies the middle of the arrayed waveguide grating; and

wherein the optical signal[[s]] ~~are~~ is divided into multi-channel optical signals in parallel by the arrayed waveguide grating based on their wavelengths, ~~the~~ a top surface defined by an output end of the arrayed waveguide grating is at a predetermined angle of 42 degrees, causing the multi-channel optical signals reflected by the top surface defined by the output end of the arrayed waveguide grating to be reflected to a photosensitive surface of the plurality of optoelectronic diodes arranged in parallel.

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UNITED STATES PATENT AND TRADEMARK OFFICE

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NOTICE OF ALLOWANCE AND FEE(S) DUE

27543 7590 05/13/2019

APPLIED OPTOELECTRONICS, INC.
13115 JESS PIRTLE BLVD.
SUGAR LAND, TX 77478

EXAMINER	
PETKOVSEK, DANIEL	
ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 05/13/2019

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/432,242	02/14/2017	Jian-Hong LUO	AOIC006	2079

TITLE OF INVENTION: MULTI-CHANNEL PARALLEL OPTICAL RECEIVING DEVICE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	08/13/2019

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

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APPLIED OPTOELECTRONICS, INC.
13115 JESS PIRTLE BLVD.
SUGAR LAND, TX 77478

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/432,242	02/14/2017	Jian-Hong LUO	AOIC006	2079

TITLE OF INVENTION: MULTI-CHANNEL PARALLEL OPTICAL RECEIVING DEVICE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	08/13/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
PETKOVSEK, DANIEL	2874	385-014000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑Issue Fee ❑Publication Fee (if required) ❑Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/432,242	02/14/2017	Jian-Hong LUO	AOIC006	2079

27543 7590 05/13/2019

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SUGAR LAND, TX 77478

EXAMINER	
PETKOVSEK, DANIEL	
ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 05/13/2019

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

AOI_NDCal 4-24cv09041_ 00002268

Notice of Allowability	Application No. 15/432,242	Applicant(s) LUO et al.	
	Examiner Daniel Petkovsek	Art Unit 2874	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to the amendment filed April 29, 2019.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 1-3 and 5-8 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information , please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☑ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☑ All b) ☐ Some *c) ☐ None of the:

   1. ☑ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file areply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 4/29/19.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/DANIEL PETKOVSEK/
Primary Examiner, Art Unit 2874, May 7, 2019

DETAILED ACTION

This office action is in response to the amendment filed April 29, 2019. In accordance with this amendment, claims 1, 2, and 8 have been amended.

Claims 1-3 and 5-8 remain pending. Claims 1 and 8 are in independent form.

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Information Disclosure Statement

2. The prior art documents submitted by Applicant in the Information Disclosure Statements filed on April 29, 2019, have been considered and made of record (note attached copy of forms PTO-1449).

Allowable Subject Matter

3. Claims 1-3 and 5-8 are allowed. Claims 1 and 8 are independent claims, while claims 2, 3, and 5-7 depend from claim 1. The following is an examiner's statement of reasons for allowance: the closest prior art of record does not expressly teach or *reasonably* suggest, in combination, each claim limitation as embodied by amended independent claims 1 and/or 8. Applicant has made the specific corrections to clearly identify the three distinct "top surface" portions the carrier element (reference #8 in Fig. 1), and has clarified all required claim language of claims 1 and 8. The closest prior art (to Shen et al. '451 and Gamache et al. '786) of the current record does not expressly

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teach or *reasonably* suggest such a **combined** configuration as shown in Applicant's Fig. 1 and those amended claims from April 29, 2019. The Examiner is unable to make a *prima facie* case for obviousness for such combination, most particularly in which the "light receiving chip" (2) and the "optoelectronic diodes" (3) are disposed *directly* on the same surface of the end of the carrier (left end/side in Fig. 1 *same* surface).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

4. Applicant's arguments, see amendment with remarks (pages 5-6), filed April 29, 2019, with respect to the claim amendments that fully address the issues in claims 1, 2, and 8 (note non-final rejection mailed on January 28, 2019) have been fully considered and are *persuasive*. Based on the amendments filed to the claims on April 29, 2019, *all* claim objections and claim rejections under 35 U.S.C. 112(b) mailed January 28, 2019 have been withdrawn. Claims 1-3 and 5-8 now serve to create a ***patentable*** distinction over the closest prior art of record.

Inventorship

5. This application currently names joint inventors. In considering patentability of the claims the examiner presumes that the subject matter of the various claims was commonly owned as of the effective filing date of the claimed invention(s) absent any

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and effective filing dates of each claim that was not commonly owned as of the effective filing date of the later invention in order for the examiner to consider the applicability of 35 U.S.C. 102(b)(2)(C) for any potential 35 U.S.C. 102(a)(2) prior art against the later invention.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Petkovsek whose telephone number is (571) 272-4174. The examiner can normally be reached on M-F 7:30 - 6 PM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Uyen-Chau Le can be reached on (571) 272-2397. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DANIEL PETKOVSEK/
Primary Examiner, Art Unit 2874
May 7, 2019

AOI_NDCal 4-24cv09041_ 00002273

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/432,242	LUO et al.
	Examiner	Art Unit
	Daniel Petkovsek	2874

CPC - Searched*		
Symbol	Date	Examiner
G02B 6/12019, 6/32, 6/4214, 6/4249	05/07/2019	DJP

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Refreshed pertinent EAST searches	05/07/2019	DJP
Analyzed amendment and remarks filed April 29, 2019	05/07/2019	DJP
Conducted further EAST searches for amended claims 1 and 8	05/07/2019	DJP

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	Claim language searched in EAST	05/07/2019	DJP

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/432,242	LUO et al.
	Examiner	Art Unit
	Daniel Petkovsek	2874

CPC							
Symbol						Type	Version
G02B	/	6	/	4249		F	2013-01-01
G02B	/	6	/	12019		I	2013-01-01
G02B	/	6	/	32		I	2013-01-01
G02B	/	6	/	4214		I	2013-01-01
G02B	/	6	/	4281		I	2013-01-01

CPC Combination Sets								
Symbol						Type	Set	Ranking	Version
	/		/						

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	7	
/DANIEL PETKOVSEK/ Primary Examiner, Art Unit 2874	07 May 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20190506

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/432,242	LUO et al.
	Examiner	Art Unit
	Daniel Petkovsek	2874

INTERNATIONAL CLASSIFICATION				
CLAIMED				
G02B	/	6	/	42

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	7	
/DANIEL PETKOVSEK/ Primary Examiner, Art Unit 2874	07 May 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office

Part of Paper No.: 20190506

AOI_NDCal 4-24cv09041_ 00002276

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/432,242	LUO et al.
	Examiner	Art Unit
	Daniel Petkovsek	2874

☑ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1														
2	2														
3	3														
	4														
4	5														
5	6														
6	7														
7	8														

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	7	
/DANIEL PETKOVSEK/ Primary Examiner, Art Unit 2874	07 May 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20190506

AOI_NDCal 4-24cv09041_ 00002277

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/432,242	LUO et al.
	Examiner	Art Unit
	Daniel Petkovsek	2874

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☑ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	08/18/2017	03/29/2018	09/07/2018	01/22/2019	05/07/2019				
1	1	✓	✓	✓	✓	=				
2	2	✓	✓	✓	✓	=				
3	3	✓	✓	✓	✓	=				
	4	✓	-	-	-	-				
4	5	✓	✓	✓	✓	=				
5	6	✓	✓	✓	✓	=				
6	7	✓	✓	✓	✓	=				
7	8		✓	✓	✓	=				

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	15432242
Filing Date	2017-02-14
First Named Inventor	LUO, Jian Hong
Art Unit	2874
Examiner Name	Petkovsek, Daniel
Attorney Docket Number	AOIC006

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6305848	B1	2001-10-23	GREGORY	
	2	7329054	B1	2008-02-12	EPITAUX ET AL	
	3	9482819	B2	2016-11-01	LI ET AL	
	4	9553671	B1	2017-01-24	NAGARAJAN ET AL	
	5	10088639	B2	2018-10-02	MENTOVICH ET AL	
	6	9476763	B2	2016-10-25	KACHRU ET AL	

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.P/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15432242
Filing Date	2017-02-14
First Named Inventor	LUO, Jian Hong
Art Unit	2874
Examiner Name	Petkovsek, Daniel
Attorney Docket Number	AOIC006

	1	20120301152	A1	2012-11-29	EDWARDS ET AL	
	2	20150316732	A1	2015-11-05	SCHAMUHN ET AL	
	3	20160131854	A1	2016-05-12	DE JONG	
	4	20170248763	A1	2017-08-31	KAWAMURA ET AL	
	5	20150256259	A1	2015-09-10	HUANG ET AL	
	6	20190018206	A1	2019-01-17	LUO ET AL	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

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Receipt date: 04/29/2019

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15432242
	Filing Date	2017-02-14
	First Named Inventor	LUO, Jian Hong
	Art Unit	2874
	Examiner Name	Petkovsek, Daniel
	Attorney Docket Number	AOIC006

	1	US Office Action mailed March 18, 2019, received in related Application No. 15/971,621, 17 pgs.
	2	US Office Action mailed April 16, 2019, received in related Application No. 16/142,466, 23 pgs.

If you wish to add additional non-patent literature document citation information please click the Add button [Add]

EXAMINER SIGNATURE

Examiner Signature	/DANIEL PETKOVSEK/	Date Considered	05/07/2019

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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BIB DATA SHEET

CONFIRMATION NO. 2079

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
15/432,242	02/14/2017	385	2874	AOIC006

APPLICANTS
Global Technology Inc., Ningbo, CHINA;

INVENTORS
Jian-Hong LUO, Ningbo, CHINA;
Dong-Biao JIANG, Ningbo, CHINA;
Peng NIE, Ningbo, CHINA;
Xiao-Liang DING, Ningbo, CHINA;

**** CONTINUING DATA ***************************

**** FOREIGN APPLICATIONS ***************************
CHINA 2016103460078 05/23/2016

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****
02/22/2017

Foreign Priority claimed ☑ Yes ☐ No 35 USC 119(a-d) conditions met ☑ Yes ☐ No Verified and Acknowledged /DANIEL PETKOVSEK/ Examiner's Signature	☐ Met after Allowance DJP Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		CHINA	6	7	~~1~~ 2

ADDRESS

APPLIED OPTOELECTRONICS, INC.
13115 JESS PIRTLE BLVD.
SUGAR LAND, TX 77478
UNITED STATES

TITLE

MULTI-CHANNEL PARALLEL OPTICAL RECEIVING DEVICE

FILING FEE RECEIVED		
1600	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

BIB (Rev. 05/07).

AOI_NDCal 4-24cv09041_ 00002282

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	6	(("20120301152") or ("20150316732") or ("20160131854") or ("20170248763") or ("20150256259") or ("20190018206")).PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/07 12:16
L1	8	(("6715936") or ("6305848") or ("7329054") or ("9482819") or ("9553671") or ("10088639") or ("9476763")).PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/07 12:14
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S267	0	(15/162623).APP.	USPAT; USOCR	OR	ON	2019/05/06 13:47
S266	1	("2016/0349451").URPN.	USPAT	OR	ON	2019/05/06 13:47
S265	0	("2017/0336582").URPN.	USPAT	OR	ON	2019/05/06 13:47
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			USOCR; JPO			
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S257	4	S256 and (degree$3 near2 ("41" "42" "43"))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
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S255	18	("20030067676" | "20080138013" | "20110142395" | "20150087092" | "7162124" | "7366380" | "7900836" | "8064745" | "8213751" | "8317411" | "8615149" | "8639073" | "9054489").PN. OR ("9341786").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/06 13:47
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		$ or US-20160149662-$ or US-20040022490-$ or US-20020181890-$ or US-20170168252-$ or US-20160349451-$ or US-20150311669-$ or US-20040161186-$ or US-20170336582-$ or US-20170307819-$).did. or (US-6945708-$ or US-9341786-$).did. or (US-20170168252-$ or US-20160349451-$).did.	PGPUB; USPAT; DERWENT			13:47
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S251	7	(("20030174964") or ("20040161186") or ("20160149662") or ("20160349451") or ("20170168252") or ("20150249501") or ("20170307819")).PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S250	6	(("5617234") or ("7376308") or ("8831433") or ("7058263") or ("7532783") or ("7941053")).PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S249	1	("20160349451").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S248	0	(15/162623).APP.	USPAT; USOCR	OR	ON	2019/05/06 13:47
S247	1	("2016/0349451").URPN.	USPAT	OR	ON	2019/05/06 13:47
S246	0	("2017/0336582").URPN.	USPAT	OR	ON	2019/05/06 13:47
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S242	1	("20160349451").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S241	13	(US-20010055444-$ or US-20150029572-	US-	OR	ON	2019/05/06

		$ or US-20160149662-$ or US-20040022490-$ or US-20020181890-$ or US-20170168252-$ or US-20160349451-$ or US-20150311669-$ or US-20040161186-$).did. or (US-6945708-$ or US-9341786-$).did. or (US-20170168252-$ or US-20160349451-$).did.	PGPUB; USPAT; DERWENT			13:47
S240	3	(luo$2 jiang$2 nie$2 ding$2).in. and (parallel$4 with receiv$4 with optic$4) and ("AWG" (array$3 near2 waveguid$3 near3 grating$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S239	107	S238 and (("AWG" (array$3 near2 waveguid$3 near3 grating$4)) with (reflect$4 mirror$4) with (detect$4 diod$4 photo-detect$4 photodetect$4 photo-diod$4 photodiod$4 receiv$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S238	17634	G02B6/32.cpc. or G02B6/12019.cpc. or G02B6/4214.cpc. or G02B6/4249.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S237	1	(10/368195).APP.	USPAT; USOCR	OR	ON	2019/05/06 13:47
S236	5	("2004/0161186").URPN.	USPAT	OR	ON	2019/05/06 13:47
S235	2	("2017/0168252").URPN.	USPAT	OR	ON	2019/05/06 13:47
S234	1	("20170168252").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S233	1	("20160149662").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S232	1	("2016/0349451").URPN.	USPAT	OR	ON	2019/05/06 13:47
S231	0	(15/162623).APP.	USPAT; USOCR	OR	ON	2019/05/06 13:47
S230	0	(15/373991).APP.	USPAT; USOCR	OR	ON	2019/05/06 13:47
S229	2	("2017/0168252").URPN.	USPAT	OR	ON	2019/05/06 13:47
S228	54	G02B6/4214.cpc. and G02B6/12019.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S227	5	("2016/0149662").URPN.	USPAT	OR	ON	2019/05/06 13:47

S226	1	(14/621273).APP.	USPAT; USOCR	OR	ON	2019/05/06 13:47
S225	12	("20010055444" | "6490395").PN. OR ("6760521").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/06 13:47
S224	15	petkovsek$2.xa,xp. and (fiber$4 with ("AWG" or (array$3 near3 grating$3)))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S223	127	coupl$4 same ("AWG" (array$2 near2 waveguid$3 near2 grating$4)) same (optic$4 near9 fiber$4) same connector$4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S222	1	("6715936").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S221	1	("20160349451").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S220	13	(US-20010055444-$ or US-20150029572-$ or US-20160149662-$ or US-20040022490-$ or US-20020181890-$ or US-20170168252-$ or US-20160349451-$ or US-20150311669-$ or US-20040161186-$).did. or (US-6945708-$ or US-9341786-$).did. or (US-20170168252-$ or US-20160349451-$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2019/05/06 13:47
S219	3	(luo$2 jiang$2 nie$2 ding$2).in. and (parallel$4 with receiv$4 with optic$4) and ("AWG" (array$3 near2 waveguid$3 near3 grating$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S218	107	S217 and (("AWG" (array$3 near2 waveguid$3 near3 grating$4)) with (reflect$4 mirror$4) with (detect$4 diod$4 photo-detect$4 photodetect$4 photo-diod$4 photodiod$4 receiv$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S217	17634	G02B6/32.cpc. or G02B6/12019.cpc. or G02B6/4214.cpc. or G02B6/4249.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S216	1	(10/368195).APP.	USPAT; USOCR	OR	ON	2019/05/06 13:47
S215	5	("2004/0161186").URPN.	USPAT	OR	ON	2019/05/06 13:47
S214	2	("2017/0168252").URPN.	USPAT	OR	ON	2019/05/06

						13:47
S213	1	("20170168252").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S212	1	("20160149662").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S211	1	("2016/0349451").URPN.	USPAT	OR	ON	2019/05/06 13:47
S210	0	(15/162623).APP.	USPAT; USOCR	OR	ON	2019/05/06 13:47
S209	0	(15/373991).APP.	USPAT; USOCR	OR	ON	2019/05/06 13:47
S208	2	("2017/0168252").URPN.	USPAT	OR	ON	2019/05/06 13:47
S207	54	G02B6/4214.cpc. and G02B6/12019.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S206	5	("2016/0149662").URPN.	USPAT	OR	ON	2019/05/06 13:47
S205	1	(14/621273).APP.	USPAT; USOCR	OR	ON	2019/05/06 13:47
S204	12	("20010055444" | "6490395").PN. OR ("6760521").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/06 13:47
S203	15	petkovsek$2.xa,xp. and (fiber$4 with ("AWG" or (array$3 near3 grating$3)))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S202	127	coupl$4 same ("AWG" (array$2 near2 waveguid$3 near2 grating$4)) same (optic$4 near9 fiber$4) same connector$4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S201	1	("6715936").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S200	1	("20160349451").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S199	1	("9341786").PN.	US-PGPUB; USPAT;	OR	OFF	2019/05/06 13:47

			USOCR; JPO			
S198	15	S197 and (angl$3 degree$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S197	19	(US-20010055444-$ or US-20150029572-$ or US-20160149662-$ or US-20040022490-$ or US-20020181890-$ or US-20170168252-$ or US-20160349451-$ or US-20150311669-$ or US-20040161186-$ or US-20170336582-$ or US-20170307819-$ or US-20110142395-$).did. or (US-6945708-$ or US-9341786-$ or US-7162124-$ or US-9484482-$ or US-9057844-$).did. or (US-20170168252-$ or US-20160349451-$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2019/05/06 13:47
S196	1	S195 and ("TIR" or internal$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S195	1	("7162124").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S194	4	S193 and (degree$3 near2 ("41" "42" "43"))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S193	66	("20020106156" | "20020146054" | "20030010904" | "20030081902" | "20040202428" | "20040240788" | "5488681" | "5657407" | "5724463" | "6136611" | "6289144" | "6697411").PN. OR ("7162124").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/06 13:47
S192	18	("20030067676" | "20080138013" | "20110142395" | "20150087092" | "7162124" | "7366380" | "7900836" | "8064745" | "8213751" | "8317411" | "8615149" | "8639073" | "9054489").PN. OR ("9341786").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/06 13:47
S191	1	("20160349451").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S190	15	(US-20010055444-$ or US-20150029572-$ or US-20160149662-$ or US-20040022490-$ or US-20020181890-$ or US-20170168252-$ or US-20160349451-$ or US-20150311669-$ or US-20040161186-$ or US-20170336582-$ or US-20170307819-$).did. or (US-	US-PGPUB; USPAT; DERWENT	OR	ON	2019/05/06 13:47

		6945708-$ or US-9341786-$).did. or (US-20170168252-$ or US-20160349451-$).did.				
S189	1	("7532783").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S188	7	(("20030174964") or ("20040161186") or ("20160149662") or ("20160349451") or ("20170168252") or ("20150249501") or ("20170307819")).PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S187	6	(("5617234") or ("7376308") or ("8831433") or ("7058263") or ("7532783") or ("7941053")).PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S186	1	("20160349451").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S185	0	(15/162623).APP.	USPAT; USOCR	OR	ON	2019/05/06 13:47
S184	1	("2016/0349451").URPN.	USPAT	OR	ON	2019/05/06 13:47
S183	0	("2017/0336582").URPN.	USPAT	OR	ON	2019/05/06 13:47
S182	1	("20170336582").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S181	1	("20170336852").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S180	13	(US-20010055444-$ or US-20150029572-$ or US-20160149662-$ or US-20040022490-$ or US-20020181890-$ or US-20170168252-$ or US-20160349451-$ or US-20150311669-$ or US-20040161186-$).did. or (US-6945708-$ or US-9341786-$).did. or (US-20170168252-$ or US-20160349451-$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2019/05/06 13:47
S179	1	("20160349451").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S178	13	(US-20010055444-$ or US-20150029572-$ or US-20160149662-$ or US-20040022490-$ or US-20020181890-$ or US-20170168252-$ or US-20160349451-$ or US-20150311669-$ or US-20040161186-$).did. or (US-6945708-$ or US-9341786-$).did. or (US-	US-PGPUB; USPAT; DERWENT	OR	ON	2019/05/06 13:47

		20170168252-$ or US-20160349451-$).did.				
S177	3	(luo$2 jiang$2 nie$2 ding$2).in. and (parallel$4 with receiv$4 with optic$4) and ("AWG" (array$3 near2 waveguid$3 near3 grating$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S176	107	S175 and (("AWG" (array$3 near2 waveguid$3 near3 grating$4)) with (reflect$4 mirror$4) with (detect$4 diod$4 photo-detect$4 photodetect$4 photo-diod$4 photodiod$4 receiv$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S175	17634	G02B6/32.cpc. or G02B6/12019.cpc. or G02B6/4214.cpc. or G02B6/4249.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S174	1	(10/368195).APP.	USPAT; USOCR	OR	ON	2019/05/06 13:47
S173	5	("2004/0161186").URPN.	USPAT	OR	ON	2019/05/06 13:47
S172	2	("2017/0168252").URPN.	USPAT	OR	ON	2019/05/06 13:47
S171	1	("20170168252").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S170	1	("20160149662").PN.	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2019/05/06 13:47
S169	1	("2016/0349451").URPN.	USPAT	OR	ON	2019/05/06 13:47
S168	0	(15/162623).APP.	USPAT; USOCR	OR	ON	2019/05/06 13:47
S167	0	(15/373991).APP.	USPAT; USOCR	OR	ON	2019/05/06 13:47
S166	2	("2017/0168252").URPN.	USPAT	OR	ON	2019/05/06 13:47
S165	54	G02B6/4214.cpc. and G02B6/12019.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/06 13:47
S164	5	("2016/0149662").URPN.	USPAT	OR	ON	2019/05/06 13:47
S163	1	(14/621273).APP.	USPAT; USOCR	OR	ON	2019/05/06 13:47
S162	12	("20010055444" | "6490395").PN. OR ("6760521").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/06 13:47