

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
 Stylesheet Version v1.2

EPAS ID: PAT7649116

SUBMISSION TYPE:	NEW ASSIGNMENT	
NATURE OF CONVEYANCE:	RELEASE OF SECURITY INTEREST	
CONVEYING PARTY DATA		
Name		Execution Date
TRUIST BANK (FORMERLY KNOWN AS BRANCH BANKING AND TRUST COMPANY))		11/16/2022
RECEIVING PARTY DATA		
Name:	APPLIED OPTOELECTRONICS, INC.	
Street Address:	13139 JESS PIRTLE BLVD.	
City:	SUGAR LAND	
State/Country:	TEXAS	
Postal Code:	77478	
PROPERTY NUMBERS Total: 109		
Property Type	Number	
Patent Number:	9703054	
Patent Number:	9698567	
Patent Number:	9696503	
Patent Number:	9685757	
Patent Number:	9684141	
Patent Number:	9671582	
Patent Number:	9614620	
Patent Number:	9606145	
Patent Number:	9523826	
Patent Number:	9509433	
Patent Number:	9502858	
Patent Number:	9479280	
Patent Number:	9479259	
Patent Number:	9455782	
Patent Number:	9448372	
Patent Number:	9448367	
Patent Number:	9432122	
Patent Number:	9356422	
Patent Number:	9343870	
Patent Number:	9341774	

ACCELIGHT-1002
 IPR2026-00019

Property Type	Number
Patent Number:	9306671
Patent Number:	9236949
Patent Number:	9236945
Patent Number:	9225428
Patent Number:	9214790
Patent Number:	9191111
Patent Number:	9170383
Patent Number:	9160455
Patent Number:	9083468
Patent Number:	9039303
Patent Number:	9002214
Patent Number:	8995484
Patent Number:	8899846
Patent Number:	8891974
Patent Number:	8831433
Patent Number:	8818208
Patent Number:	8805191
Patent Number:	8787772
Patent Number:	8718489
Patent Number:	8670675
Patent Number:	8655183
Patent Number:	8606116
Patent Number:	8406631
Patent Number:	8358937
Patent Number:	8320773
Patent Number:	8165475
Patent Number:	8165474
Patent Number:	8126329
Patent Number:	8121493
Patent Number:	8121170
Patent Number:	8091876
Patent Number:	8079222
Patent Number:	8073340
Patent Number:	8055138
Patent Number:	8045164
Patent Number:	7978985
Patent Number:	7925170
Patent Number:	7766686

Property Type	Number
Patent Number:	7627012
Patent Number:	7583719
Patent Number:	7573923
Patent Number:	7542503
Patent Number:	7519260
Patent Number:	7478955
Patent Number:	7468286
Patent Number:	7226218
Patent Number:	7026178
Patent Number:	7010013
Patent Number:	7010012
Patent Number:	6859481
Patent Number:	6795478
Patent Number:	6788466
Patent Number:	6782019
Patent Number:	6765948
Patent Number:	6765939
Patent Number:	6763053
Patent Number:	6763046
Patent Number:	6746777
Patent Number:	6736550
Patent Number:	6735224
Patent Number:	6724796
Patent Number:	6697413
Patent Number:	6696307
Patent Number:	6669367
Patent Number:	6652707
Patent Number:	6638773
Patent Number:	6636544
Patent Number:	6611543
Patent Number:	6608855
Patent Number:	6603184
Patent Number:	6560265
Patent Number:	6560259
Patent Number:	6549556
Patent Number:	6455908
Patent Number:	6406795
Patent Number:	6263002

Property Type	Number
Patent Number:	7290943
Application Number:	13916652
Application Number:	14295459
Application Number:	14551353
Application Number:	14590456
Application Number:	14661772
Application Number:	14665639
Application Number:	14837993
Application Number:	14838017
Application Number:	14974492
Application Number:	14983773
Application Number:	15204174
Application Number:	15241979

CORRESPONDENCE DATA

Fax Number: (404)522-8409

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Phone: 404-523-5300

Email: sls@phrd.com

Correspondent Name: STEVE SCHAAF

Address Line 1: PARKER, HUDSON, RAINER & DOBBS LLP

Address Line 2: 303 PEACHTREE STREET, SUITE 3600

Address Line 4: ATLANTA, GEORGIA 30308

ATTORNEY DOCKET NUMBER:	676.221
NAME OF SUBMITTER:	KATHLEEN O. CURREY
SIGNATURE:	/KOC/
DATE SIGNED:	11/16/2022
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 12

source=Release of Security Interest in Patents (Applied Optoelectronics)#page1.tif
source=Release of Security Interest in Patents (Applied Optoelectronics)#page2.tif
source=Release of Security Interest in Patents (Applied Optoelectronics)#page3.tif
source=Release of Security Interest in Patents (Applied Optoelectronics)#page4.tif
source=Release of Security Interest in Patents (Applied Optoelectronics)#page5.tif
source=Release of Security Interest in Patents (Applied Optoelectronics)#page6.tif
source=Release of Security Interest in Patents (Applied Optoelectronics)#page7.tif
source=Release of Security Interest in Patents (Applied Optoelectronics)#page8.tif
source=Release of Security Interest in Patents (Applied Optoelectronics)#page9.tif
source=Release of Security Interest in Patents (Applied Optoelectronics)#page10.tif
source=Release of Security Interest in Patents (Applied Optoelectronics)#page11.tif

RELEASE OF SECURITY INTEREST IN PATENTS

November 16, 2022

FOR VALUE RECEIVED, the undersigned, **TRUIST BANK**, a North Carolina banking corporation formerly known as Branch Banking and Trust Company, having an address at 333 Clay Street, Suite 3800, Houston, Texas 77002 ("Lender"), hereby releases and terminates all of Lender's liens and security interests in and to all Patent Collateral of **APPLIED OPTOELECTRONICS, INC.**, a Delaware corporation having a mailing address at 13139 Jess Pirtle Blvd., Sugar Land, Texas 77478 (the "Company"), including, without limitation, all of the patents and patent applications listed on Exhibit A attached hereto, and Lender hereby reassigns all right, title and interest (if any) that Lender may have in the Patent Collateral to Company, **without any representation or warranty by, or recourse to**, Lender, arising under that certain Patent Security Agreement between Lender and Company dated as of September 28, 2017, as recorded in the United States Patent and Trademark Office on September 29, 2017, at Reel 044061 Frame 0812 (the "Patent Security Agreement"). Capitalized terms used herein, unless otherwise defined herein, shall have the meanings ascribed to such terms in the Patent Security Agreement.

This Release of Security Interest in Patents (this "Release") is intended to operate as a release of all liens and security interests granted and conveyed by Company to Lender pursuant to the terms of the Patent Security Agreement and to reassign to Company all of Lender's right, title, and interest, if any, acquired pursuant to the terms of such Patent Security Agreement, in each case without any representation, warranty, recourse or undertaking by Lender.

[Remainder of page intentionally left blank;
signature appears on the following page]

IN WITNESS WHEREOF, Lender has caused this Release to be signed by its duly authorized officer on the date first written above.

TRUIST BANK

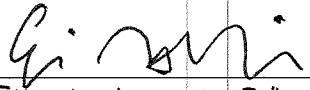
By: 
Name: Elizabeth H. Riley
Title: Vice President

EXHIBIT A

U.S. Patents and Patent Applications

<u>Patent Name</u>	<u>Registration/Application Number</u>	<u>Registration/Application Date</u>
Aligning and directly optically coupling photodetectors to optical demultiplexer outputs in a multichannel receiver optical subassembly	9,703,054	July 11, 2017
Wavelength-selectable laser device providing spatially-selectable wavelength(S)	9,698,567	July 4, 2017
Multi-channel transmitter optical subassembly (TOSA) with an optical coupling receptacle providing an off-center fiber	9,696,503	July 4, 2017
System, method and fixture for performing both optical power and wavelength measurements of light emitted from a laser diode	9,685,757	June 20, 2017
Techniques for reducing ingress of foreign matter into an optical subassembly	9,684,141	June 20, 2017
Pluggable optical transceiver module	9,671,582	June 6, 2017
Coaxial transmitter optical subassembly (TOSA) with cuboid type to laser package and optical transceiver including same	9,614,620	April 4, 2017
Test fixture with thermoelectric cooler and spring-operated holding pin	9,606,145	March 28, 2017
Pluggable optical transceiver module	9,523,826	December 20, 2016
Aligning and directly optically coupling photodetectors to	9,509,433	November 29, 2016

<u>Patent Name</u>	<u>Registration/Application Number</u>	<u>Registration/Application Date</u>
optical demultiplexer outputs in a multichannel receiver optical subassembly		
Laser array mux assembly with external reflector for providing a selected wavelength or multiplexed wavelengths	9,502,858	November 22, 2016
Extended cavity fabry-perot laser assembly capable of high speed optical modulation with narrow mode spacing and WDM optical system including same	9,479,280	October 25, 2016
Multi-channel optical transceiver module including thermal arrayed waveguide grating multiplexer and athermal arrayed waveguide grating demultiplexer	9,479,259	October 25, 2016
Monitoring a multiplexed laser array in an optical communication system	9,455,782	September 27, 2016
Optical coupling element and optical module having the same	9,448,372	September 20, 2016
Multi-channel optical transceiver module including dual fiber type direct link adapter for optically coupling optical subassemblies in the transceiver module	9,448,367	September 20, 2016
Optical networking unit (ONU) packaging	9,432,122	August 30, 2016
Scribe etch process for semiconductor laser chip manufacturing	9,356,422	May 31, 2016
Semiconductor laser diode with integrated heating region	9,343,870	May 17, 2016
Optically matched laser array coupling assembly for coupling laser array to arrayed waveguide grating	9,341,774	May 17, 2016

<u>Patent Name</u>	<u>Registration/Application Number</u>	<u>Registration/Application Date</u>
Thermally isolated multi-channel transmitter optical subassembly and optical transceiver module including same	9,306,671	April 5, 2016
Laser transceiver with improved bit error rate	9,236,949	January 12, 2016
Thermally shielded multi-channel transmitter optical subassembly and optical transceiver module including same	9,236,945	January 12, 2016
Method and system for alignment of photodetector array to optical demultiplexer outputs	9,225,428	December 29, 2015
Filtered laser array assembly with external optical modulation and WDM optical system including same	9,214,790	December 15, 2015
Reducing cross-modulation in multichannel modulated optical systems	9,191,111	November 17, 2015
Multi-channel optical transceiver module including dual fiber type direct link adapter for optically coupling optical subassemblies in the transceiver module	9,170,383	October 27, 2015
External cavity laser array system and WDM optical system including same	9,160,455	October 13, 2015
Heated laser package with increased efficiency for optical transmitter systems	9,083,468	July 14, 2015
Compact multi-channel optical transceiver module	9,039,303	May 26, 2015
Wavelength-selectable laser device and apparatus and system including same	9,002,214	April 7, 2015

<u>Patent Name</u>	<u>Registration/Application Number</u>	<u>Registration/Application Date</u>
Temperature controlled multi-channel transmitter optical subassembly and optical transceiver module including same	8,995,484	March 31, 2015
Receptacle diplexer	8,899,846	December 2, 2014
Distortion compensation circuit including tunable phase path	8,891,974	November 18, 2014
Temperature controlled multi-channel transmitter optical subassembly and optical transceiver module including same	8,831,433	September 9, 2014
Laser mux assembly for providing a selected wavelength	8,818,208	August 26, 2014
Optical transceiver including optical fiber coupling assembly to increase usable channel wavelengths	8,805,191	August 12, 2014
Laser package including semiconductor laser and memory device for storing laser parameters	8,787,772	July 22, 2014
Distortion compensation circuit including one or more phase invertible distortion paths	8,718,489	May 6, 2014
System and method for distortion compensation including configureable delay	8,670,675	March 11, 2014
Optical transceiver that maintains a bend diameter of an internal optical fiber and method of assembling same	8,655,183	February 18, 2014
System and method for distortion compensation in response to frequency detection	8,606,116	December 10, 2013

<u>Patent Name</u>	<u>Registration/Application Number</u>	<u>Registration/Application Date</u>
Network timing	8,406,631	March 26, 2013
Systems and methods for reducing clipping in multichannel modulated optical systems	8,358,937	January 22, 2013
Reducing cross-modulation in multichannel modulated optical systems	8,320,773	November 27, 2012
Systems and methods for reducing clipping in multichannel modulated optical systems	8,165,475	April 24, 2012
Reducing cross modulation in multichannel modulated optical systems with anti-clipping	8,165,474	April 24, 2012
Quad-port optical module with pass-through and add/drop configuration	8,126,329	February 28, 2012
Distortion compensation circuit and method based on orders of time dependent series of distortion signal	8,121,493	February 21, 2012
Gain-coupled distributed feedback semiconductor laser including first-order and second-order gratings	8,121,170	February 21, 2012
Fixture for securing optoelectronic packages for wire and/or component bonding	8,091,876	January 10, 2012
Thermoelectric cooler controller	8,079,222	December 20, 2011
Distortion compensation circuit including one or more phase invertible distortion paths	8,073,340	December 6, 2011
Photosensor operating point	8,055,138	November 8, 2011

<u>Patent Name</u>	<u>Registration/Application Number</u>	<u>Registration/Application Date</u>
Position finding system and method for use in aligning laser device with an optical fiber	8,045,164	October 25, 2011
Clipping correction system and method for correcting clipped signals in a receiver	7,978,985	July 12, 2011
Predistortion circuit including distortion generator diodes with adjustable diode bias	7,925,170	April 12, 2011
Pluggable form factor release mechanism	7,766,686	August 3, 2010
Distributed feedback semiconductor laser including wavelength monitoring section	7,627,012	December 1, 2009
Complex-coupled distributed feedback semiconductor laser	7,583,719	September 1, 2009
Laser drive circuit and method providing high limit clipping corresponding to low limit clipping in a laser	7,573,923	August 11, 2009
Distributed feedback laser with improved optical field uniformity and mode stability	7,542,503	June 2, 2009
Coaxial optoelectronic device separation apparatus and method	7,519,260	April 14, 2009
Modular laser package system	7,478,955	January 20, 2009
System and method for securing optoelectronic packages for mounting components at a mounting angle	7,468,286	December 23, 2008
Method and apparatus for coupling a laser to a fiber in a two-lens laser system	7,226,218	June 5, 2007
Method for fabricating a VCSEL with ion-implanted current-confinement structure	7,026,178	April 11, 2006

<u>Patent Name</u>	<u>Registration/Application Number</u>	<u>Registration/Application Date</u>
Assembly with tapered, threaded ferrule housing for improved alignment of fiber with laser	7,010,013	March 7, 2006
Method and apparatus for reducing specular reflections in semiconductor lasers	7,010,012	March 7, 2006
Optically-pumped multiple-quantum well active region with improved distribution of optical pumping power	6,859,481	February 22, 2005
VCSEL with antiguide current confinement layer	6,795,478	September 21, 2004
Multiple reflectivity band reflector	6,788,466	September 7, 2004
VCSEL with heat-spreading layer	6,782,019	August 24, 2004
VCSEL assembly with edge-receiving optical devices	6,765,948	July 20, 2004
Multiple reflectivity band reflector with non-uniform profile and laser system employing same for laser wavelength monitoring	6,765,939	July 20, 2004
Laser having multiple reflectivity band reflector	6,763,053	July 13, 2004
Method and system employing multiple reflectivity band reflector for laser wavelength monitoring	6,763,046	July 13, 2004
Alternative substrates for epitaxial growth	6,746,777	June 8, 2004
Housing for passively aligning an optical fiber with a lens	6,736,550	May 18, 2004
Planar lightwave circuit for conditioning tunable laser output	6,735,224	May 11, 2004

<u>Patent Name</u>	<u>Registration/Application Number</u>	<u>Registration/Application Date</u>
Modified distributed bragg reflector (DBR) for vertical cavity surface-emitting laser (VCSEL) resonant wavelength tuning sensitivity control	6,724,796	April 20, 2004
Tunable vertical-cavity surface-emitting laser with tuning junction	6,697,413	February 24, 2004
Patterned phase shift layers for wavelength-selectable vertical cavity surface-emitting laser (VCSEL) arrays	6,696,307	February 24, 2004
Optical fiber with mirror for semiconductor laser	6,669,367	December 30, 2003
Method and apparatus for demounting workpieces from adhesive film	6,652,707	November 25, 2003
Method for fabricating single-mode DBR laser with improved yield	6,638,773	October 28, 2003
Overlapping wavelength-tunable vertical cavity surface-emitting laser (VCSEL) arrays	6,636,544	October 21, 2003
Vertical-cavity surface-emitting laser with metal mirror and method of fabrication of same	6,611,543	August 26, 2003
Single-mode DBR laser with improved phase-shift section	6,608,855	August 19, 2003
Double heterostructure photodiode with graded minority-carrier blocking structures	6,603,184	August 5, 2003
Method and apparatus for polarizing light in a VCSEL	6,560,265	May 6, 2003
Spatially coherent surface-emitting, grating coupled	6,560,259	May 6, 2003

<u>Patent Name</u>	<u>Registration/Application Number</u>	<u>Registration/Application Date</u>
quantum cascade laser with unstable resonance cavity		
Vertical-cavity surface-emitting laser with bottom dielectric distributed bragg reflector	6,549,556	April 15, 2003
Multispectral radiation detectors using strain-compensating superlattices	6,455,908	6,455,908 September 24, 2002
Compliant universal substrates for optoelectronic and electronic devices	6,406,795	June 18, 2002
Tunable fiber fabry-perot surface-emitting lasers	6,263,002	June 17, 2001
Modular laser package system and associated methods	7,290,943	November 6, 2007
Tunable laser with multiple in-line section	13/916,652	June 13, 2013
Monitoring nad controlling temperature across a laser array in a transmitter optical subassembly (TOSA) package	14/295,459	June 4, 2014
Tunable laser with multiple in-line section including sampled gratings	14/551,353	November 24, 2014
Two-section semiconductor laser with modulation-independent grating section to reduce chirp	14/590,456	January 6, 2015
Tunable laser including parallel lasing cavities with a common output	14/661,772	March 18, 2015
Multichannel receiver optical subassembly with improved sensitivity	14/665,639	March 23, 2015
Multi-channel transmitter optical subassembly (TOSA) with opposing placement of transistor outline (TO) can laser packages	14/837,993	August 27, 2015

<u>Patent Name</u>	<u>Registration/Application Number</u>	<u>Registration/Application Date</u>
Receiver optical subassembly (ROSA) housing with sidewall receptacle to provide electrical isolation between an adjacent transmitter optical subassembly (TOSA) in a transceiver housing	14/838,017	August 27, 2015
Optical filter sub-assembly cartridge for use in a receiver optical subassembly (ROSA) housing	14/974,492	December 18, 2015
Optical transceiver assembly including thermal dual arrayed waveguide grating	14/983,773	December 30, 2015
Techniques for reducing the footprint of a multi-channel transmitter optical subassembly (TOSA) within an optical transceiver housing	15/204,174	July 7, 2016
Optical component assembly having a keyed structure for ensuring proper insertion orientation within an optical subassembly	15/241,979	August 19, 2016

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
 Stylesheet Version v1.2

EPAS ID: PAT4620296

SUBMISSION TYPE:	NEW ASSIGNMENT	
NATURE OF CONVEYANCE:	SECURITY INTEREST	
CONVEYING PARTY DATA		
Name		Execution Date
APPLIED OPTOELECTRONICS, INC.		09/28/2017
RECEIVING PARTY DATA		
Name:	BRANCH BANKING AND TRUST COMPANY	
Street Address:	333 CLAY STREET	
Internal Address:	SUITE 3800	
City:	HOUSTON	
State/Country:	TEXAS	
Postal Code:	30303	
PROPERTY NUMBERS Total: 109		
Property Type	Number	
Patent Number:	9703054	
Patent Number:	9698567	
Patent Number:	9696503	
Patent Number:	9685757	
Patent Number:	9684141	
Patent Number:	9671582	
Patent Number:	9614620	
Patent Number:	9606145	
Patent Number:	9523826	
Patent Number:	9509433	
Patent Number:	9502858	
Patent Number:	9479280	
Patent Number:	9479259	
Patent Number:	9455782	
Patent Number:	9448372	
Patent Number:	9448367	
Patent Number:	9432122	
Patent Number:	9356422	
Patent Number:	9343870	

Property Type	Number
Patent Number:	9341774
Patent Number:	9306671
Patent Number:	9236949
Patent Number:	9236945
Patent Number:	9225428
Patent Number:	9214790
Patent Number:	9191111
Patent Number:	9170383
Patent Number:	9160455
Patent Number:	9083468
Patent Number:	9039303
Patent Number:	9002214
Patent Number:	8995484
Patent Number:	8899846
Patent Number:	8891974
Patent Number:	8831433
Patent Number:	8818208
Patent Number:	8805191
Patent Number:	8787772
Patent Number:	8718489
Patent Number:	8670675
Patent Number:	8655183
Patent Number:	8606116
Patent Number:	8406631
Patent Number:	8358937
Patent Number:	8320773
Patent Number:	8165475
Patent Number:	8165474
Patent Number:	8126329
Patent Number:	8121493
Patent Number:	8121170
Patent Number:	8091876
Patent Number:	8079222
Patent Number:	8073340
Patent Number:	8055138
Patent Number:	8045164
Patent Number:	7978985
Patent Number:	7925170

Property Type	Number
Patent Number:	7766686
Patent Number:	7627012
Patent Number:	7583719
Patent Number:	7573923
Patent Number:	7542503
Patent Number:	7519260
Patent Number:	7478955
Patent Number:	7468286
Patent Number:	7226218
Patent Number:	7026178
Patent Number:	7010013
Patent Number:	7010012
Patent Number:	6859481
Patent Number:	6795478
Patent Number:	6788466
Patent Number:	6782019
Patent Number:	6765948
Patent Number:	6765939
Patent Number:	6763053
Patent Number:	6763046
Patent Number:	6746777
Patent Number:	6736550
Patent Number:	6735224
Patent Number:	6724796
Patent Number:	6697413
Patent Number:	6696307
Patent Number:	6669367
Patent Number:	6652707
Patent Number:	6638773
Patent Number:	6636544
Patent Number:	6611543
Patent Number:	6608855
Patent Number:	6603184
Patent Number:	6560265
Patent Number:	6560259
Patent Number:	6549556
Patent Number:	6455908
Patent Number:	6406795

Property Type	Number
Patent Number:	6263002
Patent Number:	7290943
Application Number:	13916652
Application Number:	14295459
Application Number:	14551353
Application Number:	14590456
Application Number:	14661772
Application Number:	14665639
Application Number:	14837993
Application Number:	14838017
Application Number:	14974492
Application Number:	14983773
Application Number:	15204174
Application Number:	15241979

CORRESPONDENCE DATA

Fax Number: (404)522-8409

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Phone: 404-681-5974

Email: bxha@phrd.com

Correspondent Name: BARBARA XHAJANKA

Address Line 1: 303 PEACHTREE STREET, NE

Address Line 2: SUITE 3600

Address Line 4: ATLANTA, GEORGIA 30303

NAME OF SUBMITTER:	KELLEY C. GASS
SIGNATURE:	/KCG/
DATE SIGNED:	09/29/2017
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 15

source=Applied Optoelectronics, Inc - Patent Security Agreement#page1.tif
source=Applied Optoelectronics, Inc - Patent Security Agreement#page2.tif
source=Applied Optoelectronics, Inc - Patent Security Agreement#page3.tif
source=Applied Optoelectronics, Inc - Patent Security Agreement#page4.tif
source=Applied Optoelectronics, Inc - Patent Security Agreement#page5.tif
source=Applied Optoelectronics, Inc - Patent Security Agreement#page6.tif
source=Applied Optoelectronics, Inc - Patent Security Agreement#page7.tif
source=Applied Optoelectronics, Inc - Patent Security Agreement#page8.tif
source=Applied Optoelectronics, Inc - Patent Security Agreement#page9.tif
source=Applied Optoelectronics, Inc - Patent Security Agreement#page10.tif
source=Applied Optoelectronics, Inc - Patent Security Agreement#page11.tif

source=Applied Optoelectronics, Inc - Patent Security Agreement#page12.tif
source=Applied Optoelectronics, Inc - Patent Security Agreement#page13.tif
source=Applied Optoelectronics, Inc - Patent Security Agreement#page14.tif
source=Applied Optoelectronics, Inc - Patent Security Agreement#page15.tif

PATENT SECURITY AGREEMENT

This **PATENT SECURITY AGREEMENT** (this "Agreement") is made as of this 28th day of September, 2017, between **BRANCH BANKING AND TRUST COMPANY**, a North Carolina banking corporation (together with its successors and assigns, "Lender"), and **APPLIED OPTOELECTRONICS, INC.**, a Delaware corporation ("Company").

Recitals:

Company desires to obtain loans and other financial accommodations from Lender pursuant to that certain Loan Agreement dated the date hereof (as at any time amended, restated, supplemented or otherwise modified, the "Loan Agreement") by and between Company and Lender.

Lender is willing to make loans and other financial accommodations to Company from time to time pursuant to the terms of the Loan Agreement, provided that, among other things, Company executes this Agreement.

NOW, THEREFORE, for Ten Dollars (\$10.00) in hand paid and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Company hereby agrees with Lender as follows:

1. Capitalized terms used herein (including those used in the Recitals hereto), unless otherwise defined, shall have the meanings ascribed to them in the Loan Agreement. As used herein, the term "Full Payment" shall mean full and final payment of the Obligations (as defined in the Security Agreement) (hereinafter, the "Obligations") and termination of Lender's financing arrangements with Company; and the term "UCC" shall mean the Uniform Commercial Code as in effect from time to time in the State of Texas.

2. To secure the prompt payment and performance of all of the Obligations, Company hereby grants, assigns and pledges to Lender, a continuing security interest in and Lien upon all of the following property of Company, whether now existing or hereafter created or acquired (the "Patent Collateral");

(a) the entire right, title and interest of Company in and to the patent applications and patents listed in Exhibit A attached hereto (as the same may be amended from time to time), and all re-issues, divisions, continuations, renewals, extensions and continuations-in-part thereof, including, without limitation, the right to sue for past, present and future infringements and rights corresponding thereto throughout the world (all of the foregoing being herein collectively referred to as the "Patents"); and

(b) all proceeds of the foregoing (such as, by way of example, license royalties and proceeds of infringement suits).

3. Company covenants with and warrants to Lender that:

(a) The Patents are subsisting and have not been adjudged invalid or unenforceable, in whole or in part;

(b) Company is now and shall continue to be the sole and exclusive owner of the entire and unencumbered right, title and interest in and to each of the Patents, free and clear of any Liens;

(c) Company has the unqualified right to enter into this Agreement and perform its terms; and

(d) Company has used, and will continue to use for the duration of this Agreement, proper statutory notice in connection with its use of the Patents and has made, and will continue to make all appropriate filings with the United States Patent and Trademark Office and any applicable foreign filing offices to maintain the Patents in existence, including, without limitation, filing all necessary documents with the United States Patent and Trademark Office and any applicable foreign filing offices for each Patent to maintain it without loss of protection therefor.

4. Until Full Payment of all of the Obligations, Company shall not enter into any license agreement relating to any of the Patents with any Person except non-exclusive licenses to customers, vendors, suppliers, agents or other service providers of Company in the regular and ordinary course of Company's business as presently conducted and for reasonable and customary compensation, and shall not become a party to any agreement with any Person that is inconsistent with Company's obligations under this Agreement.

5. If, before Full Payment of all of the Obligations, Company shall obtain rights to any new patentable inventions, or become entitled to the benefit of any patent application or patent for any reissue, division, continuation, renewal, extension or continuation-in-part of any Patent or any improvement on any Patent, the provisions of paragraph 2 shall automatically apply thereto and Company shall give to Lender prompt notice thereof in writing.

6. Company irrevocably authorizes and empowers Lender to modify this Agreement by amending Exhibit A to include any future patents and patent applications under paragraph 2 or paragraph 5 hereof.

7. Company hereby grants to Lender and its employees the visitation, audit, and inspection rights with respect to Company and the Patent Collateral as set forth in Section DD.06(b) of Schedule DD to the Loan Agreement.

8. At any time that an Event of Default exists, Lender shall have, in addition to all other rights and remedies given it by this Agreement and the other Loan Documents, all rights and remedies of a secured party under the UCC and all other rights and remedies under applicable law. Without limiting the generality of the foregoing, Lender may immediately, without demand of performance and without other notice (except as described in the next sentence, if required by applicable law) or demand whatsoever to Company, each of which Company hereby expressly waives, and without advertisement (except as otherwise provided by applicable law), collect directly any payments due Company in respect of the Patent Collateral, or sell at public or private sale or otherwise realize upon the whole or from time to time any of the Patent Collateral, or any interest that Company may have therein. Company hereby agrees that ten (10) days notice to Company of any public or private sale or other disposition of any of the Patent Collateral shall be reasonable notice; provided, however, that no notice shall be required hereunder if not otherwise required by applicable law. At any such sale or disposition, Lender may, to the extent permitted by applicable law, purchase the whole or any part of the Patent Collateral sold, free from any right of redemption on the part of Company, which right Company hereby waives and releases. After deducting from the proceeds of such sale or other disposition of the Patent Collateral all reasonable costs and expenses incurred by Lender in enforcing its rights hereunder (including, without limitation, all reasonable attorneys' fees), Lender shall apply the remainder of such proceeds to the payment of the Obligations, in such order or manner as may be authorized or required by the Loan Agreement. Any remainder of the proceeds after Full Payment of all of the Obligations shall be paid over to Company. If any deficiency shall arise, Company shall remain liable therefor.

9. Company hereby makes, constitutes and appoints Lender, and any officer or agent of Lender as Lender may reasonably select, as Company's true and lawful attorney-in-fact, with full power to do any or all of the following if an Event of Default with respect to Company shall exist: to endorse Company's name on all applications, documents, papers and instruments necessary for Lender to continue the maintenance of or to use the Patents, or to grant or issue any exclusive or nonexclusive license under the Patents to any other Person, or to assign, pledge, convey or otherwise transfer title in or dispose of any Patent Collateral to any other Person. Company hereby ratifies all that such attorney shall lawfully do or cause to be done by virtue hereof. This power of attorney, being coupled with an interest, shall be irrevocable until Full Payment of all of the Obligations, upon which time such power of attorney will automatically terminate (unless sooner terminated by the parties).

10. Any and all reasonable fees, costs and expenses, of whatever kind or nature, (including, without limitation, reasonable attorneys' fees and legal expenses) incurred by Lender in connection with the preparation of this Agreement and any other documents relating hereto and the consummation of this transaction, the filing or recording of any documents (including, without limitation, all taxes in connection therewith) with the United States Patent and Trademark Office or in other public offices, the payment or discharge of any taxes, counsel fees, maintenance fees or Liens, or otherwise, in protecting, maintaining and preserving any Patent Collateral or in defending or prosecuting any actions or proceedings arising out of or related to any Patent Collateral, shall be borne and paid by Company (it being the intent of Company and Lender that Company shall be responsible for the payment of all sums, fees, costs and expenses, including, without limitation, all maintenance fees payable with respect to the Patents) or, if paid by Lender in its sole discretion, shall be reimbursed by Company to Lender **on demand** by Lender and until so paid shall be added to the principal amount of the Obligations and shall bear interest at the Default Rate then applicable to the Line of Credit.

11. Company shall use its commercially reasonable efforts to detect any infringers of the Patents and shall notify Lender in writing of material infringements detected. Company shall have the duty, through counsel reasonably acceptable to Lender, to prosecute diligently any patent application for a Patent pending as of the date of this Agreement or thereafter until Full Payment of all of the Obligations, to make application on unpatented but patentable inventions (subject to Company's reasonable discretion in the ordinary course of business, or, during the existence of an Event of Default, promptly upon Lender's request), to file and prosecute opposition and cancellation proceedings, to file and prosecute lawsuits to protect each Patent and to do any and all acts that are reasonably deemed necessary or desirable by Lender to preserve and maintain all rights in patent applications for each Patent, unless in any such case Company has determined that such Patent is no longer material to the conduct of its business.. Any expenses incurred in connection with such an application or proceedings shall be borne by Company. Company shall not abandon any pending patent application or Patent, without the prior written consent of Lender, unless Company has determined that such patent application or Patent is no longer material to the conduct of its business.

12. Notwithstanding anything to the contrary contained in paragraph 11 hereof, Lender shall have the right, at any time that an Event of Default exists, but shall in no way be obligated, to bring suit in its own name to enforce the Patents and any license hereunder, or to defend any suit or counterclaim in its own name to protect any Patents or license hereunder, in either of which events Company shall at the request of Lender do any and all lawful acts (including bringing suit) and execute any and all proper documents required by Lender in aid of such enforcement or defense and Company shall promptly, upon demand, reimburse and indemnify Lender for all reasonable costs and expenses incurred by Lender in the exercise of its rights under this paragraph 12.

13. If Company fails to comply with any of its obligations hereunder and at the time of such failure or as a result thereof an Event of Default exists, then to the extent permitted by applicable law,

Lender may discharge such obligations in Company's name or in Lender's name, in Lender's sole discretion, but at Company's expense, and Company agrees to reimburse Lender in full for all reasonable expenses, including, without limitation, reasonable attorneys' fees, incurred by Lender in prosecuting, defending or maintaining the Patents or Lender's interest therein pursuant to this Agreement.

14. No course of dealing between Company and Lender, nor any failure to exercise, nor any delay in exercising, on the part of Lender, any right, power or privilege hereunder or under any of the other Loan Documents shall operate as a waiver thereof; nor shall any single or partial exercise of any right, power or privilege hereunder or thereunder preclude any other or future exercise thereof or the exercise of any other right, power or privilege.

15. All of Lender's rights and remedies with respect to the Patent Collateral, whether established by this Agreement or any of the other Loan Documents, or by any other agreements or by applicable law, shall be cumulative and may be exercised singularly or concurrently.

16. The provisions of this Agreement are severable, and if any clause or provision shall be held invalid and unenforceable, in whole or in part, in any jurisdiction, the same shall be deemed severed herefrom and shall not in any manner affect such clause or provisions in any other jurisdiction, or any other clause or provision of this Agreement in any jurisdiction.

17. This Agreement, together with the other Loan Documents, constitutes and expresses the entire understanding of the parties hereto with respect to the subject matter hereof, and supersedes all prior agreements and understandings, inducements or conditions, whether express or implied, oral or written. This Agreement is subject to modification only by writing signed by the parties, except as provided in paragraph 6 hereof.

18. The benefits and burdens of this Agreement shall inure to the benefit of and be binding upon the successors and assigns of Lender and upon the successors and permitted assigns of Company. Company shall not assign its rights or delegate its rights or assign its duties hereunder without the prior written consent of Lender.

19. Company hereby waives notice of Lender's acceptance hereof.

20. This Agreement shall be governed by and construed in accordance with the internal laws of the State of Texas.

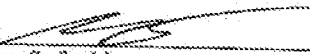
21. To the fullest extent permitted by applicable law, Company and Lender each waives the right to trial by jury in any action, suit, proceeding or counterclaim of any kind arising out of or related to this Agreement or the Patent Collateral.

22. Upon Full Payment, Lender shall execute and deliver to Company, at Company's request and at Company's expense, all releases, termination statements, and other instruments as may be necessary or proper to release or reflect the release of Lender's security interest in the Patent Collateral, including all documentation necessary to reflect such release in the United States Patent and Trademark Office.

[Remainder of page intentionally left blank; signatures appear on following pages.]

IN WITNESS WHEREOF, the parties hereto have executed this Agreement under seal as of the date first written above.

APPLIED OPTOELECTRONICS, INC.
("Company")

By: 
Name: Stefan Murry
Title: Chief Financial Officer

Accepted:

BRANCH BANKING AND TRUST
COMPANY
("Lender")

By: 
Name: Brandon E. Fitch
Title: SVP

EXHIBIT A

Patents

<u>Patent Name</u>	<u>Registration/Application Number</u>	<u>Registration/Application Date</u>
Aligning and directly optically coupling photodetectors to optical demultiplexer outputs in a multichannel receiver optical subassembly	9,703,054	July 11, 2017
Wavelength-selectable laser device providing spatially-selectable wavelength(S)	9,698,567	July 4, 2017
Multi-channel transmitter optical subassembly (TOSA) with an optical coupling receptacle providing an off-center fiber	9,696,503	July 4, 2017
System, method and fixture for performing both optical power and wavelength measurements of light emitted from a laser diode	9,685,757	June 20, 2017
Techniques for reducing ingress of foreign matter into an optical subassembly	9,684,141	June 20, 2017
Pluggable optical transceiver module	9,671,582	June 6, 2017
Coaxial transmitter optical subassembly (TOSA) with cuboid type to laser package and optical transceiver including same	9,614,620	April 4, 2017
Test fixture with thermoelectric cooler and spring-operated holding pin	9,606,145	March 28, 2017
Pluggable optical transceiver module	9,523,826	December 20, 2016

Aligning and directly optically coupling photodetectors to optical demultiplexer outputs in a multichannel receiver optical subassembly	9,509,433	November 29, 2016
Laser array mux assembly with external reflector for providing a selected wavelength or multiplexed wavelengths	9,502,858	November 22, 2016
Extended cavity fabry-perot laser assembly capable of high speed optical modulation with narrow mode spacing and WDM optical system including same	9,479,280	October 25, 2016
Multi-channel optical transceiver module including thermal arrayed waveguide grating multiplexer and athermal arrayed waveguide grating demultiplexer	9,479,259	October 25, 2016
Monitoring a multiplexed laser array in an optical communication system	9,455,782	September 27, 2016
Optical coupling element and optical module having the same	9,448,372	September 20, 2016
Multi-channel optical transceiver module including dual fiber type direct link adapter for optically coupling optical subassemblies in the transceiver module	9,448,367	September 20, 2016
Optical networking unit (ONU) packaging	9,432,122	August 30, 2016
Scribe etch process for semiconductor laser chip manufacturing	9,356,422	May 31, 2016
Semiconductor laser diode with integrated heating region	9,343,870	May 17, 2016
Optically matched laser array coupling assembly for coupling laser array to arrayed waveguide grating	9,341,774	May 17, 2016

Thermally isolated multi-channel transmitter optical subassembly and optical transceiver module including same	9,306,671	April 5, 2016
Laser transceiver with improved bit error rate	9,236,949	January 12, 2016
Thermally shielded multi-channel transmitter optical subassembly and optical transceiver module including same	9,236,945	January 12, 2016
Method and system for alignment of photodetector array to optical demultiplexer outputs	9,225,428	December 29, 2015
Filtered laser array assembly with external optical modulation and WDM optical system including same	9,214,790	December 15, 2015
Reducing cross-modulation in multichannel modulated optical systems	9,191,111	November 17, 2015
Multi-channel optical transceiver module including dual fiber type direct link adapter for optically coupling optical subassemblies in the transceiver module	9,170,383	October 27, 2015
External cavity laser array system and WDM optical system including same	9,160,455	October 13, 2015
Heated laser package with increased efficiency for optical transmitter systems	9,083,468	July 14, 2015
Compact multi-channel optical transceiver module	9,039,303	May 26, 2015
Wavelength-selectable laser device and apparatus and system including same	9,002,214	April 7, 2015

Temperature controlled multi-channel transmitter optical subassembly and optical transceiver module including same	8,995,484	March 31, 2015
Receptacle diplexer	8,899,846	December 2, 2014
Distortion compensation circuit including tunable phase path	8,891,974	November 18, 2014
Temperature controlled multi-channel transmitter optical subassembly and optical transceiver module including same	8,831,433	September 9, 2014
Laser mux assembly for providing a selected wavelength	8,818,208	August 26, 2014
Optical transceiver including optical fiber coupling assembly to increase usable channel wavelengths	8,805,191	August 12, 2014
Laser package including semiconductor laser and memory device for storing laser parameters	8,787,772	July 22, 2014
Distortion compensation circuit including one or more phase invertible distortion paths	8,718,489	May 6, 2014
System and method for distortion compensation including configureable delay	8,670,675	March 11, 2014
Optical transceiver that maintains a bend diameter of an internal optical fiber and method of assembling same	8,655,183	February 18, 2014
System and method for distortion compensation in response to frequency detection	8,606,116	December 10, 2013
Network timing	8,406,631	March 26, 2013

Systems and methods for reducing clipping in multichannel modulated optical systems	8,358,937	January 22, 2013
Reducing cross-modulation in multichannel modulated optical systems	8,320,773	November 27, 2012
Systems and methods for reducing clipping in multichannel modulated optical systems	8,165,475	April 24, 2012
Reducing cross modulation in multichannel modulated optical systems with anti-clipping	8,165,474	April 24, 2012
Quad-port optical module with pass-through and add/drop configuration	8,126,329	February 28, 2012
Distortion compensation circuit and method based on orders of time dependent series of distortion signal	8,121,493	February 21, 2012
Gain-coupled distributed feedback semiconductor laser including first-order and second-order gratings	8,121,170	February 21, 2012
Fixture for securing optoelectronic packages for wire and/or component bonding	8,091,876	January 10, 2012
Thermoelectric cooler controller	8,079,222	December 20, 2011
Distortion compensation circuit including one or more phase invertible distortion paths	8,073,340	December 6, 2011
Photosensor operating point	8,055,138	November 8, 2011
Position finding system and method for use in aligning laser device with an optical fiber	8,045,164	October 25, 2011

Clipping correction system and method for correcting clipped signals in a receiver	7,978,985	July 12, 2011
Predistortion circuit including distortion generator diodes with adjustable diode bias	7,925,170	April 12, 2011
Pluggable form factor release mechanism	7,766,686	August 3, 2010
Distributed feedback semiconductor laser including wavelength monitoring section	7,627,012	December 1, 2009
Complex-coupled distributed feedback semiconductor laser	7,583,719	September 1, 2009
Laser drive circuit and method providing high limit clipping corresponding to low limit clipping in a laser	7,573,923	August 11, 2009
Distributed feedback laser with improved optical field uniformity and mode stability	7,542,503	June 2, 2009
Coaxial optoelectronic device separation apparatus and method	7,519,260	April 14, 2009
Modular laser package system	7,478,955	January 20, 2009
System and method for securing optoelectronic packages for mounting components at a mounting angle	7,468,286	December 23, 2008
Method and apparatus for coupling a laser to a fiber in a two-lens laser system	7,226,218	June 5, 2007
Method for fabricating a VCSEL with ion-implanted current-confinement structure	7,026,178	April 11, 2006
Assembly with tapered, threaded ferrule housing for improved alignment of fiber with laser	7,010,013	March 7, 2006

Method and apparatus for reducing specular reflections in semiconductor lasers	7,010,012	March 7, 2006
Optically-pumped multiple-quantum well active region with improved distribution of optical pumping power	6,859,481	February 22, 2005
VCSEL with antiguide current confinement layer	6,795,478	September 21, 2004
Multiple reflectivity band reflector	6,788,466	September 7, 2004
VCSEL with heat-spreading layer	6,782,019	August 24, 2004
VCSEL assembly with edge-receiving optical devices	6,765,948	July 20, 2004
Multiple reflectivity band reflector with non-uniform profile and laser system employing same for laser wavelength monitoring	6,765,939	July 20, 2004
Laser having multiple reflectivity band reflector	6,763,053	July 13, 2004
Method and system employing multiple reflectivity band reflector for laser wavelength monitoring	6,763,046	July 13, 2004
Alternative substrates for epitaxial growth	6,746,777	June 8, 2004
Housing for passively aligning an optical fiber with a lens	6,736,550	May 18, 2004
Planar lightwave circuit for conditioning tunable laser output	6,735,224	May 11, 2004
Modified distributed bragg reflector (DBR) for vertical cavity surface-emitting laser (VCSEL) resonant wavelength tuning sensitivity control	6,724,796	April 20, 2004

Tunable vertical-cavity surface-emitting laser with tuning junction	6,697,413	February 24, 2004
Patterned phase shift layers for wavelength-selectable vertical cavity surface-emitting laser (VCSEL) arrays	6,696,307	February 24, 2004
Optical fiber with mirror for semiconductor laser	6,669,367	December 30, 2003
Method and apparatus for demounting workpieces from adhesive film	6,652,707	November 25, 2003
Method for fabricating single-mode DBR laser with improved yield	6,638,773	October 28, 2003
Overlapping wavelength-tunable vertical cavity surface-emitting laser (VCSEL) arrays	6,636,544	October 21, 2003
Vertical-cavity surface-emitting laser with metal mirror and method of fabrication of same	6,611,543	August 26, 2003
Single-mode DBR laser with improved phase-shift section	6,608,855	August 19, 2003
Double heterostructure photodiode with graded minority-carrier blocking structures	6,603,184	August 5, 2003
Method and apparatus for polarizing light in a VCSEL	6,560,265	May 6, 2003
Spatially coherent surface-emitting, grating coupled quantum cascade laser with unstable resonance cavity	6,560,259	May 6, 2003
Vertical-cavity surface-emitting laser with bottom dielectric distributed bragg reflector	6,549,556	April 15, 2003

Multispectral radiation detectors using strain-compensating superlattices	6,455,908	6,455,908 September 24, 2002
Compliant universal substrates for optoelectronic and electronic devices	6,406,795	June 18, 2002
Tunable fiber fabry-perot surface-emitting lasers	6,263,002	June 17, 2001
Modular laser package system and associated methods	7,290,943	November 6, 2007
Tunable laser with multiple in-line section	13/916,652	June 13, 2013
Monitoring nad controlling temperature across a laser array in a transmitter optical subassembly (TOSA) package	14/295,459	June 4, 2014
Tunable laser with multiple in-line section including sampled gratings	14/551,353	November 24, 2014
Two-section semiconductor laser with modulation-independent grating section to reduce chirp	14/590,456	January 6, 2015
Tunable laser including parallel lasing cavities with a common output	14/661,772	March 18, 2015
Multichannel receiver optical subassembly with improved sensitivity	14/665,639	March 23, 2015
Multi-channel transmitter optical subassembly (TOSA) with opposing placement of transistor outline (TO) can laser packages	14/837,993	August 27, 2015
Receiver optical subassembly (ROSA) housing with sidewall receptacle to provide electrical isolation between an adjacent transmitter optical subassembly (TOSA) in a transceiver housing	14/838,017	August 27, 2015

Optical filter sub-assembly cartridge for use in a receiver optical subassembly (ROSA) housing	14/974,492	December 18, 2015
Optical transceiver assembly including thermal dual arrayed waveguide grating	14/983,773	December 30, 2015
Techniques for reducing the footprint of a multi-channel transmitter optical subassembly (TOSA) within an optical transceiver housing	15/204,174	July 7, 2016
Optical component assembly having a keyed structure for ensuring proper insertion orientation within an optical subassembly	15/241,979	August 19, 2016



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/883,970	09/20/2016	9448367	PAT165USDIV	4834

27543 7590 08/31/2016
APPLIED OPTOELECTRONICS, INC.
13115 JESS PIRTLE BLVD.
SUGAR LAND, TX 77478

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

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

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

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 Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

I-Lung HO, Sugar Land, TX;
Applied Optoelectronics, Inc., Sugar Land, TX;
Stefan J. MURRY, Houston, TX;
Che-Shou (Richard) YEH, New Taipei City, TAIWAN;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (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)

27543 7590 05/20/2016
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 facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

April Davis	(Depositor's name)
<i>April Davis</i>	(Signature)
August 22, 2016	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/883,970	10/15/2015	I-Lung HO	PAT165USDIV	4834

TITLE OF INVENTION: MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	08/22/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
ANDERSON, GUY G	2883	385-078000

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 03-02 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 Grossman Tucker Perreault
2 & Pfleger, PLLC
3 Norman S. Kinsella

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 has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

Applied Optoelectronics, Inc.

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Sugar Land, Texas

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

4a. The following fee(s) are submitted:

- ☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 50-1705 (enclose an extra copy of this form).

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 _____

Typed or printed name Kevin J. Carroll

Date August 22, 2016

Registration No. 36,384

Electronic Patent Application Fee Transmittal				
Application Number:		14883970		
Filing Date:		15-Oct-2015		
Title of Invention:		MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE		
First Named Inventor/Applicant Name:		I-Lung HO		
Filer:		Kevin J. Carroll/April Davis		
Attorney Docket Number:		PAT165USDIV		
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:				
Utility Appl Issue Fee	1501	1	960	960

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				960

Electronic Acknowledgement Receipt

EFS ID:	26712406
Application Number:	14883970
International Application Number:	
Confirmation Number:	4834
Title of Invention:	MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE
First Named Inventor/Applicant Name:	I-Lung HO
Customer Number:	27543
Filer:	Kevin J. Carroll/April Davis
Filer Authorized By:	Kevin J. Carroll
Attorney Docket Number:	PAT165USDIV
Receipt Date:	22-AUG-2016
Filing Date:	15-OCT-2015
Time Stamp:	17:17:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$960
RAM confirmation Number	4275
Deposit Account	501705
Authorized User	CARROLL, KEVIN J.

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

Charge any Additional Fees required under 37 CFR 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 CFR 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 CFR 1.19 (Document supply fees)

Charge any Additional Fees required under 37 CFR 1.20 (Post Issuance fees)

Charge any Additional Fees required under 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	Issue Fee Payment (PTO-85B)	PAT165USDIV_IssueFee_Transmittal.pdf	102721	no	1
			7858641f072a4000c8e7252075fd12a0ce5e9		

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	30835	no	2
			470194e956e13a185344260db26f1741a1fbb302		

Warnings:

Information:

Total Files Size (in bytes):			133556
------------------------------	--	--	--------

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.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

27543 7590 05/20/2016
APPLIED OPTOELECTRONICS, INC.
13115 JESS PIRTLE BLVD.
SUGAR LAND, TX 77478

EXAMINER

ANDERSON, GUY G

ART UNIT

PAPER NUMBER

2883

DATE MAILED: 05/20/2016

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

14/883,970

10/15/2015

I-Lung HO

PAT165USDIV

4834

TITLE OF INVENTION: MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
-------------	---------------	---------------	---------------------	----------------------	------------------	----------

nonprovisional

UNDISCOUNTED

\$960

\$0

\$0

\$960

08/22/2016

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: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax **(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)

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.

27543 7590 05/20/2016
APPLIED OPTOELECTRONICS, INC.
13115 JESS PIRTLE BLVD.
SUGAR LAND, TX 77478

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 facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/883,970	10/15/2015	I-Lung HO	PAT165USDIV	4834

TITLE OF INVENTION: MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	08/22/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
ANDERSON, GUY G	2883	385-078000

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 03-02 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 has been filed for recordation as set forth in 37 CFR 3.11. 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. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

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. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/883,970	10/15/2015	I-Lung HO	PAT165USDIV	4834
27543 7590 05/20/2016 APPLIED OPTOELECTRONICS, INC. 13115 JESS PIRTLE BLVD. SUGAR LAND, TX 77478			EXAMINER ANDERSON, GUY G	
			ART UNIT	PAPER NUMBER
			2883	
DATE MAILED: 05/20/2016				

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 12 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.

Notice of Allowability	Application No. 14/883,970	Applicant(s) HO ET AL.	
	Examiner GUY ANDERSON	Art Unit 2883	AIA (First Inventor to File) Status No

-- 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 an amendment received 3/1/2016.
☐ 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 1-9. 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 a reply 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) | 5. ☐ Examiner's Amendment/Comment |
| 2. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 6. ☒ Examiner's Statement of Reasons for Allowance |
| 3. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 7. ☐ Other _____. |
| 4. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____. | |

/GUY ANDERSON/
Examiner, Art Unit 2883

DETAILED ACTION

Notice of Pre-AIA or AIA Status

- 1.1 The present application is being examined under the pre-AIA first to invent provisions.

Allowable Subject Matter

- 2.1 In view of applicants amendments/remarks received in the response dated 03/01/2016, this application is now deemed to be in condition for allowance and all previous rejections/objections are withdrawn. Specifically, examiner notes that applicants arguments on pages 4-5 of remarks received 3/1/2016 are persuasive. Applicant argued that "Claim 1 is directed to a dual fiber type direct link LC adapter including an adapter body portion that defines first and second LC connector receiving regions at a pluggable connector end. The adapter body portion further defines first and second slots at a direct link end. First and second direct link connector assemblies are configured to be received in the first and second slots, respectively. Each of the direct link connector assemblies defines an LC connector receptacle at one end and is further configured to be mechanically coupled to an optical fiber at another end. ***An adapter cover portion is configured to cover the first and second slots for retaining the direct link connector assemblies in the respective slots. [Emphasis added].***

As generally illustrated in FIGS. 6 and 7, this embodiment of a dual fiber type direct link adapter 250 includes an adapter body portion 260 that defines first and second connector receiving regions 262, 264 at the pluggable connector end 254 and further defines first and second slots 266, 268 at the direct link end 252. Published Application at ~[34. The first and second connector receiving regions 262, 264 are configured to receive the

Art Unit: 2883

respective pluggable optical connectors 320, 330, such as LC connectors, and the first and second slots 266, 268 are configured to receive respective direct link connector assemblies 270, 272. Id. As can be seen in FIG. 6, the slots 266, 268 are open on one side to receive the direct link connector assemblies 270, 272 in a direction orthogonal to a longitudinal axis of the slots 266, 268. ***An adapter cover portion 261 covers the slots 266, 268 and retains the direct link connector assemblies 266, 268. [Emphasis added].***

2.2 The following is an examiner's statement of reasons for allowance:

Claims 1-9 are allowed for the following reason/s:

The instant application is deemed to be directed towards a non-obvious improvement over the inventions patented and/or described in US-2006/0215970 to Mizue and US-2006/0204200 to Lampert.

2.3 Independent Claim 1 is allowed because the prior art of record, taken alone or in combination, fails to disclose or render obvious a dual fiber type direct link LC adapter that comprises ***an adapter cover portion configured to cover the first and second slots for retaining the direct link connector assemblies in the respective slots. [see #261 in applicants figures 5-7]***

2.4 Dependent Claims 2-9 depend either directly or indirectly on Claim 1 and are thus also allowed.

2.5 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."

Art Unit: 2883

- 2.6 Any inquiry concerning this communication or earlier communications from the examiner should be directed to GUY ANDERSON whose telephone number is (571) 272-8045. The examiner can normally be reached on Tuesday-Saturday 1400-2200.
- 2.7 If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Hollweg can be reached at 571.270.1739. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
- 2.8 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.

/GUY ANDERSON/	
Examiner, Art Unit 2883	

Search Notes 	Application/Control No. 14883970	Applicant(s)/Patent Under Reexamination HO ET AL.
	Examiner GUY ANDERSON	Art Unit 2883

CPC- SEARCHED		
Symbol	Date	Examiner
G02B 6/3825; 6/3879;6/42;6/4201;6/4246;6/4292;6/38;6/3807;6/3877	5/10/2016	/gga/

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
385	53-78	5/10/2016	/gga/

SEARCH NOTES		
Search Notes	Date	Examiner
Updated Searches in EAST: USPGPUB, USPAT, EPO, DERWENT, JPO.Searched inventor history through PALM.t	5/10/2016	/gga/
consulted with primary examiner Ryan Lepisto	5/10/2016	/gga/

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
385	53-78	5/10/2016	/gga/
G02b 6	G02B 6/3825; 6/3879;6/42;6/4201;6/4246;6/4292;6/38;6/3807;6/3877	5/10/2016	/gga/

/GUY ANDERSON/ Examiner.Art Unit 2883	
--	--



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

BIB DATA SHEET

CONFIRMATION NO. 4834

SERIAL NUMBER 14/883,970	FILING or 371(c) DATE 10/15/2015 RULE	CLASS 385	GROUP ART UNIT 2883	ATTORNEY DOCKET NO. PAT165USDIV		
APPLICANTS Applied Optoelectronics, Inc., Sugar Land, TX; INVENTORS I-Lung HO, Sugar Land, TX; Stefan J. MURRY, Houston, TX; Che-Shou (Richard) YEH, New Taipei City, TAIWAN; ** CONTINUING DATA ***** This application is a DIV of 13/709,195 12/10/2012 PAT 9170383 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 10/29/2015						
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and Acknowledged <u>/GUY G ANDERSON/</u> Examiner's Signature		☐ Met after Allowance Initials	STATE OR COUNTRY TX	SHEETS DRAWINGS 6	TOTAL CLAIMS 4	INDEPENDENT CLAIMS 1
ADDRESS APPLIED OPTOELECTRONICS, INC. 13115 JESS PIRTLE BLVD. SUGAR LAND, TX 77478 UNITED STATES						
TITLE MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE						
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			

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	2	"20140161394"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/10/20 00:59
S2	7	("20100232757" "6350063" "7090509").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:13
S3	0	(optical and transceiver and wdm and tosa and rosa and (dual near3 fiber near3 connector) and (lc near3 connector))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:18
S4	0	(optical and transceiver and wdm and tosa and rosa and (dual near3 fiber) and (lc near3 connector))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:19
S5	1	(optical and transceiver and wdm and tosa and rosa and (dual near3 fiber near3 connector) and (lc near3 connector))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:19
S6	25	(optical and transceiver and wdm and tosa and rosa and (dual near3 fiber near3 plug or connector) and (lc near3 connector))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:20
S7	0	g02b6/42,4201,4246,4292	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:44
S8	76626	g02b6/42	US-PGPUB;	OR	OFF	2015/01/07

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			15:44
S9	2932	g02b6/4201	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:44
S10	6094	g02b6/4246	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:44
S11	5387	g02b6/4292	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:44
S12	51462	g02b6/38	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:45
S13	1130	g02b6/3807	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:45
S14	2839	g02b6/3869	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:45
S15	871	g02b6/3877	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:45
S16	120993	S8 S9 S10 S11 S12 S13 S14 S15	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2015/01/07 15:45

			IBM_TDB			
S19	11	S16 and (TOSA and ROSA and WDM)	USPAT	OR	OFF	2015/01/07 15:50
S20	1	S16 and (TOSA and ROSA and WDM and (dual near5 (plug fiber connector)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:51
S23	42	(optical and transceiver and wdm and tosa and rosa and (dual near3 fiber near3 plug or connector) and (LC near3 connector))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/01/07 15:56
S26	25	(optical and transceiver and wdm and tosa and rosa and (dual near3 fiber near3 plug or connector) and (lc near3 connector))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 21:28
S27	3	S26 and line near4 terminal	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/01/07 21:28
S28	21	("20110103797" "20100232757" "20110229095" "20110255831" "6350063" "7090509" "20110225792" "20120275784" "20130156418" "20060215970" "20110229096" "20110262078").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:44
S29	4513	g02b6/42.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:56
S30	5589	g02b6/4201.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:57
S31	10722	g02b6/4246.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:57
S32	9795	g02b6/4292.cpc.	US-PGPUB;	OR	OFF	2015/11/16

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			03:57
S33	472	g02b6/38.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:57
S34	1829	g02b6/3807.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:57
S35	1215	g02b6/3877.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:57
S36	5981	g02b6/3825.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:57
S37	2172	g02b6/3879.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:57
S38	11809	385/53-78.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:59
S44	5981	g02b6/3825.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 04:01
S45	2172	g02b6/3879.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2015/11/16 04:01

			IBM_TDB			
S46	11809	385/53-78.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 04:01
S47	17532	S44 S45 S46	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/11/16 04:02
S48	5981	g02b6/3825.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 07:09
S49	2172	g02b6/3879.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 07:09
S50	11809	385/53-78.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 07:09
S51	17532	S48 S49 S50	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/11/16 07:09
S52	2	S51 and ((dual near3 fiber near4 ('LC with adapter) and cover))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/11/16 07:09
S53	6	((dual near3 fiber near4 ('LC with adapter) and cover))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/11/16 07:10
S54	28	(optical and transceiver and wdm and tosa and rosa and (dual near3 fiber near3 plug or connector) and (LC near3 connector))	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2015/11/16 07:15

			EPO; JPO; DERWENT; IBM_TDB			
S55	44	(US-20080013148-\$ or US-20140133807-\$ or US-20130011102-\$ or US-20040223701-\$ or US-20040062486-\$ or US-20030147597-\$ or US-20140147082-\$ or US-20130121643-\$ or US-20130195405-\$ or US-20130084041-\$ or US-20110274437-\$ or US-20040171283-\$ or US-20110228811-\$).did. or (US-4666242-\$ or US-7144163-\$ or US-5179610-\$ or US-8636422-\$ or US-8985861-\$ or US-8920043-\$ or US-8870466-\$ or US-7841778-\$ or US-7708474-\$ or US-8491198-\$).did.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 07:24
S56	22	("20060154529" "20060204200" "20140016901" "20140072263" "6347888" "6461054" "7029322" "7198409" "8794851").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 07:26
S57	84	("6302592" "6524014" "20110038581" "6425694" "5883995" "7837395" "5909526" "6206577" "6471412" "6685362" "6688780" "7661887" "6789950" "20080267566" "6004043" "6296398" "7785018" "6039585" "6595696" "6764222" "7785018" "7841777" "6789950" "20110038581" "7676133" "5363460" "5716224" "8186890" "20070230874" "6247849" "6461054" "7340146" "7686518" "6004043" "6715930" "20090028507" "6715930" "7261472" "7284912" "7676133" "6685362").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 07:30
S58	31	("20020064349" "20020090177" "20040017980" "20050244107" "20060089049" "20070196053" "20130084041" "20130121643" "5647043" "5969294" "6247849" "6623170").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 07:44
S59	48327	(optical near4 fiber near4 (connector adapter))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/11/16 07:55
S60	12572	S59 and ((shutter cover) or (dust near4 protect\$5))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/11/16 07:55

S61	270	S60 and dual and 'LC'	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/11/16 07:55
S62	16	(US-20060215970-\$ or US-20130156418-\$ or US-20120275784-\$ or US-20060204200-\$ or US-20140147082-\$ or US-20130195405-\$ or US-20110038581-\$ or US-20020090177-\$).did. or (US-7029322-\$ or US-5363460-\$ or US-6247849-\$).did. or (US-5909526-\$ or US-20060204200-\$ or US-20090074359-\$ or US-20090226141-\$ or US-6247849-\$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2015/11/16 07:58
S63	7	S62 and 'LC'	US-PGPUB; USPAT; DERWENT	OR	ON	2015/11/16 07:58
S64	2	((direct near4 link) and (optical near4 fiber near4 (connector plug)) and (dual with adapter with 'LC'))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:20
S65	10	((optical near4 fiber near4 (connector plug)) and (dual with adapter with 'LC'))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:21
S66	80265	g02b6/42	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:49
S67	3030	g02b6/4201	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:49
S68	6425	g02b6/4246	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:49
S69	5807	g02b6/4292	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2015/11/16 08:49

			IBM_TDB			
S70	54324	g02b6/38	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:49
S71	1200	g02b6/3807	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:49
S72	2996	g02b6/3869	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:49
S73	896	g02b6/3877	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:49
S74	127295	S66 S67 S68 S69 S70 S71 S72 S73	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:49
S75	242	S74 and ('LC' near4 adapter)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/11/16 08:49
S76	2	"20160041343"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/05/10 04:00

5/ 10/ 2016 4:58:10 AM
C:\Users\ganderson\ Documents\ EAST\ Workspaces\ 14-883970 dual fiber direct link LC
adapter.wsp

Issue Classification 	Application/Control No. 14883970	Applicant(s)/Patent Under Reexamination HO ET AL.	
	Examiner GUY ANDERSON	Art Unit 2883	

CPC						
Symbol					Type	Version
G02B		6	/	3825	F	2013-01-01
G02B		6	/	3877	A	2013-01-01
G02B		6	/	42	A	2013-01-01
G02B		6	/	3869	A	2013-01-01
G02B		6	/	3807	A	2013-01-01
G02B		6	/	38	A	2013-01-01
G02B		6	/	4201	A	2013-01-01
G02B		6	/	3874	A	2013-01-01
G02B		6	/	421	I	2013-01-01
G02B		6	/	4246	I	2013-01-01
G02B		6	/	4292	I	2013-01-01
G02B		6	/	4293	I	2013-01-01
G02B		6	/	3879	I	2013-01-01
			/			
			/			

CPC Combination Sets				
Symbol	Type	Set	Ranking	Version

/GUY ANDERSON/ Examiner.Art Unit 2883 (Assistant Examiner)	05/10/2016 (Date)	Total Claims Allowed: 9	
/RYAN LEPISTO/ Primary Examiner.Art Unit 2883 (Primary Examiner)	05/10/2016 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 7

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/883,970	Filing Date 10/15/2015	☐ To be Mailed
---	---	----------------------------------	---------------------------------------

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	03/01/2016	CLAIMS REMAINING AFTER AMENDMENT	Minus	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 9	Minus	** 20	= 0	X \$80 =	0
	Independent (37 CFR 1.16(h))	* 1	Minus	***3	= 0	X \$420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
TOTAL ADD'L FEE						0	

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	Minus	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =
	☐ Application Size Fee (37 CFR 1.16(s))					
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
TOTAL ADD'L FEE						

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/CAROL BARNES/

This collection of information is required by 37 CFR 1.16. 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 12 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 14/883,970 Confirmation No. : 4834
Applicant : I-Lung Ho et al.
Filed : October 15, 2015
TC/A.U. : 2883
Examiner : Anderson, Guy G
Docket No. : PAT165USDIV
Customer No. : 27543

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AND REPLY UNDER 37 CFR § 1.111

Sir:

In response to the Office Action dated November 24, 2015, please amend the application as follows and consider the included remarks. Applicant herewith petitions the Director of the United States Patent and Trademark Office to extend the time for reply to the Office Action dated November 24, 2015 for one (1) month from February 24, 2016 to March 24, 2016. Submitted herewith is Credit Card Payment Form PTO-2038 for \$200 to cover the cost of the extension.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A dual fiber type direct link LC adapter comprising:
an adapter body portion defining first and second LC connector receiving regions at a[[n]] pluggable connector end and defining first and second slots at a direct link end;
first and second direct link connector assemblies configured to be received in the first and second slots, respectively, each of the direct link connector assemblies defining an LC connector receptacle at one end, wherein the LC connector receptacle extends into a respective one of the LC connector receiving regions and is configured to receive a portion of an LC connector for optical coupling, and wherein each of the direct link connector assemblies is configured to be mechanically coupled to an optical fiber at another end;_[[,]] and
an adapter cover portion configured to cover the first and second slots for retaining the direct link connector assemblies in the respective slots.
2. (Original) The dual fiber type direct link LC adapter of claim 1, wherein each of the direct link connector assemblies include a fiber ferrule for receiving the optical fiber and a sleeve around the fiber ferrule for defining at least a portion of the LC connector receptacle.
3. (Original) The dual fiber type direct link LC adapter of claim 1 wherein a length of the dual fiber type direct link adapter from the direct link end to the pluggable connector end is less than 30 mm.
4. (Currently Amended) The dual fiber type direct link LC adapter of claim 2[[1]] wherein each of the direct link connector assemblies further comprises an outer housing around the fiber ferrule and the sleeve, the outer housing defining at least a portion of the connector receptacle and including a flange portion for securing the direct link connector assembly.

5. (New) The dual fiber type direct link LC adapter of claim 1 wherein the first and second slots are open on one side to receive the first and second direct link connector assemblies, respectively, in a direction orthogonal to longitudinal axes of the slots.

6. (New) The dual fiber type direct link LC adapter of claim 5 wherein the first and second slots include grooves, respectively, for engaging the direct link connector assemblies to prevent axial movement.

7. (New) The dual fiber type direct link LC adapter of claim 1 wherein the first and second slots include grooves, respectively, for engaging the direct link connector assemblies to prevent axial movement.

8. (New) The dual fiber type direct link LC adapter of claim 7 wherein the first and second direct link connector assemblies further comprises flange portions configured to extend into the grooves of the first and second slots, respectively.

9. (New) The dual fiber type direct link LC adapter of claim 6 wherein the first and second direct link connector assemblies further comprises flange portions configured to extend into the grooves of the first and second slots, respectively.

REMARKS

Please reconsider the application in view of the following remarks. Applicant submits that the claims, as presented, are in condition for allowance and respectfully requests the withdrawal of all pending rejections of the claims.

Status of Claims

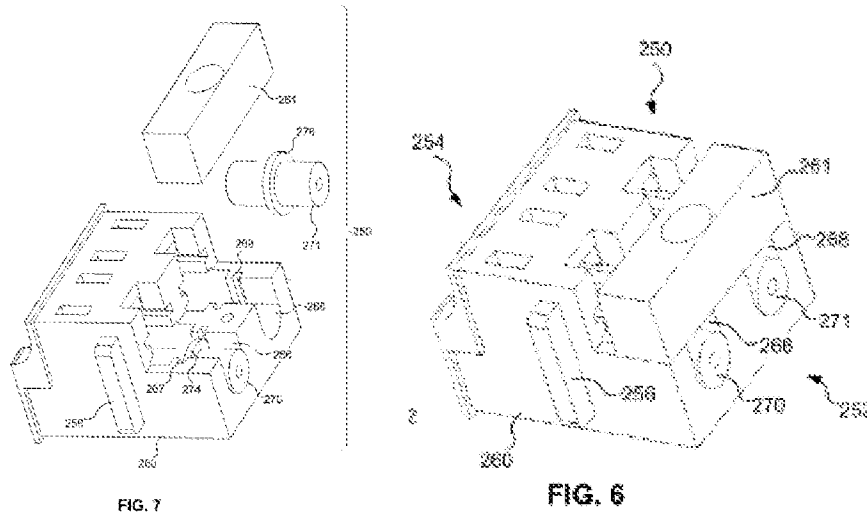
Claims 1-4 stand rejected. Claims 1 and 4 have been amended to correct typographic errors. Dependent claims 5-9 have been added to provide further clarification. Support for claims 5-9 may be found, for example, in FIGS. 6 and 7 and in paragraphs 0034 and 0037 of the present specification. No new matter has been added.

Rejections under 35 U.S.C. § 103

Claims 1-4 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Mizue et al. (U.S. Pat. Pub. No. 2006/0215970), hereinafter Mizue, in view of Lampert et al. (U.S. Pat. Pub. No. 2006/0204200), hereinafter Lampert.

Claim 1 is directed to a dual fiber type direct link LC adapter including an adapter body portion that defines first and second LC connector receiving regions at a pluggable connector end. The adapter body portion further defines first and second slots at a direct link end. First and second direct link connector assemblies are configured to be received in the first and second slots, respectively. Each of the direct link connector assemblies defines an LC connector receptacle at one end and is further configured to be mechanically coupled to an optical fiber at another end. An adapter cover portion is configured to cover the first and second slots for retaining the direct link connector assemblies in the respective slots.

One embodiment of the claimed dual fiber type direct link LC adapter is shown in FIGS. 6 and 7 of the present application, which are reproduced below.



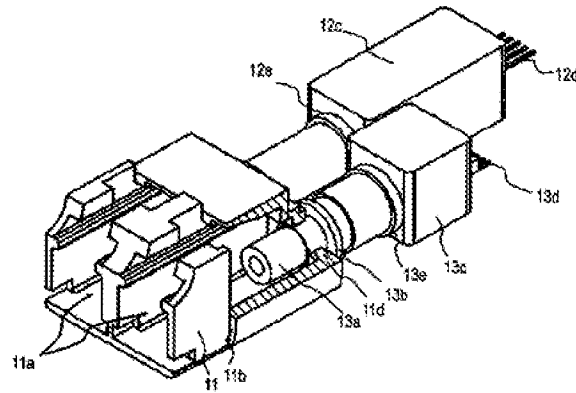
As generally illustrated in FIGS. 6 and 7, this embodiment of a dual fiber type direct link adapter **250** includes an adapter body portion **260** that defines first and second connector receiving regions **262**, **264** at the pluggable connector end **254** and further defines first and second slots **266**, **268** at the *direct link end 252*. Published Application at ¶ 34. The first and second connector receiving regions **262**, **264** are configured to receive the respective pluggable optical connectors **320**, **330**, such as LC connectors, and the first and second slots **266**, **268** are configured to receive respective direct link connector assemblies **270**, **272**. *Id.* As can be seen in FIG. 6, the slots **266**, **268** are open on one side to receive the direct link connector assemblies **270**, **272** in a direction orthogonal to a longitudinal axis of the slots **266**, **268**. An adapter cover portion **261** covers the slots **266**, **268** and retains the direct link connector assemblies **266**, **268**. *Id.*

Applicant respectfully submits that the proposed combination of Mizue and Lampert would not result in the claimed invention, namely, a dual fiber type direct link adapter including slots at a direct link end configured to receive direct link connector assemblies and an adapter cover to cover the slots for retaining the direct link connector assemblies. With respect to the claimed slots, the Office Action refers to Mizue and “slots in adapter 11 that receive ROSA 13 and TOSA 12.” Applicant respectfully disagrees with the position taken by the Office Action for at least the following reasons.

As shown in FIG. 2 of Mizue (reproduced below), Mizue discloses a receptacle member **11** having a cavity **11a** for receiving an optical connector and an opening in a rear wall **11d** for

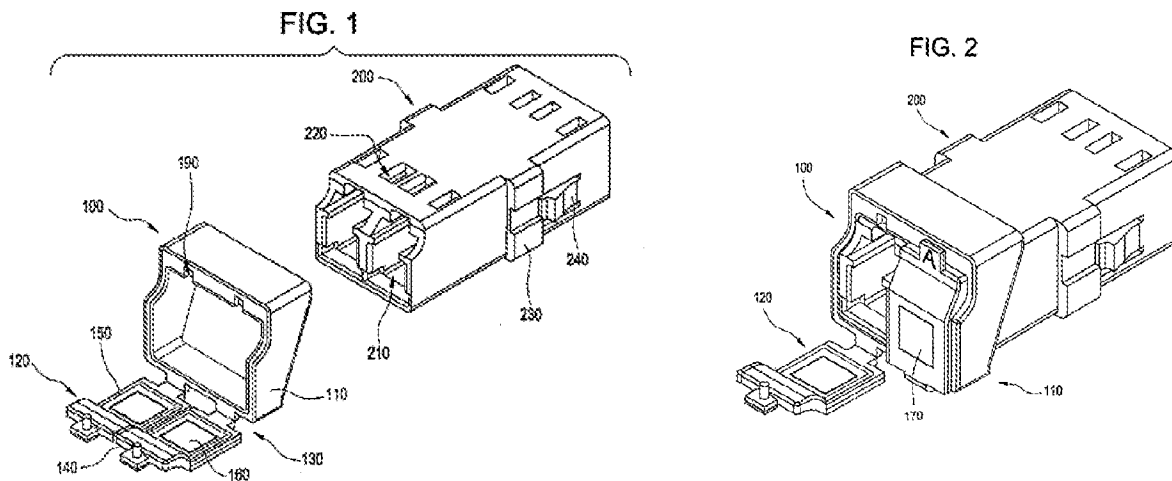
receiving sleeves **12a**, **13a**. *Id.* at ¶ 23, 29. The receptacle member **11** is not described as including first and second slots for receiving first and second direct link connector assemblies, as is recited in claim 1. Rather, Mizue, at best, discloses an opening in the rear wall **11d** for receiving the sleeves **12a**, **13a**. As such, Mizue fails to disclose first and second slots at a direct link end for receiving first and second direct link connector assemblies.

FIG. 2



With respect to the claimed adapter cover configured to cover the slots for retaining the direct link connector assemblies, the Office Action refers to the cover **120** of Lampert. Applicant respectfully disagrees for at least the following reasons.

As shown in FIGS. 1 and 2 of Lampert (reproduced below), the covers **120** are part of a dust shutter **100** to cover a corresponding *optical connector port 210*. Lampert at ¶ 28-29, 32.



At best, a combination of Lampert with Mizue would result in the dust covers **120** being used to cover optical connector ports of the cavities **11a** of the receptacle member **11** in Mizue. Even if Mizue had slots at the other end of the receptacle member **11** to receive the sleeves **12a**, **13a** of the TOSA **12** and the ROSA **13**, the dust covers would not be used at that end to cover these slots to retain the sleeves **12a**, **13a**. If the dust covers were used at the other end to cover the openings receiving the sleeves **12a**, **13a**, the covers **120** would prevent the sleeves **12a**, **13a** of the TOSA **12** and the ROSA **13** from being received in the respective openings in the rear wall **11d**. Not only would this combination not result in the claimed invention, but would render Mizue unsatisfactory for its intended purpose. *See* MPEP § 2143.01(V) (stating “[i]f [the] proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification”).

Because the proposed combination of Mizue and Lampert would not result in the claimed dual fiber type direct link adapter including slots at a direct link end configured to receive direct link connector assemblies and an adapter cover to cover the slots for retaining the direct link connector assemblies, claim 1 and the claims dependent therefrom would not have been obvious over this proposed combination. In view of the above remarks, Applicant respectfully requests the withdrawal of the rejections of claims 1-4 under 35 U.S.C. § 103(a).

With respect to dependent claim 3, the Office Action takes official notice that determining the optimal working range of an optical connector adapter is within the skill of a general worker in the art. Office Action at 5. Applicant respectfully disagrees. MPEP § 2144.03 states that “assertions of technical facts in the areas of esoteric technology...must always be supported by citation to some reference work” and “[i]t is never appropriate to rely solely on common knowledge in the art without evidentiary support in the record as the principal evidence upon which a rejection was based.” As such, the Applicant respectfully requests that the Office provide a reference showing this limitation in accordance with MPEP § 2144.03.

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 November 24, 2015, and respectfully requests favorable action in this application. The examiner is invited to telephone the undersigned, applicant’s attorney of record, to facilitate

Appl. No. 14/883,970
Amendment dated March 1, 2016
Reply to Office action of November 24, 2015

advancement of the present application. Please apply any charges not covered, or any credits, to
Deposit Account 50-1705 (Reference Number PAT165USDIV).

Respectfully submitted,

GROSSMAN, TUCKER, PERREAULT &
PFLEGER PLLC

Date: March 1, 2016

By: /Kevin J. Carroll/
Kevin J. Carroll, Reg. No. 36,384

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

Electronic Patent Application Fee Transmittal

Application Number:	14883970			
Filing Date:	15-Oct-2015			
Title of Invention:	MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE			
First Named Inventor/Applicant Name:	I-Lung HO			
Filer:	Kevin J. Carroll/April Davis			
Attorney Docket Number:	PAT165USDIV			
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:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 1 month with \$0 paid	1251	1	200	200
Miscellaneous:				
Total in USD (\$)				200

Electronic Acknowledgement Receipt

EFS ID:	25062040
Application Number:	14883970
International Application Number:	
Confirmation Number:	4834
Title of Invention:	MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE
First Named Inventor/Applicant Name:	I-Lung HO
Customer Number:	27543
Filer:	Kevin J. Carroll/April Davis
Filer Authorized By:	Kevin J. Carroll
Attorney Docket Number:	PAT165USDIV
Receipt Date:	01-MAR-2016
Filing Date:	15-OCT-2015
Time Stamp:	12:06:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$200
RAM confirmation Number	12889
Deposit Account	502121
Authorized User	CARROLL, KEVIN J.

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

Charge any Additional Fees required under 37 CFR 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 CFR 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 CFR 1.19 (Document supply fees)

Charge any Additional Fees required under 37 CFR 1.20 (Post Issuance fees)

Charge any Additional Fees required under 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		PAT165USDIV_Amendment_as filed_030116.pdf	188250 116253f038644581aac28fd158f6475aff115f08	yes	8

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	3
Applicant Arguments/Remarks Made in an Amendment	4	8

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	31210 a7d51cecd0ced8791123f32b7bc5af9a70e3776a	no	2
---	----------------------	--------------	---	----	---

Warnings:

Information:

Total Files Size (in bytes): 219460

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.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/883,970	10/15/2015	I-Lung HO	PAT165USDIV

CONFIRMATION NO. 4834

PUBLICATION NOTICE



OC000000080538928

27543
APPLIED OPTOELECTRONICS, INC.
13115 JESS PIRTLE BLVD.
SUGAR LAND, TX 77478

Title:MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE

Publication No.US-2016-0041343-A1

Publication Date:02/11/2016

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/883,970	10/15/2015	I-Lung HO	PAT165USDIV	4834
27543 7590 11/24/2015 APPLIED OPTOELECTRONICS, INC. 13115 JESS PIRTLE BLVD. SUGAR LAND, TX 77478			EXAMINER ANDERSON, GUY G	
			ART UNIT	PAPER NUMBER
			2883	
			MAIL DATE	DELIVERY MODE
			11/24/2015	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 14/883,970	Applicant(s) HO ET AL.	
	Examiner GUY ANDERSON	Art Unit 2883	AIA (First Inventor to File) Status No

-- 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 10/15/2015.
☐ 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) 1-4 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) 1-4 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 10/15/2015 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) | 3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date _____ | 4) ☐ Other: _____ |

DETAILED ACTION

Notice of Pre-AIA or AIA Status

- 1.1 The present application is being examined under the pre-AIA first to invent provisions.

Claim Rejections - 35 USC § 103

- 2.1 The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

- 2.2 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 pre-AIA 35 U.S.C. 103(a) 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.

- 2.3 **Independent Claim 1 and dependent claims 2-4 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over US-2006/0215970 to Mizue and in further view of US-2006/0204200 to Lampert.**

Regarding independent claim 1, Mizue discloses an optical transceiver with LC adapter link comprising [see Mizue at fig. 1-7]:

Art Unit: 2883

1a) A dual fiber type direct link LC adapter comprising: an adapter body portion [11] defining first and second LC connector receiving regions [11a] at an pluggable connector end and defining first and second slots at a direct link end [see slots in adapter 11 that receive ROSA 13 and TOSA 12]; first and second direct link connector assemblies [12 and 13] configured to be received in the first and second slots, respectively, each of the direct link connector assemblies defining an LC connector receptacle at one end [12 and 13 are designed to receive LC connector], wherein the LC connector receptacle extends into a respective one of the LC connector receiving regions [the slots for 12 and 13 extend into LC plug entry end 11a of adapter 11] and is configured to receive a portion of an LC connector for optical coupling [11a receives an LC connector plug], and wherein each of the direct link connector assemblies is configured to be mechanically coupled to an optical fiber at another end [12 and 13 sleeves and ferrules are coupled to fibers in TOSA and ROSA].

Mizue does not disclose:

1b) an adapter cover portion configured to cover the first and second slots for retaining the direct link connector assemblies in the respective slots.

Lampert discloses a dust shutter for an optical fiber connector adapter that has a cover portion or door assembly #120 as a means of preventing contaminants from getting onto the connectors. [See Fig. 1, there are actually two #120 covers, one for each of the two LC plug openings]

Art Unit: 2883

Since Lampert and Mizue are both from the same field of endeavor, the structure and teachings of Lampert regarding dust shutters or covers would have been recognized as being in the pertinent art of Lampert.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Lampert with the structure Mizue as a means of preventing contaminants from getting onto the connectors.

The motivation would have been to combine known elements/methods [dust covers or shutters] to achieve a predictable result [preventing contaminants from getting onto the connectors].

Regarding claims 2 and 4, Mizue discloses:

2. The dual fiber type direct link LC adapter of claim 1, wherein each of the direct link connector assemblies [12, 13] include a fiber ferrule for receiving the optical fiber and a sleeve [see fig. 2, 12a, 13a, sleeves around ferrules] around the fiber ferrule for defining at least a portion of the LC connector receptacle.

4. The dual fiber type direct link LC adapter of claim 1 wherein each of the direct link connector assemblies [12, 13] further comprises an outer housing [fig. 2-4, #17] around the fiber ferrule and sleeve, the outer housing defining at least a portion of the connector receptacle [17 defines an opening for 12 and 13 connector receptacles] and including a flange portion [17 has flange and opening 17d] for securing the direct link connector assembly 17 secures 12 and 13 in 11].

Regarding claim 3, the combination of Mizue and Lampert disclose all of the limitations of the base claim 1 but does not disclose:

3. The dual fiber type direct link LC adapter of claim 1 wherein a length of the dual fiber type direct link adapter from the direct link end to the pluggable connector end is less than 30 mm.

Examiner takes official notice that determining the optimal working range of an optical connector adapter is within the skill of a general worker in the art. See MPEP§2144.04 (IV)(A)

In *Gardner v. TEC Syst., Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

Therefore it would have been obvious to one of ordinary skill in the art to design an adapter with claimed limitations as a means of providing an industry standard connector adapter.

Conclusion

3.1 Any inquiry concerning this communication or earlier communications from the examiner should be directed to GUY ANDERSON whose telephone number is (571)272-8045. The examiner can normally be reached on Tuesday-Saturday 1400-2200.

Art Unit: 2883

- 3.2 If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas A. Hollweg can be reached on 571.270.1739. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
- 3.3 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.

/GUY ANDERSON/ Examiner, Art Unit 2883	/Ryan Lepisto/ Primary Examiner, Art Unit 2883
---	---

Notice of References Cited	Application/Control No. 14/883,970		Applicant(s)/Patent Under Reexamination HO ET AL.	
	Examiner GUY ANDERSON		Art Unit 2883	Page 1 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2006/0215970 A1	09-2006	Mizue; Toshio	G02B6/3878	385/92
*	B	US-2013/0156418 A1	06-2013	Stapleton; Brent	H04B10/40	398/25
*	C	US-2012/0275784 A1	11-2012	Soto; Alexander I.	H04B10/2503	398/38
*	D	US-2006/0204200 A1	09-2006	Lampert; Norman Roger	G02B6/3849	385/139
*	E	US-7,029,322 B2	04-2006	Ernst; Scot A.	G02B6/4277	385/56
*	F	US-2014/0147082 A1	05-2014	LEE; WEI-CHENG	G02B6/3825	385/78
*	G	US-2013/0195405 A1	08-2013	Sanders; Joseph E.	G02B6/3825	385/56
*	H	US-5,909,526 A	06-1999	Roth; Richard F.	G02B6/3885	385/56
*	I	US-2006/0204200 A1	09-2006	Lampert; Norman Roger	G02B6/3849	385/139
*	J	US-2009/0074359 A1	03-2009	CASE; Richard L.	G02B6/3825	385/53
*	K	US-2009/0226141 A1	09-2009	Lin; I En	G02B6/3825	385/134
*	L	US-5,363,460 A	11-1994	Marazzi; Silvio	G02B6/3825	385/55
*	M	US-2011/0038581 A1	02-2011	Mudd; Ronald	G02B6/3849	385/53

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	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.

Notice of References Cited	Application/Control No. 14/883,970		Applicant(s)/Patent Under Reexamination HO ET AL.	
	Examiner GUY ANDERSON		Art Unit 2883	Page 2 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2002/0090177 A1	07-2002	Anderson, Jerry Max	G02B6/3825	385/60
*	B	US-6,247,849 B1	06-2001	Liu; Ching-Yuan	G02B6/3849	385/55
*	C	US-2011/0103797 A1	05-2011	OKI; Kazushige	G02B6/4201	398/79
*	D	US-2011/0225792 A1	09-2011	OKI; Kazushige	G02B6/4201	29/428
*	E	US-8,550,725 B2	10-2013	Oki; Kazushige	G02B6/4201	385/89
*	F	US-8,579,521 B2	11-2013	Oki; Kazushige	G02B6/4201	385/89
*	G	US-8,821,038 B2	09-2014	Oki; Kazushige	G02B6/4292	385/89
*	H	US-2011/0217008 A1	09-2011	Cline; Timothy S.	G02B6/3869	385/78
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	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.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	2	"20140161394"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/10/20 00:59
S2	7	("20100232757" "6350063" "7090509").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:13
S3	0	(optical and transceiver and wdm and tosa and rosa and (dual near3 fiber near3 connector) and (lc near3 connector))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:18
S4	0	(optical and transceiver and wdm and tosa and rosa and (dual near3 fiber) and (lc near3 connector))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:19
S5	1	(optical and transceiver and wdm and tosa and rosa and (dual near3 fiber near3 connector) and (lc near3 connector))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:19
S6	25	(optical and transceiver and wdm and tosa and rosa and (dual near3 fiber near3 plug or connector) and (lc near3 connector))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:20
S7	0	g02b6/42,4201,4246,4292	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:44
S8	76626	g02b6/42	US-PGPUB;	OR	OFF	2015/01/07

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			15:44
S9	2932	g02b6/4201	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:44
S10	6094	g02b6/4246	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:44
S11	5387	g02b6/4292	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:44
S12	51462	g02b6/38	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:45
S13	1130	g02b6/3807	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:45
S14	2839	g02b6/3869	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:45
S15	871	g02b6/3877	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:45
S16	120993	S8 S9 S10 S11 S12 S13 S14 S15	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2015/01/07 15:45

			IBM_TDB			
S19	11	S16 and (TOSA and ROSA and WDM)	USPAT	OR	OFF	2015/01/07 15:50
S20	1	S16 and (TOSA and ROSA and WDM and (dual near5 (plug fiber connector)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 15:51
S23	42	(optical and transceiver and wdm and tosa and rosa and (dual near3 fiber near3 plug or connector) and (LC near3 connector))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/01/07 15:56
S26	25	(optical and transceiver and wdm and tosa and rosa and (dual near3 fiber near3 plug or connector) and (lc near3 connector))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/01/07 21:28
S27	3	S26 and line near4 terminal	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/01/07 21:28
S28	21	("20110103797" "20100232757" "20110229095" "20110255831" "6350063" "7090509" "20110225792" "20120275784" "20130156418" "20060215970" "20110229096" "20110262078").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:44
S29	4513	g02b6/42.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:56
S30	5589	g02b6/4201.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:57
S31	10722	g02b6/4246.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:57
S32	9795	g02b6/4292.cpc.	US-PGPUB;	OR	OFF	2015/11/16

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			03:57
S33	472	g02b6/38.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:57
S34	1829	g02b6/3807.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:57
S35	1215	g02b6/3877.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:57
S36	5981	g02b6/3825.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:57
S37	2172	g02b6/3879.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:57
S38	11809	385/53-78.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 03:59
S44	5981	g02b6/3825.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 04:01
S45	2172	g02b6/3879.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2015/11/16 04:01

			IBM_TDB			
S46	11809	385/53-78.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 04:01
S47	17532	S44 S45 S46	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/11/16 04:02
S48	5981	g02b6/3825.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 07:09
S49	2172	g02b6/3879.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 07:09
S50	11809	385/53-78.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 07:09
S51	17532	S48 S49 S50	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/11/16 07:09
S52	2	S51 and ((dual near3 fiber near4 ('LC with adapter) and cover))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/11/16 07:09
S53	6	((dual near3 fiber near4 ('LC with adapter) and cover))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/11/16 07:10
S54	28	(optical and transceiver and wdm and tosa and rosa and (dual near3 fiber near3 plug or connector) and (LC near3 connector))	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2015/11/16 07:15

			EPO; JPO; DERWENT; IBM_TDB			
S55	44	(US-20080013148-\$ or US-20140133807-\$ or US-20130011102-\$ or US-20040223701-\$ or US-20040062486-\$ or US-20030147597-\$ or US-20140147082-\$ or US-20130121643-\$ or US-20130195405-\$ or US-20130084041-\$ or US-20110274437-\$ or US-20040171283-\$ or US-20110228811-\$).did. or (US-4666242-\$ or US-7144163-\$ or US-5179610-\$ or US-8636422-\$ or US-8985861-\$ or US-8920043-\$ or US-8870466-\$ or US-7841778-\$ or US-7708474-\$ or US-8491198-\$).did.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 07:24
S56	22	("20060154529" "20060204200" "20140016901" "20140072263" "6347888" "6461054" "7029322" "7198409" "8794851").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 07:26
S57	84	("6302592" "6524014" "20110038581" "6425694" "5883995" "7837395" "5909526" "6206577" "6471412" "6685362" "6688780" "7661887" "6789950" "20080267566" "6004043" "6296398" "7785018" "6039585" "6595696" "6764222" "7785018" "7841777" "6789950" "20110038581" "7676133" "5363460" "5716224" "8186890" "20070230874" "6247849" "6461054" "7340146" "7686518" "6004043" "6715930" "20090028507" "6715930" "7261472" "7284912" "7676133" "6685362").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 07:30
S58	31	("20020064349" "20020090177" "20040017980" "20050244107" "20060089049" "20070196053" "20130084041" "20130121643" "5647043" "5969294" "6247849" "6623170").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 07:44
S59	48327	(optical near4 fiber near4 (connector adapter))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/11/16 07:55
S60	12572	S59 and ((shutter cover) or (dust near4 protect\$5))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/11/16 07:55

S61	270	S60 and dual and 'LC'	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/11/16 07:55
S62	16	(US-20060215970-\$ or US-20130156418-\$ or US-20120275784-\$ or US-20060204200-\$ or US-20140147082-\$ or US-20130195405-\$ or US-20110038581-\$ or US-20020090177-\$).did. or (US-7029322-\$ or US-5363460-\$ or US-6247849-\$).did. or (US-5909526-\$ or US-20060204200-\$ or US-20090074359-\$ or US-20090226141-\$ or US-6247849-\$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2015/11/16 07:58
S63	7	S62 and 'LC'	US-PGPUB; USPAT; DERWENT	OR	ON	2015/11/16 07:58
S64	2	((direct near4 link) and (optical near4 fiber near4 (connector plug)) and (dual with adapter with 'LC'))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:20
S65	10	((optical near4 fiber near4 (connector plug)) and (dual with adapter with 'LC'))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:21
S66	80265	g02b6/42	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:49
S67	3030	g02b6/4201	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:49
S68	6425	g02b6/4246	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:49
S69	5807	g02b6/4292	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2015/11/16 08:49

			IBM_TDB			
S70	54324	g02b6/38	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:49
S71	1200	g02b6/3807	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:49
S72	2996	g02b6/3869	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:49
S73	896	g02b6/3877	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:49
S74	127295	S66 S67 S68 S69 S70 S71 S72 S73	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/11/16 08:49
S75	242	S74 and ('LC' near4 adapter)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/11/16 08:49

11/ 16/ 2015 9:43:29 AM
C:\ Users\ ganderson\ Documents\ EAST\ Workspaces\ 14-883970 dual fiber direct link LC
adapter.wsp

Search Notes 	Application/Control No. 14883970	Applicant(s)/Patent Under Reexamination HO ET AL.
	Examiner GUY ANDERSON	Art Unit 2883

CPC- SEARCHED		
Symbol	Date	Examiner
G02B 6/3825; 6/3879	11/16/2015	/gga/

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
385	53-78	11/16/2015	/gga/

SEARCH NOTES		
Search Notes	Date	Examiner
Searched EAST: USPGPUB, USPAT, EPO, DERWENT, JPO.Searched inventor history through PALM, Searched applicable foreign priority documents.	11/16/2015	/gga/

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

/GUY ANDERSON/ Examiner.Art Unit 2883	
--	--



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

BIB DATA SHEET

CONFIRMATION NO. 4834

SERIAL NUMBER 14/883,970	FILING or 371(c) DATE 10/15/2015 RULE	CLASS 385	GROUP ART UNIT 2883	ATTORNEY DOCKET NO. PAT165USDIV	
APPLICANTS Applied Optoelectronics, Inc., Sugar Land, TX; INVENTORS I-Lung HO, Sugar Land, TX; Stefan J. MURRY, Houston, TX; Che-Shou (Richard) YEH, New Taipei City, TAIWAN; ** CONTINUING DATA ***** This application is a DIV of 13/709,195 12/10/2012 PAT 9170383 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 10/29/2015					
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and Acknowledged <u>/GUY G ANDERSON/</u> Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY TX	SHEETS DRAWINGS 6	TOTAL CLAIMS 4	INDEPENDENT CLAIMS 1
ADDRESS APPLIED OPTOELECTRONICS, INC. 13115 JESS PIRTLE BLVD. SUGAR LAND, TX 77478 UNITED STATES					
TITLE MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE					
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		



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
14/883,970	10/15/2015	2883	1600	PAT165USDIV	4	1

CONFIRMATION NO. 4834

FILING RECEIPT



0000000078385345

27543
APPLIED OPTOELECTRONICS, INC.
13115 JESS PIRTLE BLVD.
SUGAR LAND, TX 77478

Date Mailed: 11/02/2015

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

I-Lung HO, Sugar Land, TX;
Stefan J. MURRY, Houston, TX;
Che-Shou (Richard) YEH, New Taipei City, TAIWAN;

Applicant(s)

Applied Optoelectronics, Inc., Sugar Land, TX;

Power of Attorney: The patent practitioners associated with Customer Number 27543

Domestic Priority data as claimed by applicant

This application is a DIV of 13/709,195 12/10/2012 PAT 9170383

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 10/29/2015

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/883,970**

Projected Publication Date: 02/11/2016

Non-Publication Request: No

Early Publication Request: No

Title

MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE
DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE
TRANSCEIVER MODULE

Preliminary Class

385

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 14/883,970				
APPLICATION AS FILED - PART I										
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)			
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280			
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	600			
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720			
TOTAL CLAIMS (37 CFR 1.16(j))	4	minus 20 = *			OR	x 80 =	0.00			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1	minus 3 = *				x 420 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00			
			TOTAL			TOTAL	1600			
* If the difference in column 1 is less than zero, enter "0" in column 2.										
APPLICATION AS AMENDED - PART II										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OTHER THAN SMALL ENTITY		
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)	RATE(\$)	ADDITIONAL FEE(\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)	RATE(\$)	ADDITIONAL FEE(\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.										

Power of Attorney to Prosecute Applications Before the USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached transmittal letter or application data sheet.

I hereby appoint Practitioner(s) associated with the following Customer Number:

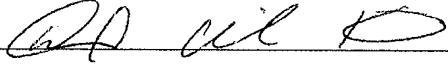
Customer Number: 27543

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications filed for the undersigned as applicant under 37 CFR 1.46 and including the application identified in the attached transmittal letter or application data sheet.

Please direct all correspondence in this case to the address associated with:

Customer Number: 27543

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee or obligated assignee.

Applied Optoelectronics, Inc.	
Applicant Name	
13115 Jess Pirtle Blvd., Sugar Land, TX 77478	
Applicant Address	
Signature 	Date 9/24/2012
Name and Title (of individual signing on behalf of assignee or obligated assignee)	
David Kuo, Assistant General Counsel	

Declaration for United States Patent Application

**TITLE OF APPLICATION: MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING
DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL
SUBASSEMBLIES IN THE TRANSCEIVER MODULE**

As a below named inventor, I hereby declare that:

This declaration is directed to:

☒ the attached application, or

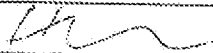
☐ United States Application No. or PCT Application No. _____ filed on _____

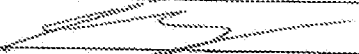
The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I have reviewed and understand the contents of the application, including the claims, and I am aware of the duty to disclose to the Office all information known to the person to be material to patentability as defined in 37 C.F.R. § 1.56 (attached hereto).

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

Ho, I-Lung Full name of sole or first inventor	
Sole or first inventor's signature 	Date 12/5/12

Murry, Stefan J. Full name of additional inventor, if any	
Additional inventor's signature 	Date 10/12/12

Yeh, (Richard) Che-Shou Full name of additional inventor, if any	
Additional inventor's signature Yeh, CHE SHOU	Date 12/5/12

§ 1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is canceled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is canceled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

- (1) prior art cited in search reports of a foreign patent office in a counterpart application, and
- (2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

- (1) It establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or
- (2) It refutes, or is inconsistent with, a position the applicant takes in:
 - (i) Opposing an argument of unpatentability relied on by the Office, or
 - (ii) Asserting an argument of patentability.

A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

- (1) Each inventor named in the application;
- (2) Each attorney or agent who prepares or prosecutes the application; and
- (3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.

**MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER
TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL
SUBASSEMBLIES IN THE TRANSCEIVER MODULE**

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application is a divisional of U.S. patent application Serial No. 13/709,195 filed December 10, 2012, which is fully incorporated herein by reference.

TECHNICAL FIELD

[0002] The present disclosure relates to multi-channel optical transceiver modules and more particularly, to a multi-channel transceiver module including a dual fiber type direct link adapter for optically coupling optical subassemblies in the transceiver module.

BACKGROUND INFORMATION

[0003] Optical communications networks, at one time, were generally “point to point” type networks including a transmitter and a receiver connected by an optical fiber. Such networks are relatively easy to construct but deploy many fibers to connect multiple users. As the number of subscribers connected to the network increases and the fiber count increases rapidly, deploying and managing many fibers becomes complex and expensive.

[0004] A passive optical network (PON) addresses this problem by using a single “trunk” fiber from a transmitting end of the network, such as an optical line terminal (OLT), to a remote branching point, which may be up to 20 km or more. One challenge in developing such a PON is utilizing the capacity in the trunk fiber efficiently in order to transmit the maximum possible amount of information on the trunk fiber. Fiber optic communications networks may increase the amount of information carried on a single optical fiber by multiplexing different optical signals on different wavelengths using wavelength division multiplexing (WDM). In a WDM-PON, for example, the single trunk fiber carries optical signals at multiple channel wavelengths to and from the optical branching point and the branching point provides a simple routing

function by directing signals of different wavelengths to and from individual subscribers. In this case, each subscriber may be assigned one or more of the channel wavelengths on which to send and/or receive data.

[0005] To transmit and receive optical signals over multiple channel wavelengths, the OLT in a WDM-PON may include a multi-channel transmitter optical subassembly (TOSA) and a multi-channel receiver optical subassembly (ROSA). The multi-channel TOSA and the multi-channel ROSA may be connected to external optical fibers that carry the transmitted and received optical signals. Optical connectors, such as LC connectors, may be provided at the ends of the optical fibers for connecting the optical fibers to the respective multi-channel TOSA and multi-channel ROSA. OLT transceiver modules often are designed to fit a relatively small form factor. One challenge with such OLT transceiver modules is accommodating the multi-channel TOSA and ROSA in the relatively small space available in an OLT module. In particular, certain components that may be used to provide optical connections to the TOSA and ROSA, such as conventional LC adapters, may not fit within the limited space.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] These and other features and advantages will be better understood by reading the following detailed description, taken together with the drawings wherein:

[0007] FIG. 1 is a functional block diagram of a wavelength division multiplexed (WDM) passive optical network (PON) including at least one multi-channel optical transceiver, consistent with embodiments of the present disclosure.

[0008] FIG. 2 is an exploded view of a multi-channel optical transceiver including a dual fiber type direct link adapter for optically coupling directly to a TOSA and a ROSA, consistent with an embodiment of the present disclosure.

[0009] FIG. 3 is a top view inside the multi-channel optical transceiver shown in FIG. 2.

[0010] FIG. 4 is a perspective view of one embodiment of the dual fiber type direct link adapter for coupling to first and second LC connectors.

[0011] FIGS. 5 and 6 are perspective views of the dual fiber type direct link adapter shown in FIG. 4 without the first and second LC connectors.

[0012] FIG. 7 is an exploded view of the dual fiber type direct link adapter shown in FIG. 4 illustrating the LC optical connecting portion.

[0013] FIG. 8 is a cross-sectional exploded view of the LC optical connecting portion of the dual fiber type direct link adapter shown in FIG. 4.

[0014] FIGS. 9 and 10 are cross-sectional views of the dual fiber type direct link adapter shown in FIG. 4 with the LC connector disconnected and connected.

DETAILED DESCRIPTION

[0015] A multi-channel optical transceiver, consistent with embodiments described herein, generally includes a multi-channel transmitter optical subassembly (TOSA), a multi-channel receiver optical subassembly (ROSA), and a dual fiber type direct link adapter directly linked to the multi-channel TOSA and the multi-channel ROSA with optical fibers. The dual fiber type direct link adapter is also configured to receive pluggable optical connectors, such as LC connectors, mounted at the end of fiber-optic cables including optical fibers for carrying optical signals to and from the transceiver. The dual fiber type direct link adapter thus provides the optical input and output to the transceiver for the optical signals received by the ROSA and transmitted by the TOSA. The multi-channel optical transceiver may be used in a wavelength division multiplexed (WDM) optical system, for example, in an optical line terminal (OLT) in a WDM passive optical network (PON).

[0016] As used herein, “channel wavelengths” refer to the wavelengths associated with optical channels and may include a specified wavelength band around a center wavelength. In one example, the channel wavelengths may be defined by an International Telecommunication (ITU) standard such as the ITU-T dense wavelength division multiplexing (DWDM) grid. The term “coupled” as used herein refers to any connection, coupling, link or the like by which signals carried by one system element are imparted to the “coupled” element and “optically coupled” refers to coupling such that light from one element is imparted to another element. Such “coupled” devices are not necessarily directly connected to one another and may be separated by intermediate components or devices that may manipulate or modify such signals. As used herein, “direct link” refers to optically coupling with a single optical fiber mechanically coupled between two components without using pluggable connectors at the ends of the fiber link.

[0017] Referring to FIG. 1, a WDM-PON 100 including one or more multi-channel optical transceivers 102a, 102b, consistent with embodiments of the present disclosure, is shown and described. The WDM-PON 100 provides a point-to-multipoint optical network architecture using a WDM system. According to one embodiment of the WDM-PON 100, at least one optical line terminal (OLT) 110 may be coupled to a plurality of optical networking terminals (ONTs) or optical networking units (ONUs) 112-1 to 112-n via optical fibers, waveguides, and/or paths 114, 115-1 to 115-n. Although the OLT 110 includes two multi-channel optical transceivers 102a, 102b in the illustrated embodiment, the OLT 110 may include one or more multi-channel optical transceivers.

[0018] The OLT 110 may be located at a central office of the WDM-PON 100, and the ONUs 112-1 to 112-n may be located in homes, businesses or other types of subscriber location or premises. A branching point 113 (e.g., a remote node) couples a trunk optical path 114 to the separate optical paths 115-1 to 115-n to the ONUs 112-1 to 112-n at the respective subscriber locations. The branching point 113 may include one or more passive coupling devices such as a splitter or optical multiplexer/demultiplexer. In one example, the ONUs 112-1 to 112-n may be located about 20 km or less from the OLT 110.

[0019] The WDM-PON 100 may also include additional nodes or network devices, such as Ethernet PON (EPON) or Gigabit PON (GPON) nodes or devices, coupled between the branching point 113 and ONUs 112-1 to 112-n at different locations or premises. One application of the WDM-PON 100 is to provide fiber-to-the-home (FTTH) or fiber-to-the-premises (FTTP) capable of delivering voice, data, and/or video services across a common platform. In this application, the central office may be coupled to one or more sources or networks providing the voice, data and/or video.

[0020] In the WDM-PON 100, different ONUs 112-1 to 112-n may be assigned different channel wavelengths for transmitting and receiving optical signals. In one embodiment, the WDM-PON 100 may use different wavelength bands for transmission of downstream and upstream optical signals relative to the OLT 110 to avoid interference between the received signal and back reflected transmission signal on the same fiber. For example, the L-band (e.g., about 1565 to 1625 nm) may be used for downstream transmissions from the OLT 110 and the C-band (e.g., about 1530 to 1565 nm) may be used for upstream transmissions to the OLT 110. The upstream and/or downstream channel wavelengths may generally correspond to the ITU

grid. In one example, the upstream wavelengths may be aligned with the 100 GHz ITU grid and the downstream wavelengths may be slightly offset from the 100 GHz ITU grid.

[0021] The ONUs 112-1 to 112-n may thus be assigned different channel wavelengths within the L-band and within the C-band. Transceivers or receivers located within the ONUs 112-1 to 112-n may be configured to receive an optical signal on at least one channel wavelength in the L-band (e.g., λ_{L1} , λ_{L2} , ... λ_{Ln}). Transceivers or transmitters located within the ONUs 112-1 to 112-n may be configured to transmit an optical signal on at least one channel wavelength in the C-band (e.g., λ_{C1} , λ_{C2} , ... λ_{Cn}). Other wavelengths and wavelength bands are also within the scope of the system and method described herein.

[0022] The branching point 113 may demultiplex a downstream WDM optical signal (e.g., λ_{L1} , λ_{L2} , ... λ_{Ln}) from the OLT 110 for transmission of the separate channel wavelengths to the respective ONUs 112-1 to 112-n. Alternatively, the branching point 113 may provide the downstream WDM optical signal to each of the ONUs 112-1 to 112-n and each of the ONUs 112-1 to 112-n separates and processes the assigned optical channel wavelength. The individual optical signals may be encrypted to prevent eavesdropping on optical channels not assigned to a particular ONU. The branching point 113 also combines or multiplexes the upstream optical signals from the respective ONUs 112-1 to 112-n for transmission as an upstream WDM optical signal (e.g., λ_{C1} , λ_{C2} , ... λ_{Cn}) over the trunk optical path 114 to the OLT 110.

[0023] One embodiment of the ONU 112-1 includes a laser 116, such as a laser diode, for transmitting an optical signal at the assigned upstream channel wavelength (λ_{C1}) and a photodetector 118, such as a photodiode, for receiving an optical signal at the assigned downstream channel wavelength (λ_{L1}). The laser 116 may include a tunable laser configured to be tuned to the assigned channel wavelength. This embodiment of the ONU 112-1 may also include a diplexer 117 coupled to the laser 116 and the photodetector 118 and a C + L band filter 119 coupled to the diplexer 117, which allow the L-band channel wavelength (λ_{L1}) to be received by the ONU 112-1 and the C-band channel wavelength (λ_{C1}) to be transmitted by the ONU 112-1.

[0024] The OLT 110 may be configured to generate multiple optical signals at different channel wavelengths (e.g., λ_{L1} , λ_{L2} , ... λ_{Ln}) and to combine the optical signals into the downstream WDM optical signal carried on the trunk optical fiber or path 114. Each of the OLT multi-channel optical transceivers 102a, 102b may include a multi-channel transmitter optical

sub-assembly (TOSA) 120 for generating and combining the optical signals at the multiple channel wavelengths. The OLT 110 may also be configured to separate optical signals at different channel wavelengths (e.g., λ_{C1} , λ_{C2} , ... λ_{Cn}) from an upstream WDM optical signal carried on the trunk path 114 and to receive the separated optical signals. Each of the OLT multi-channel optical transceivers 102a, 102b may thus include a multi-channel receiver optical sub-assembly (ROSA) 130 for separating and receiving the optical signals at multiple channel wavelengths.

[0025] One embodiment of the multi-channel TOSA 120 includes an array of lasers 122, such as laser diodes, which may be modulated by respective RF data signals (TX_D1 to TX_Dm) to generate the respective optical signals. The lasers 122 may be modulated using various modulation techniques including external modulation and direct modulation. An optical multiplexer 124, such as an arrayed waveguide grating (AWG), combines the optical signals at the different respective downstream channel wavelengths (e.g., λ_{L1} , λ_{L2} , ... λ_{Lm}). In some embodiments, the lasers 122 may be tunable lasers that generate the optical signals at the respective channel wavelengths. In other embodiments, the lasers 122 may generate optical signals over a band of channel wavelengths and filtering and/or multiplexing techniques may be used to produce the assigned channel wavelengths. In the illustrated embodiment, the OLT 110 further includes a multiplexer 104 for multiplexing the multiplexed optical signal from the multi-channel TOSA 120 in the multi-channel transceiver 102a with a multiplexed optical signal from a multi-channel TOSA in the other multi-channel transceiver 102b to produce the downstream aggregate WDM optical signal.

[0026] One embodiment of the multi-channel ROSA 130 includes a demultiplexer 132 for separating the respective upstream channel wavelengths (e.g., λ_{C1} , λ_{C2} , ... λ_{Cn}). An array of photodetectors 134, such as photodiodes, detects the optical signals at the respective separated upstream channel wavelengths and provides the received data signals (RX_D1 to RX_Dm). In the illustrated embodiment, the OLT 110 further includes a demultiplexer 106 for demultiplexing the upstream WDM optical signal into first and second WDM optical signals provided to the respective multi-channel ROSA in each of the transceivers 102a, 102b. The OLT also includes a diplexer 108 between the trunk path 114 and the multiplexer 104 and the demultiplexer 106 such that the trunk path 114 carries both the upstream and the downstream channel wavelengths. The

transceivers 102a, 102b may also include other components such as laser drivers, transimpedance amplifiers (TIAs), and control interfaces used for transmitting and receiving optical signals.

[0027] In one example, each of the multi-channel optical transceivers 102a, 102b may be configured to transmit and receive 16 channels such that the WDM-PON 100 supports 32 downstream L-band channel wavelengths and 32 upstream C-band channel wavelengths. In one example, the downstream L-band link between the OLT transceivers 102a, 102b and the ONUs 112-1 to 112-n may support a power budget of at least about 26 dB and the upstream C-band link between the ONUs 112-1 to 112-n and the OLT transceivers 102a, 102b may support a power budget of at least about 23 dB. One example of the WDM-PON 100 may operate at 1.25 Gbaud using 8B/10B encoded on-off keying as the modulation scheme. Other data rates and modulation schemes may also be used.

[0028] As mentioned above, the upstream and downstream channel wavelengths may span a range of channel wavelengths on the 100 GHz ITU grid. Each of the transceivers 102a, 102b, for example, may cover 16 channel wavelengths in the L-band for the TOSA and 16 channel wavelengths in the C-band for the ROSA such that the transceivers 102a, 102b together cover 32 channels. Thus, the multiplexer 104 may combine 16 channels from one transceiver 102a with 16 channels from the other transceiver 102b, and the demultiplexer 106 may separate a 32 channel WDM optical signal into two 16 channel WDM optical signals. To facilitate use of the multiplexer 104 and the demultiplexer 106, the range of channel wavelengths may skip channels (e.g., 2 channels) in the middle of the range.

[0029] Referring to FIGS. 2 and 3, one embodiment of a multi-channel optical transceiver module 202 is shown and described in greater detail. As discussed above, multiple multi-channel transceiver modules may be used in an OLT of a WDM-PON to cover a desired channel range. The transceiver module 202 may thus be designed to have a relatively small form factor with minimal space within the transceiver module 202. The multi-channel optical transceiver module 202 generally provides an optical input and output at one end 204 and electrical input and output at another end 206. The transceiver module 202 includes a transceiver housing 210 containing a multi-channel TOSA 220, a multi-channel ROSA 230, and a dual fiber type direct link adapter 250 directly linked to the TOSA 220 and the ROSA 230 for providing the optical input and output.

[0030] The dual fiber type direct link adapter 250 is coupled to the TOSA 220 and to the ROSA 230 with respective optical fibers 222, 232 to provide the direct link between the adapter 250 and both the TOSA 220 and the ROSA 230. The dual fiber type direct link adapter 250 is also configured to receive pluggable optical connectors 320, 330, such as LC connectors, which terminate fiber optic cables 322, 332. When the optical connectors 320, 330 are plugged into the dual fiber type direct link adapter 250, the adapter 250 establishes an optical coupling between the TOSA 220 and the ROSA 230 and the respective optical fibers in the fiber-optic cables 322, 332, which carry the optical signals to and from the transceiver.

[0031] The dual fiber type direct link adapter 250 has a direct link end 252 mechanically coupled to the optical fibers 222, 232 and a pluggable connector end 254 configured to receive the pluggable optical connectors 320, 330. The direct link end 252 of the dual fiber type direct link adapter 250 is located inside the transceiver housing 210 and the pluggable connector end 254 faces outside of the transceiver housing 210. The illustrated embodiment of the dual fiber type direct link adapter 250 also includes one or more flanges 256 or other structures that engage the transceiver housing 210 and secure the adapter 250 within the housing 210.

[0032] The transceiver module 202 may also include one or more printed circuit boards 208 coupled to the TOSA 220 and/or ROSA 230. The printed circuit board(s) 208 may include electronic components such as laser drivers, transimpedance amplifiers (TIAs), and control interfaces. The TOSA 220 is coupled to conductive leads 224 for carrying the electronic signals including the data to be transmitted by the TOSA 220. The ROSA 230 is coupled to the conductive leads 234 for carrying the electronic signals including the data received by the ROSA 230.

[0033] A top housing portion 212 encloses the TOSA 220, the ROSA 230, the adapter 250, the optical fibers 222, 232, and other components within the housing 210. The transceiver housing 210 may have a width of less than about 55 mm, a length of less than about 130 mm, and a height of less than about 10 mm. To fit within this transceiver housing 210, the dual fiber type direct link adapter 250 may have a length from the direct link end 252 to the pluggable connector end 254 of less than about 30 mm. More specifically, one example of a transceiver housing 210 may have a width of 54.6 mm, a length of 110 mm, and a height of about 9.8 mm, and the direct link adapter 250 has a length of about 28 mm. A pull tab 214 may be coupled to the transceiver housing 210 to facilitate handling of the transceiver 202.

[0034] Referring to FIGS. 4-7, the dual fiber type direct link adapter 250 is described in greater detail. In the illustrated embodiment, the dual fiber type direct link adapter 250 includes an adapter body portion 260 defining first and second connector receiving regions 262, 264 at the pluggable connector end 254 and defining first and second slots 266, 268 at the direct link end 252. The first and second connector receiving regions 262, 264 are configured to receive the respective pluggable optical connectors 320, 330, such as LC connectors. The first and second slots 266, 268 are configured to receive respective direct link connector assemblies 270, 272, which are mechanically coupled to optical fibers (not shown) directly linking the TOSA and ROSA (not shown). An adapter cover portion 261 covers the slots 266, 268 and retains the direct link connector assemblies 266, 268. The direct link connector assemblies 270, 272 also include flange portions 274, 276 (shown in FIG. 7) that extend into receiving grooves 267, 269 in the respective slots 266, 268 to prevent axial movement and hold the direct link connector assemblies in the slots.

[0035] In one embodiment, the dual fiber type direct link adapter 250 is configured to mechanically and optically connect to an LC type optical connector. In other embodiments, the dual fiber type direct link adapter 250 may be configured to connect with other types of pluggable optical connectors. The optical connectors 320, 330 may be mechanically engaged with the dual fiber type direct link adapter 250 when plugged to maintain the optical coupling. The connector 330 includes, for example, a latch 334 that engages a corresponding portion within the adapter body portion 260.

[0036] One end of each of the direct link connector assemblies 270, 272 is mechanically coupled to the optical fibers to provide the direct link to the TOSA and ROSA, as described above. The other end of each of the direct link connector assemblies 270, 272 defines a connector receptacle that extends into the respective connector receiving region 262, 264 defined by the adapter body portion 260, as described in greater detail below.

[0037] FIG. 8 shows the direct link connector assembly 270/271 in greater detail. In this illustrated embodiment, the direct link connector assembly 270 includes an outer housing formed by first and second outer housing portions 280, 282 around a sleeve 284, which receives a fiber ferrule 286. A respective one of the optical fibers (not shown) may pass through an opening 281 in the first housing portion 280 and into the fiber ferrule 286. The optical fiber may be secured to the fiber ferrule 286 such that an end face of the optical fiber is located at an optical coupling

end 287 of the fiber ferrule 286. The second housing portion 282 and the sleeve 284 define a connector receptacle 285 at the connector coupling end, which receives a fiber ferrule of a pluggable optical connector (not shown) through an opening 283.

[0038] FIGS. 9 and 10 illustrate the connection of a pluggable optical connector 320 (e.g., an LC connector) to the dual fiber type direct link adapter 250. As shown in FIG. 9 and described above, the direct link connector assembly 270 defines a connector receptacle 285 that extends into the connector receiving region 262. The direct link optical fiber 236 extends into the connector assembly 270 and is secured to the fiber ferrule 286 with an end face of the optical fiber 236 exposed for optical coupling. The pluggable optical connector 320 includes a fiber ferrule 326 extending from one end. The optical fiber 328 in the fiber-optic cable 322 coupled to the optical connector 320 extends into the connector 320 and is secured to the fiber ferrule 286 with an end face of the optical fiber 328 exposed for optical coupling.

[0039] As shown in FIG. 10, when the optical connector 320 is plugged into the dual fiber type direct link adapter 250, the connector fiber ferrule 326 extends into the connector receptacle 285 and contacts the adapter fiber ferrule 286 such that optical coupling is established between the optical fibers 328, 236. In the illustrated embodiment, the pluggable optical connector 320 is an LC type optical connector and the connector assembly 270 (and connector receptacle 285) is configured to mate with an LC type optical connector.

[0040] Accordingly, a dual fiber type direct link adapter, consistent with embodiments described herein, allows connection to a pluggable optical connector, such as an LC connector, while providing a direct optical link to both the TOSA and ROSA in a multi-channel optical transceiver. The direct link connection reduces the size of the adapter and allows a smaller transceiver module with a pluggable optical input and output.

[0041] Consistent with an embodiment, a multi-channel transceiver module includes a transceiver housing, a multi-channel transmitter optical subassembly (TOSA) located in the transceiver housing and configured to transmit a wavelength division multiplexed (WDM) optical signal on multiple channel wavelengths, and a multi-channel receiver optical subassembly (ROSA) located in the transceiver housing and configured to receive a wavelength division multiplexed (WDM) optical signal on multiple channel wavelengths. A dual fiber type direct link adapter is located inside the transceiver housing and at one side of the transceiver housing. The dual fiber type direct link adapter has a direct link end located in the transceiver

housing and a pluggable connector end facing outside of the transceiver housing. The direct link end of the dual fiber type direct link adapter is coupled to the TOSA with a first optical fiber and coupled to the ROSA with a second optical fiber to provide a direct link between the dual fiber type direct link adapter and the TOSA and the ROSA. The pluggable connector end is configured to receive first and second pluggable optical connectors for optically coupling the TOSA and the ROSA to external optical fibers.

[0042] Consistent with another embodiment, a dual fiber type direct link LC adapter includes an adapter body portion defining first and second LC connector receiving regions at an pluggable connector end and defining first and second slots at a direct link end. The dual fiber type direct link LC adapter includes also includes first and second direct link connector assemblies configured to be received in the first and second slots, respectively. Each of the direct link connector assemblies defines an LC connector receptacle at one end. The LC connector receptacle extends into a respective one of the LC connector receiving regions and is configured to receive a portion of an LC connector for optical coupling. Each of the direct link connector assemblies is configured to be mechanically coupled to an optical fiber at another end. The dual fiber type direct link LC adapter further includes an adapter cover portion configured to cover the first and second slots for retaining the direct link connector assemblies in the respective slots.

[0043] Consistent with a further embodiment, an optical line terminal comprises at least first and second multi-channel transceivers. Each of the multi-channel transceivers includes a transceiver housing, a multi-channel transmitter optical subassembly (TOSA) located in the transceiver housing and configured to transmit a wavelength division multiplexed (WDM) optical signal on multiple channel wavelengths, and a multi-channel receiver optical subassembly (ROSA) located in the transceiver housing and configured to receive a wavelength division multiplexed (WDM) optical signal on multiple channel wavelengths. A dual fiber type direct link adapter is located inside the transceiver housing and at one side of the transceiver housing. The dual fiber type direct link adapter has a direct link end located in the transceiver housing and a pluggable connector end facing outside of the transceiver housing. The direct link end of the dual fiber type direct link adapter is coupled to the TOSA with a first optical fiber and coupled to the ROSA with a second optical fiber to provide a direct link between the dual fiber type direct link adapter and the TOSA and the ROSA. The pluggable connector end is

configured to receive first and second pluggable optical connectors for optically coupling the TOSA and the ROSA to external optical fibers.

[0044] While the principles of the invention have been described herein, it is to be understood by those skilled in the art that this description is made only by way of example and not as a limitation as to the scope of the invention. Other embodiments are contemplated within the scope of the present invention in addition to the exemplary embodiments shown and described herein. Modifications and substitutions by one of ordinary skill in the art are considered to be within the scope of the present invention, which is not to be limited except by the following claims.

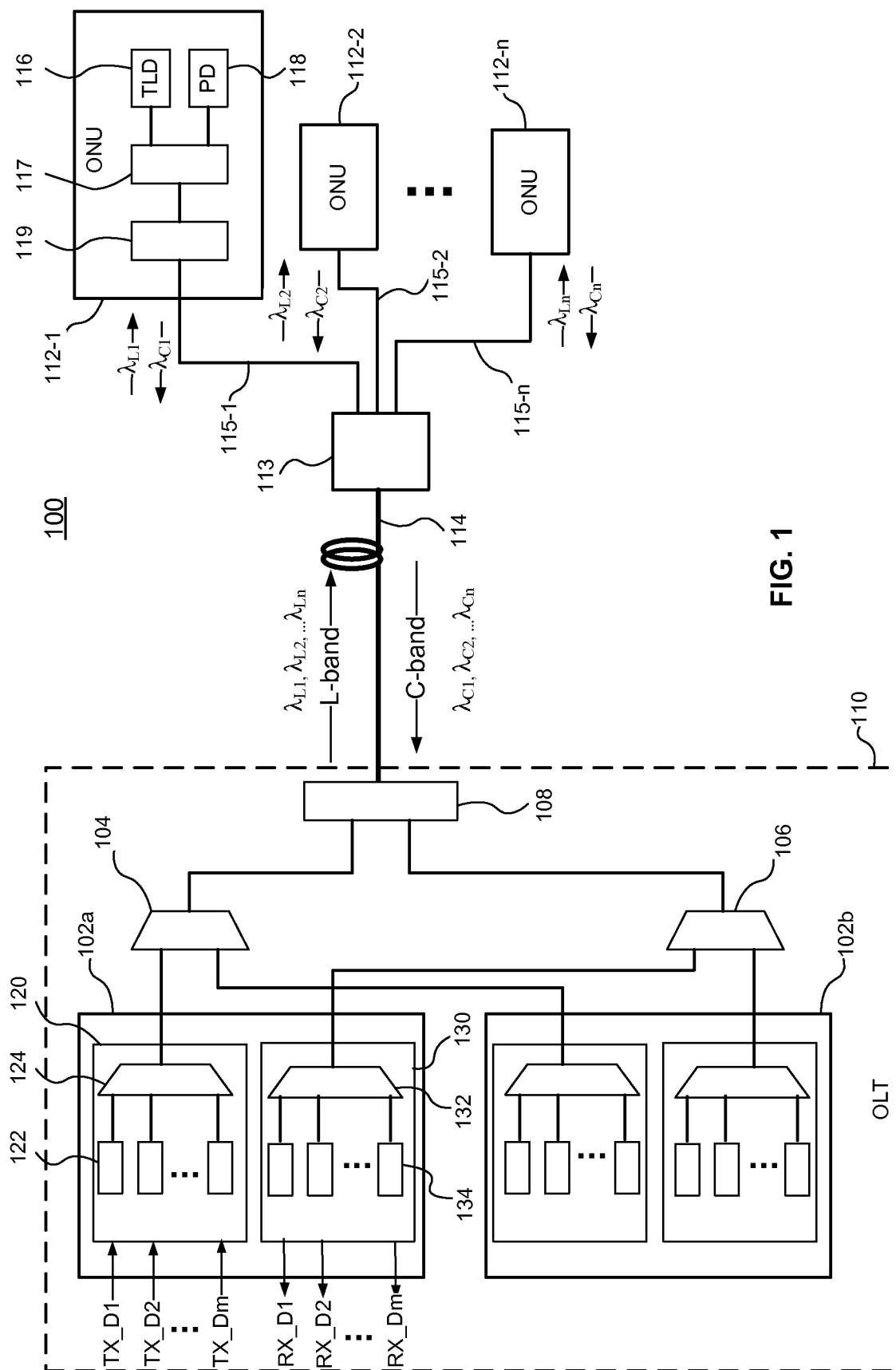
CLAIMS

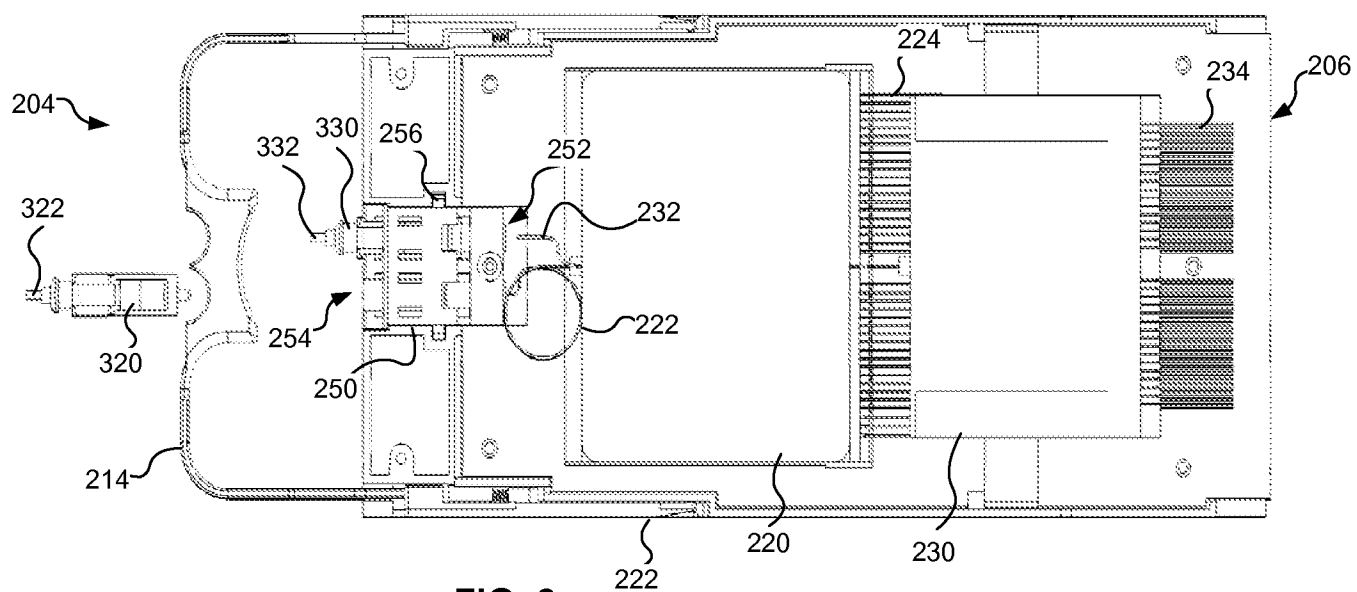
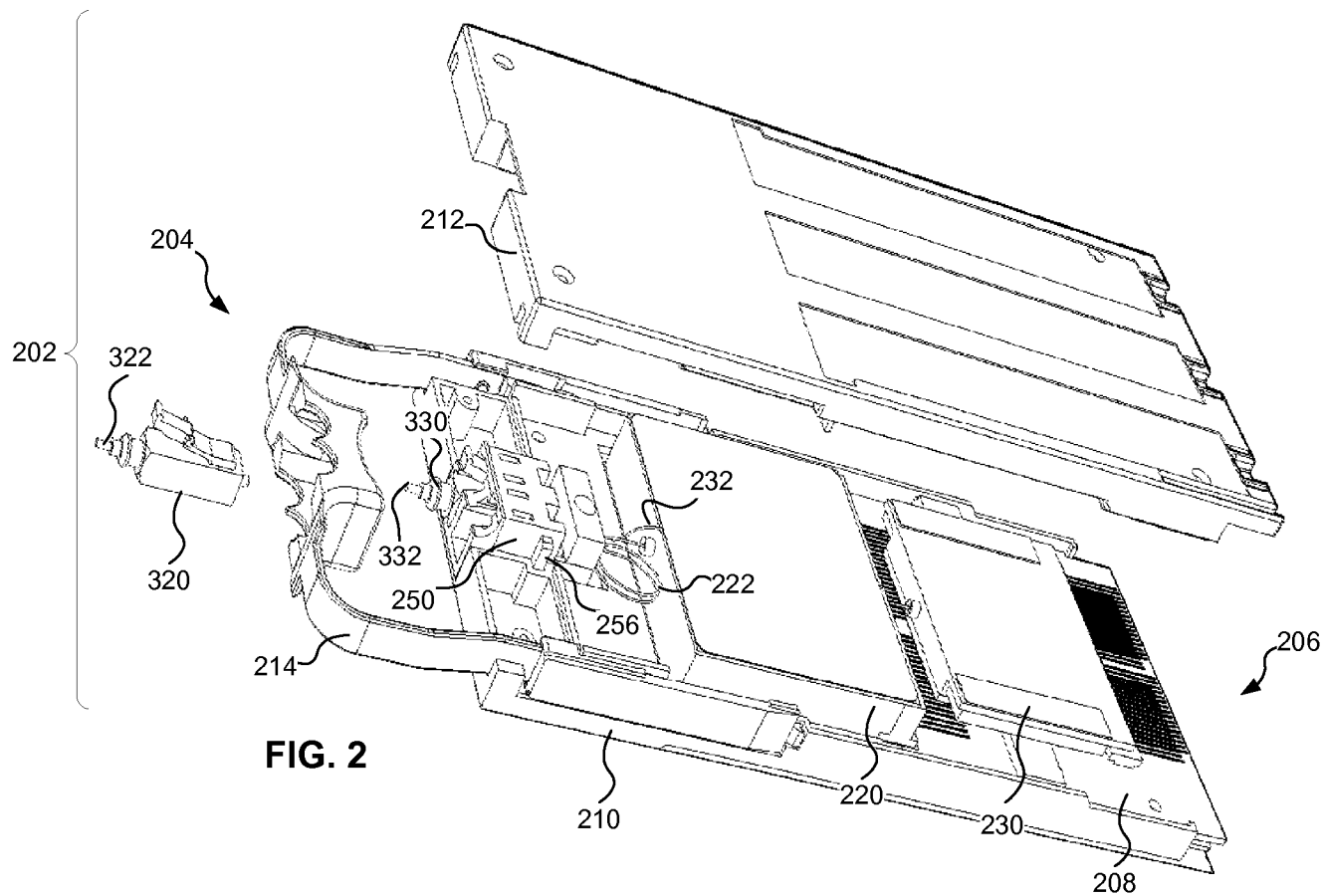
What is claimed is:

1. A dual fiber type direct link LC adapter comprising:
an adapter body portion defining first and second LC connector receiving regions at an pluggable connector end and defining first and second slots at a direct link end;
first and second direct link connector assemblies configured to be received in the first and second slots, respectively, each of the direct link connector assemblies defining an LC connector receptacle at one end, wherein the LC connector receptacle extends into a respective one of the LC connector receiving regions and is configured to receive a portion of an LC connector for optical coupling, and wherein each of the direct link connector assemblies is configured to be mechanically coupled to an optical fiber at another end, and
an adapter cover portion configured to cover the first and second slots for retaining the direct link connector assemblies in the respective slots.
2. The dual fiber type direct link LC adapter of claim 1, wherein each of the direct link connector assemblies include a fiber ferrule for receiving the optical fiber and a sleeve around the fiber ferrule for defining at least a portion of the LC connector receptacle.
3. The dual fiber type direct link LC adapter of claim 1 wherein a length of the dual fiber type direct link adapter from the direct link end to the pluggable connector end is less than 30 mm.
4. The dual fiber type direct link LC adapter of claim 1 wherein each of the direct link connector assemblies further comprises an outer housing around the fiber ferrule and sleeve, the outer housing defining at least a portion of the connector receptacle and including a flange portion for securing the direct link connector assembly.

ABSTRACT

A multi-channel optical transceiver includes a multi-channel transmitter optical subassembly (TOSA), a multi-channel receiver optical subassembly (ROSA), and a dual fiber type direct link adapter directly linked to the multi-channel TOSA and the multi-channel ROSA with optical fibers. The dual fiber type direct link adapter is also configured to receive pluggable optical connectors, such as LC connectors, mounted at the end of fiber-optic cables including optical fibers for carrying optical signals to and from the transceiver. The dual fiber type direct link adapter thus provides the optical input and output to the transceiver for the optical signals received by the ROSA and transmitted by the TOSA. The multi-channel optical transceiver may be used in a wavelength division multiplexed (WDM) optical system, for example, in an optical line terminal (OLT) in a WDM passive optical network (PON).





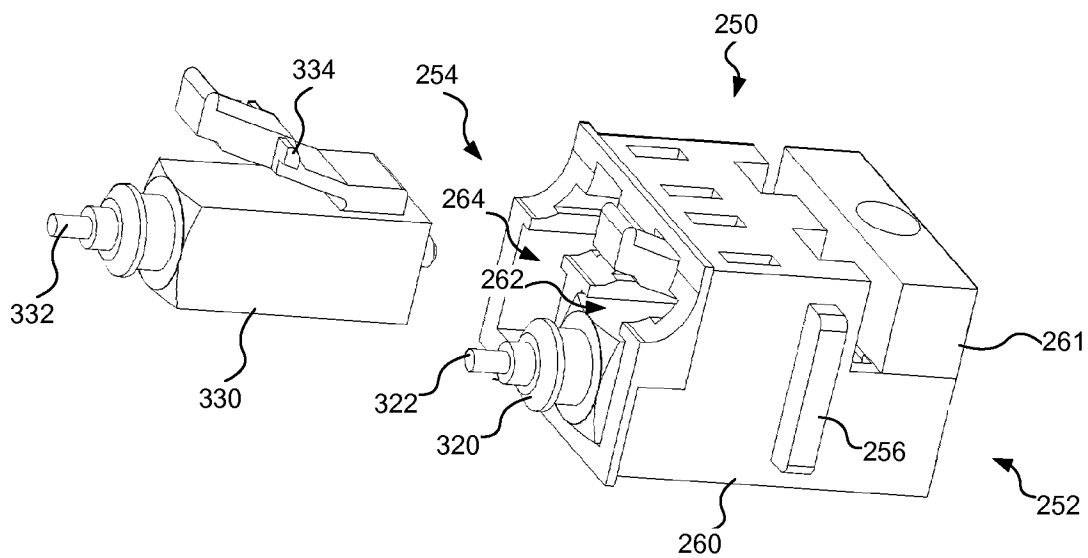


FIG. 4

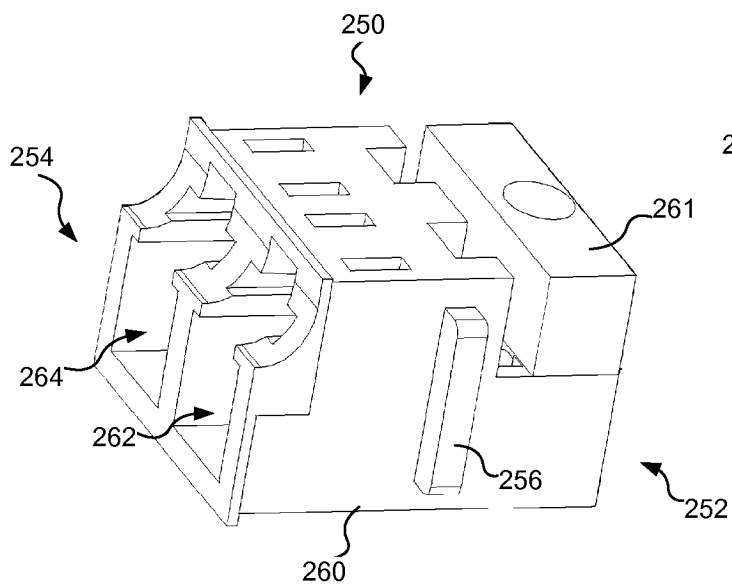


FIG. 5

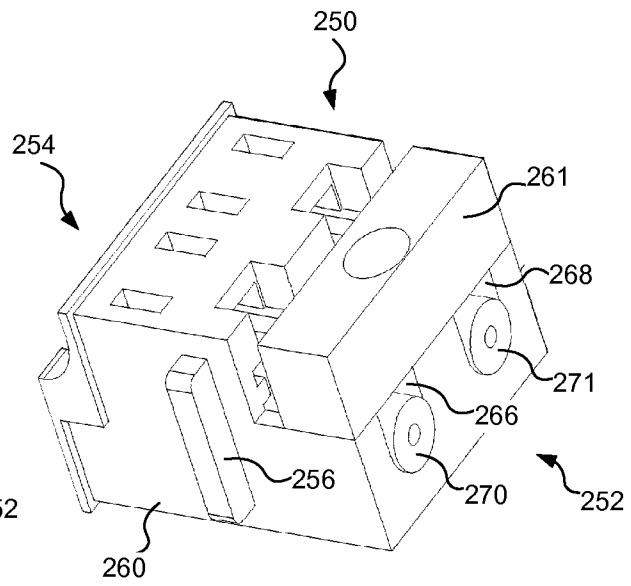


FIG. 6

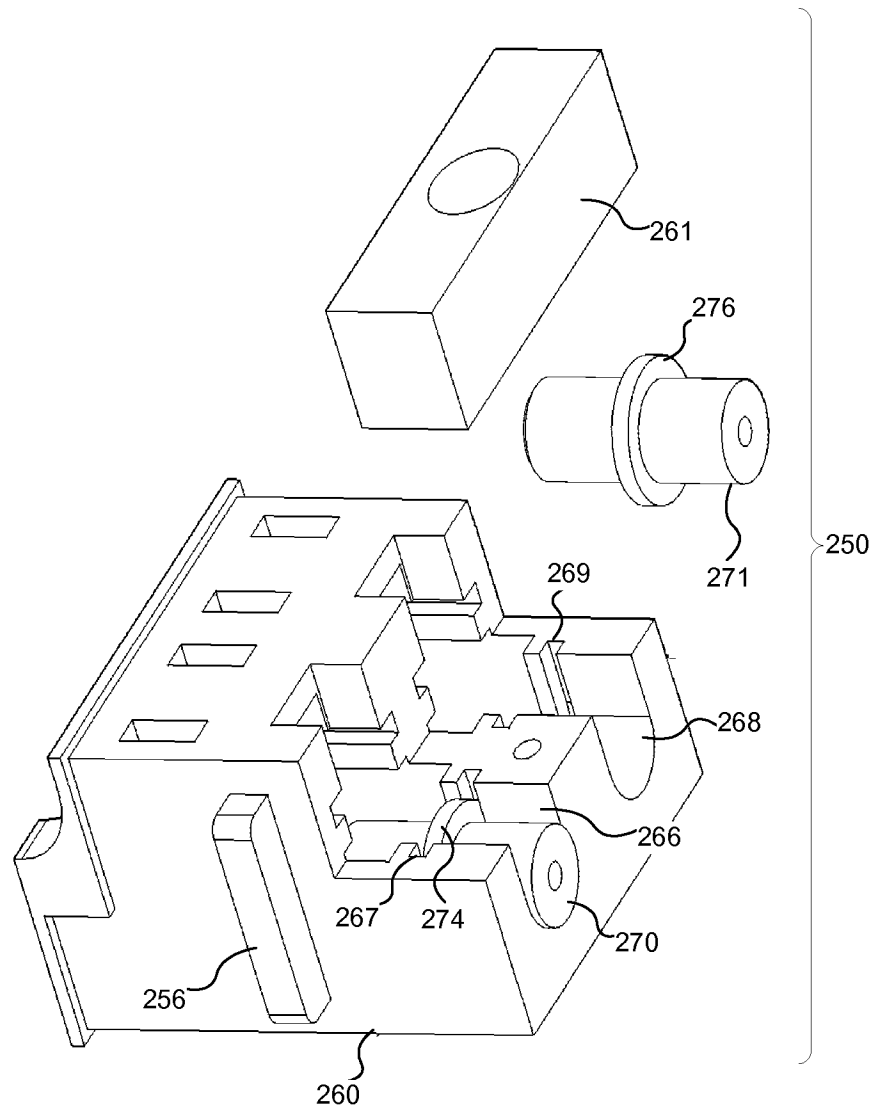


FIG. 7

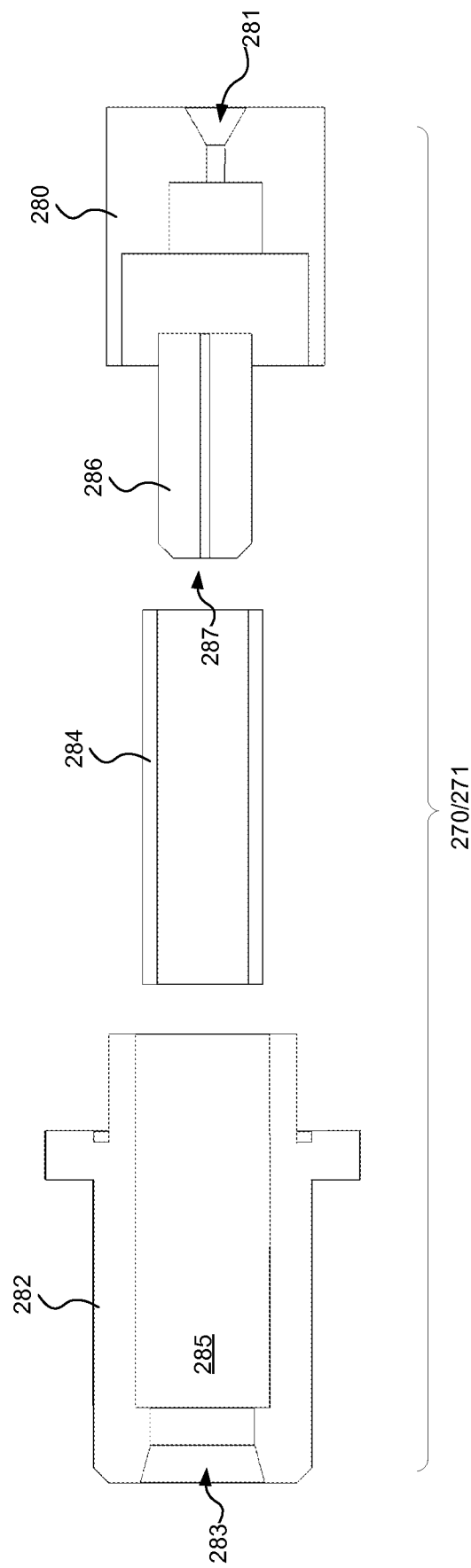


FIG. 8

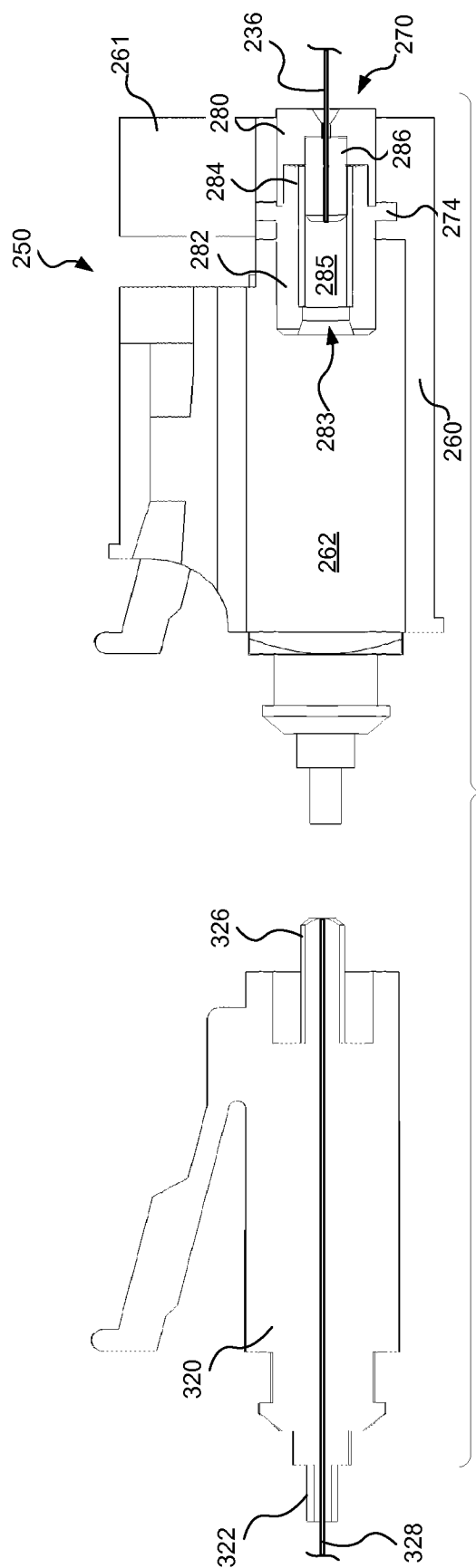


FIG. 9

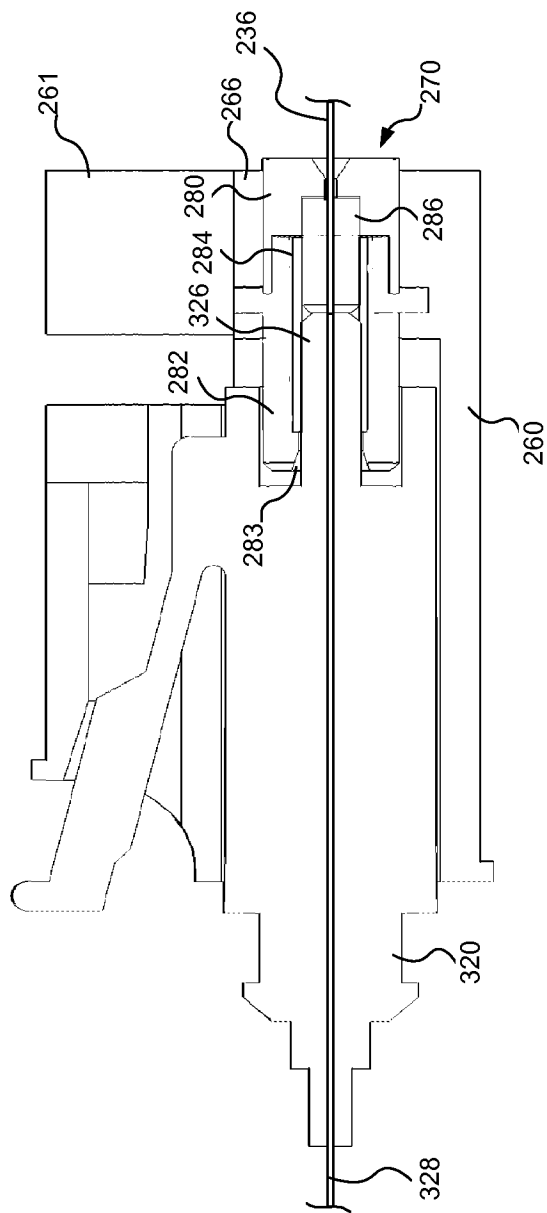


FIG. 10

Electronic Patent Application Fee Transmittal

Application Number:				
Filing Date:				
Title of Invention:	MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE			
First Named Inventor/Applicant Name:	I-Lung HO			
Filer:	Kevin J. Carroll/April Davis			
Attorney Docket Number:	PAT165USDIV			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility application filing	1011	1	280	280
Utility Search Fee	1111	1	600	600
Utility Examination Fee	1311	1	720	720
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1600

Electronic Acknowledgement Receipt

EFS ID:	23793808
Application Number:	14883970
International Application Number:	
Confirmation Number:	4834
Title of Invention:	MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE
First Named Inventor/Applicant Name:	I-Lung HO
Customer Number:	27543
Filer:	Kevin J. Carroll/April Davis
Filer Authorized By:	Kevin J. Carroll
Attorney Docket Number:	PAT165USDIV
Receipt Date:	15-OCT-2015
Filing Date:	
Time Stamp:	14:13:12
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$ 1600
RAM confirmation Number	430
Deposit Account	501705
Authorized User	CARROLL, KEVIN J.

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

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 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	Application Data Sheet	PAT165USDIV_ADS_aia0014.pdf	1561721	no	7
			b513576c8959d2ed8391eca360bc4f066c7878a4		
Warnings:					
Information:					
2	Power of Attorney	POWER_OF_ATTORNEY.pdf	41668	no	1
			8aabb5832cb1864c489c73e9d2f4bc75fb6e4707		
Warnings:					
Information:					
3	Oath or Declaration filed	PAT165USDIV_Declaration_asfiled.pdf	653105	no	2
			efaa2ae71c85f2984f4a345349dfe456cca82aef		
Warnings:					
Information:					
4		PAT165USDIV_Application_asfiled_101515.pdf	80797	yes	14
			25088e6946ec26e23a0fe88f84151cda28c29deb		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	12	
	Claims		13	13	
	Abstract		14	14	
Warnings:					
Information:					
5	Drawings-only black and white line drawings	PAT165USDIV_Drawings_asfiled_101515.pdf	832293	no	6
			ac35d8736aac2c19f58d26977c9a17e228018c14		
Warnings:					
Information:					
6	Fee Worksheet (SB06)	fee-info.pdf	35405	no	2
			76cddcc933800804db5675b864b526337d97e4cb		

Warnings:	
Information:	
Total Files Size (in bytes):	3204989
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. <u>New Applications Under 35 U.S.C. 111</u> 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. <u>National Stage of an International Application under 35 U.S.C. 371</u> 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. <u>New International Application Filed with the USPTO as a Receiving Office</u> 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.	

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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	PAT165USDIV
		Application Number	
Title of Invention	MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2

☐	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
--------------------------	---

Inventor Information:

Inventor 1					Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	I-Lung		HO		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Sugar Land	State/Province	TX	Country of Residence i	US

Mailing Address of Inventor:

Address 1	225 Fluor Daniel Drive, #7201				
Address 2					
City	Sugar Land	State/Province	TX		
Postal Code	77679	Country i	US		

Inventor 2					Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Stefan	J.	MURRY		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Houston	State/Province	TX	Country of Residence i	US

Mailing Address of Inventor:

Address 1	5719 Indigo Street				
Address 2					
City	Houston	State/Province	TX		
Postal Code	77096	Country i	US		

Inventor 3					Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Che-Shou (Richard)		YEH		
Residence Information (Select One) ☐ US Residency ☒ Non US Residency ☐ Active US Military Service					

Application Data Sheet 37 CFR 1.76		Attorney Docket Number		PAT165USDIV	
		Application Number			
Title of Invention		MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE			
City	New Taipei City		Country of Residence i		TW
Mailing Address of Inventor:					
Address 1		No.18, Gong 4th Rd., Linkou District			
Address 2					
City	New Taipei City		State/Province		
Postal Code	24452		Country i	TW	
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.					Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence information of this application.			
Customer Number	27543		
Email Address	kcarroll@gtpp.com	Add Email	Remove Email

Application Information:

Title of the Invention	MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE		
Attorney Docket Number	PAT165USDIV	Small Entity Status Claimed ☐	
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	6	Suggested Figure for Publication (if any)	

Filing By Reference :

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country i

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	PAT165USDIV
		Application Number	
Title of Invention	MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE		

Publication Information:

☐	Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐	Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.											
<table border="1"> <tr> <td>Please Select One:</td> <td>☒ Customer Number</td> <td>☐ US Patent Practitioner</td> <td>☐ Limited Recognition (37 CFR 11.9)</td> </tr> <tr> <td>Customer Number</td> <td colspan="3">27543</td> </tr> </table>				Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)	Customer Number	27543		
Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)								
Customer Number	27543										

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.			
When referring to the current application, please leave the application number blank.			
Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Division of	13709195	2012-12-10
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).			
Remove			
Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ⁱ (if applicable)

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	PAT165USDIV
		Application Number	
Title of Invention	MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE		

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	PAT165USDIV
		Application Number	
Title of Invention	MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE		

Applicant 1				Remove	
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.					
Clear					
☒ Assignee		☐ Legal Representative under 35 U.S.C. 117		☐ Joint Inventor	
☐ Person to whom the inventor is obligated to assign.			☐ Person who shows sufficient proprietary interest		
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:					
Name of the Deceased or Legally Incapacitated Inventor :					
If the Applicant is an Organization check here. ☒					
Organization Name		Applied Optoelectronics, Inc.			
Mailing Address Information:					
Address 1		13115 Jess Pirtle Blvd.			
Address 2					
City		Sugar Land	State/Province		TX
Country ⁱ	US	Postal Code		77478	
Phone Number			Fax Number		
Email Address					
Additional Applicant Data may be generated within this form by selecting the Add button. Add					

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.	
Assignee 1	
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.	
Remove	
If the Assignee or Non-Applicant Assignee is an Organization check here. ☐	

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	PAT165USDIV
		Application Number	
Title of Invention	MULTI-CHANNEL OPTICAL TRANSCEIVER MODULE INCLUDING DUAL FIBER TYPE DIRECT LINK ADAPTER FOR OPTICALLY COUPLING OPTICAL SUBASSEMBLIES IN THE TRANSCEIVER MODULE		

Prefix	Given Name	Middle Name	Family Name	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		State/Province	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Signature:

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

Signature	/Kevin J. Carroll/		Date (YYYY-MM-DD)	2015-10-15
First Name	Kevin	Last Name	Carroll	Registration Number
			36384	

Additional Signature may be generated within this form by selecting the Add button.

This collection of information is required by 37 CFR 1.76. 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 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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 the Freedom of Information Act requires disclosure of these records.
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 inspections 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.

SCORE Placeholder Sheet for IFW Content

Application Number: 14883970

Document Date: 10/15/2015

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

- Drawings – Other than Black and White Line Drawings

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

To access the documents in the SCORE database, refer to instructions below.

At the time of document entry (noted above):

- Examiners may access SCORE content via the eDAN interface.
- Other USPTO employees can bookmark the current SCORE URL (<http://Score.uspto.gov/ScoreAccessWeb/>).
- External customers may access SCORE content via the Public and Private PAIR interfaces.