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Kathi

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IPR2026-00093

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PAT.232.US

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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:

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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:

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

Applicant Name APPLIED OPTOELECTRONICS, INC.
Applicant Address 6F-1, No. 700, Jhongjheng Rd., Zhonghe Dist., New Taipei City, Taiwan, R.O.C.
Signature Chao-Hung Tsai Date 2014/09/30
Name and Title (of individual signing on behalf of assignee or obligated assignee)
Chao-Hung Tsai / VP - Vice President, Applied Optoelectronics, Inc.

Declaration for United States Patent Application

TITLE OF APPLICATION: PLUGGABLE OPTICAL TRANSCIEVER MODULE

As a below named inventor, I hereby declare that:

This declaration is directed to:
[X] 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.

Full name of sole or first inventor Chao-Hung TSAI	Chao-Hung Tsai
Sole or first inventor's signature	Date 2014/09/30

Full name of additional inventor, if any Chien-Te LIN	Chien-te Lin
Additional inventor's signature	Date 2014/09/30

Full name of additional inventor, if any Che-Shou YEH	Che-shou Yeh
Additional inventor's signature	Date 2014/9/30

§ 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.

PLUGGABLE OPTICL TRANSCEIVER MODULE

CROSS-REFERENCE TO RELATED APPLICATIONS

This non-provisional application claims priority under 35 U.S.C. § 119(a) on Patent Application No(s) 102135723. filed in Taiwan, R.O.C. on October 2nd, 2013, the entire contents of which are hereby incorporated by reference.

Technical Field

The disclosure relates to an optical communication component, more particularly to a pluggable optical transceiver module.

Background

An optical transceiver module is generally installed in an electronic communication facility in the modern high speed communication networks. In order to make the electronic communication facility flexible and easy to repair, the optical transceiver module is inserted into a corresponding socket disposed in the communication facility in a pluggable manner. In general, the socket is disposed on a circuit board. In order to define the electrical-to-mechanical interface of the optical transceiver module and the corresponding socket, different specifications have been provided such as XFP (10 Gigabit Small Form Factor Pluggable) used in 10 GB/s communication rate and QSFP (Quad Small Form-factor Pluggable).

A fastening mechanism is disposed in the socket corresponding to the optical transceiver module so that the optical transceiver module is securely fixed to the socket by the fastening mechanism. Therefore, it is indispensable that the optical transceiver module must have a releasing mechanism. This makes the optical transceiver module slip out from the socket by easily removing the lock.

On the other hand, a common communication facility, such as a hub, usually comprises

at least one optical transceiver module for converting optical signals into electronic signals. When the common communication facility is used for a long time, dusts may drop on the surface of common communication facility. Thus, dusts may also drop on the optical transceiver module without any appropriate protection when the optical fiber cable is connected or removed from the optical transceiver module. Consequently, the dusts may damage the optical transceiver module and affect the transmission of the signals.

In view of this, it is important to improve the convenient connection and disconnection between the optical transceiver module and the socket and its dust-proof function.

SUMMARY

The disclosure provides a pluggable optical transceiver module configured to be inserted into a plugging slot. The pluggable optical transceiver module comprises a main body and a sliding component. The main body has two side surfaces opposite to each other and two sliding slots. The two sliding slots are located at the two side surfaces. The main body is configured to be inserted into the plugging slot. The sliding component comprises a linkage arm and two extending arms. The two extending arms are connected to two ends of the linkage arm, respectively. Each extending arm has a second fastening part. The main body is between the two extending arms. The two extending arms are slidably disposed on the two sliding slots to have a fastening position and a releasing position. Two first fastening parts are fastened to the two second fastening parts when the two extending arms are located at the fastening position. The two second fastening parts press the two first fastening parts, respectively, to make the two first fastening parts be farther away from each other when the two extending arms are located at the releasing position.

BRIEF DESCRIPTION OF THE DRAWINGS

The present disclosure will become more fully understood from the detailed description and the drawings given herein below for illustration only, thus does not limit the present disclosure, wherein:

FIG. 1 is a perspective view of a pluggable optical transceiver module according to a first embodiment;

FIG. 2 is an exploded view of the pluggable optical transceiver module in FIG. 1;

FIG. 3 is another exploded view of the pluggable optical transceiver module in FIG. 1;

FIG. 4A is a cross-sectional view of the pluggable optical transceiver module in FIG. 1 when a sliding component is located at a fastening position;

FIG. 4B is a partial enlarged view of the pluggable optical transceiver module in FIG. 4A;

FIG. 5A is a cross-sectional view of the pluggable optical transceiver module in FIG. 1 when the sliding component is located at a releasing position;

FIG. 5B is a partial enlarged view of the pluggable optical transceiver module in FIG. 5A; and

FIG. 6 is a perspective view of the pluggable optical transceiver module in FIG. 2 when a pull handle pivots on a main body.

DETAILED DESCRIPTION

In the following detailed description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the disclosed embodiments. It will be apparent, however, that one or more embodiments may be practiced without these specific details. In other instances, well-known structures and devices are schematically shown in order to simplify the drawings.

FIG. 1 is a perspective view of a pluggable optical transceiver module according to a first embodiment. FIG. 2 is an exploded view of the pluggable optical transceiver module in FIG. 1. In the first embodiment, a pluggable optical transceiver module 10 is configured to be

inserted into a socket 20 to convert optical signals into electronic signals. The socket 20 has a plugging slot 22 and two first fastening parts 24. Each first fastening part 24 is elastic. One end of the first fastening part 24 is connected to a case of the socket 20 and the other end of the first fastening part 24 is located in the plugging slot 22. In this embodiment, the first fastening part 24 is an elastic slice.

FIG. 3 is another exploded view of FIG. 1. FIG. 4A is a cross-sectional view of FIG. 1 when a sliding component is located at a fastening position. FIG. 4B is a partial enlarged view of FIG. 4A.The pluggable optical transceiver module 10 comprises a main body 100, a sliding component 200, a pull handle 300 and two elastic components 400. The main body 100 comprises a head part 110 and an inserted part 120 that are connected to each other. The inserted part 120 is configured to be inserted into the plugging slot 22 of the socket 20. The main body 100 has two side surfaces 130, two sliding slots 140 and two limiting spaces 150. The two side surfaces 130 are located at opposite two sides of the head part 110 and the inserted part 120, respectively. The two sliding slots 140 are located at the two side surfaces 130, respectively, and extend from the head part 110 to the inserted part 120. Each sliding slot 140 has a bottom surface 141 which is, but not limited to, parallel to the side surface 130. In other embodiments, the slot bottom surface 141 encloses an acute angle with the side surface 130.

The two limiting spaces 150 are located at the bottom surfaces 141 of the two sliding slots 140, respectively. Each limiting space 150 has a first limiting surface 151 and a second limiting surface 152. Both of the first limiting surface 151 and the second limiting surface 152 are connected to the bottom surface 141. The first limiting surface 151 is closer to the head part 110 than the second limiting surface 152.

Moreover, the main body 100 is configured to accommodate a photoelectric conversion circuit (not shown in the figures). Both of the two sliding slots 140 and the two limiting spaces 150 do not penetrate through the inner surface of the main body 100. Therefore, the main body 100 protects the photoelectric conversion circuit from being contaminated by

atmospheric dust..

The head part 110 has at least one optical fiber terminal 160. An optical fiber plug may plug into the photoelectric conversion circuit in the main body 100 through the optical fiber terminal 160.

The sliding component 200 comprises a linkage arm 210 and two extending arms 220. The two extending arms 220 are connected to two ends of the linkage arm 210, respectively. The main body 100 is between the two extending arms 220. The two extending arms 220 are slidably disposed on the two sliding slots 140, respectively. Each extending arm 220 has a second fastening part 230 and a limited part 240. The second fastening part 230 extends along a direction far away from the side surface 130. Each second fastening part 230 has a fastening surface 231 located at one side of the second fastening part 230 facing the head part 110. A distance D1 between one side of the fastening surface 231 which is close to the side surface 130 and the head part 110 is less than a distance D2 from another side of the fastening surface 231 which is far away from the side surface 130 from and the head part 110. That is, the fastening surface 231 is an inclined surface enclosing an acute angle with the side surface 130. The limited part 240 extends toward the side surface 130 and is located in the limiting space 150. The limited part 240 is able to slide between the first limiting surface 151 and the second limiting surface 152 relative to the main body 100. The sliding component is able to slide relative to the main body 100 to have a fastening position and a releasing position. The two first fastening parts 230 are farther from the head part 110 when the two extending arms 220 are located at the fastening position. The two first fastening parts 230 are closer to the head part 110 when the two extending arms 220 are located at the releasing position.

The pull handle 300 is pivoted on the linkage arm 210 of the sliding component 200 and extends outside from the main body 100. The pull handle 300 is able to pivot about the sliding component 200 to be in front of the head part 110 or on the top of the head part 110. In this embodiment, the pull handle 300 is configured to slide the sliding component 200

but the disclosure is not limited thereto. In other embodiments, the pluggable optical transceiver module 10 does not comprise the pull handle 300 and is able to be unplugged from the socket 20 by unplugging the linkage arm 210 directly. Furthermore, in this embodiment, the pull handle 300 is pivoted on the linkage arm 210 but the disclosure is not limited thereto. In other embodiments, the pull handle 300 is welded to the linkage arm 210 or screwed to the linkage arm 210.

Moreover, the pull handle 300 is a band extending outside from the main body 100 in other embodiments. In detail, the band is made of soft rubber materials and rigid materials, which makes the band be highly tough and highly strengthened so that the band is difficult to be ruptured. Meanwhile, because the end of the band is soft rubber, the band has greater deformation so that the band may be temporarily deformed to be in accordance with the operation of the users.

Two elastic components 400 are located at the two limiting spaces 150, respectively. Each elastic component 400 is sandwiched between the first limiting surface 151 disposed on the limiting space 150 and the limited part 240 of the extending arm 220. The elastic component 400 normally presses the limited part 240 so that the second fastening part 230 is located at the fastening position. In this embodiment, both of the number of the limiting spaces 150 and that of the elastic components 400 are, for example, two. In other embodiments, both of the number of the limiting space 150 and that of the elastic component 400 are one.

FIG. 4A is a cross-sectional view of the pluggable optical transceiver module in FIG. 1 when a sliding component is located at a fastening position. FIG. 4B is a partial enlarged view of the pluggable optical transceiver module in FIG. 4A. FIG. 5A is a cross-sectional view of the pluggable optical transceiver module in FIG. 1 when the sliding component is located at a releasing position. FIG. 5B is a partial enlarged view of the pluggable optical transceiver module in FIG. 5A. As seen in FIG. 4A and FIG. 4B, the pluggable optical transceiver module 10 is inserted into the plugging slot 22 of the socket 20. The two first

fastening parts 24 are fastened to the two second fastening parts 230 when the two elastic components 400 respectively press the two limited parts 240 to locate the two second fastening parts 230 at the fastening position. Therefore, the pluggable optical transceiver module 10 is stably inserted into the plugging lot 22 and electrically connected to the socket 20.

As seen in FIG. 5A and FIG. 5B, users is able to pull the pull handle 300 along the direction indicated by an arrow a when removing the pluggable optical transceiver module 10 from the socket 20. The sliding component 200 is slid by the pull handle 300 relative to the main body 200 to be located at the releasing position. Since the fastening surface 231 is an inclined surface, the two first fastening parts 24 pressed by the fastening surface 231 are far away from each other when the sliding component 200 slides along the direction indicated by the arrow a. That is, the two second fastening parts 230 open the two first fastening parts 24 to release the two first fastening parts 24 from the two second fastening parts 230. Therefore, it is more convenient to plug the pluggable optical transceiver module 10 into the socket 20 and unplug the pluggable optical transceiver module 10 from the socket 20.

FIG. 6 is a perspective view of the pluggable optical transceiver module in FIG. 2 when a pull handle pivots on the top of the main body 200. Users are able to apply a force to pull out the pluggable optical transceiver module 10 when the pull handle 300 is located in front of the head part 110. The pull handle 300 is pivoted about the sliding component 200 along the direction indicated by an arrow b to be located above the head part 110 when users insert an optical fiber plug (not shown in the figure) into the optical fiber terminal 160. Since the pull handle 300 does not interfere with the optical fiber plug, it is more convenient for the users to insert the optical fiber plug into the optical fiber terminal 160.

According to the pluggable optical transceiver module of the disclosure, by sliding the sliding component within the two sliding slots, a user is able to easily fasten or release the combination of the two first fastening parts and the two second fastening parts.

Moreover, the pull handle is pivoted about the sliding component so that the pull handle is located in front of the main body or on the top of the main body. Users are able to pull out the pluggable optical transceiver module when the pull handle is located in front of the main body. The pull handle does not interfere with the optical fiber plug when located on the main body. Therefore, it is more convenient for users to insert the optical fiber plug into the optical fiber terminal.

CLAIMS

What is claimed is:

1. A pluggable optical transceiver module, for being inserted into a plugging slot of a socket, the socket comprising two first fastening parts located in the plugging slot, the pluggable optical transceiver module comprising:

a main body having two side surfaces that are opposite to each other and two sliding slots located at the two side surfaces, respectively, wherein the main body is configured to be inserted into the plugging slot; and

a sliding component comprising a linkage arm and two extending arms, wherein the two extending arms are connected to two ends of the linkage arm, respectively, each extending arm has a second fastening part, the main body is between the two extending arms, the two extending arms are slidably disposed on the two sliding slots to have a fastening position and a releasing position, the two first fastening parts are fastened to the two second fastening parts when the two extending arms are located at the fastening position, and the two second fastening parts press the two first fastening parts, respectively, to make the two first fastening parts be farther away from each other when the two extending arms are located at the releasing position.

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

3. The pluggable optical transceiver module according to claim 2, wherein each

second fastening part has a fastening surface, and a distance between one side of the fastening surface which is close to the side surface and the head part is less than a distance between another side of the fastening surface which is far away from the side surface and the head part.

4. The pluggable optical transceiver module according to claim 2, wherein the head part has at least one optical fiber terminal.

5. The pluggable optical transceiver module according to claim 1, wherein the main body has at least one limiting space and two bottom surfaces forming the two sliding slots, respectively, the two bottom surfaces are parallel to the two side surfaces, the at least one limiting space is located at one of the two side surfaces, and each extending arm has a limited part configured to move in the at least one limiting space.

6. The pluggable optical transceiver module according to claim 5, further comprising an elastic component, wherein the main body has a first limiting surface and a second limiting surface forming the limiting space, the first limiting surface is closer to the head part than the second limiting surface, and the elastic component is located in the limiting space and between the first limiting surface and the limited part.

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

8. The pluggable optical transceiver module according to claim 5, wherein the pluggable optical transceiver module further comprises a pull handle pivoted on the linkage arm of the sliding component.

9. A pluggable optical transceiver module, comprising:

a main body having a head part and an inserted part that are connected to each other, wherein the main body further comprises opposite two side surfaces and two sliding slots which are located at two sides of the head part and the inserted part opposite to each other, respectively, the two sliding slots are located at the two side surfaces, and the two sliding slots extend from the head part to the inserted part, respectively; and

a sliding component comprising a linkage arm and two extending arms, wherein the linkage arm is connected between the two extending arms, each extending arm has a second fastening part, the main body is between the two extending arms, the two extending arms are able to slide relative to the two sliding slots to have a fastening position which is farther away from the head part and a releasing position which is closer to the head part.

ABSTRACT

A pluggable optical transceiver module for inserted into plugging slot includes main body and sliding component. The main body has opposite two side surfaces and two sliding slots. The two sliding slots are located at the two side surfaces. The sliding component includes linkage arm and two extending arms. The two extending arms are connected to the linkage arm. Each extending arm has a second fastening part. The main body is between the two extending arms. The two extending arms are disposed on the two sliding slots to have fastening position and releasing position. Two first fastening parts are fastened to the two second fastening parts when the two extending arms are located at fastening position. The two second fastening parts press the two first fastening parts, respectively, for the two first fastening parts being farther from each other when the two extending arms are located at releasing position.

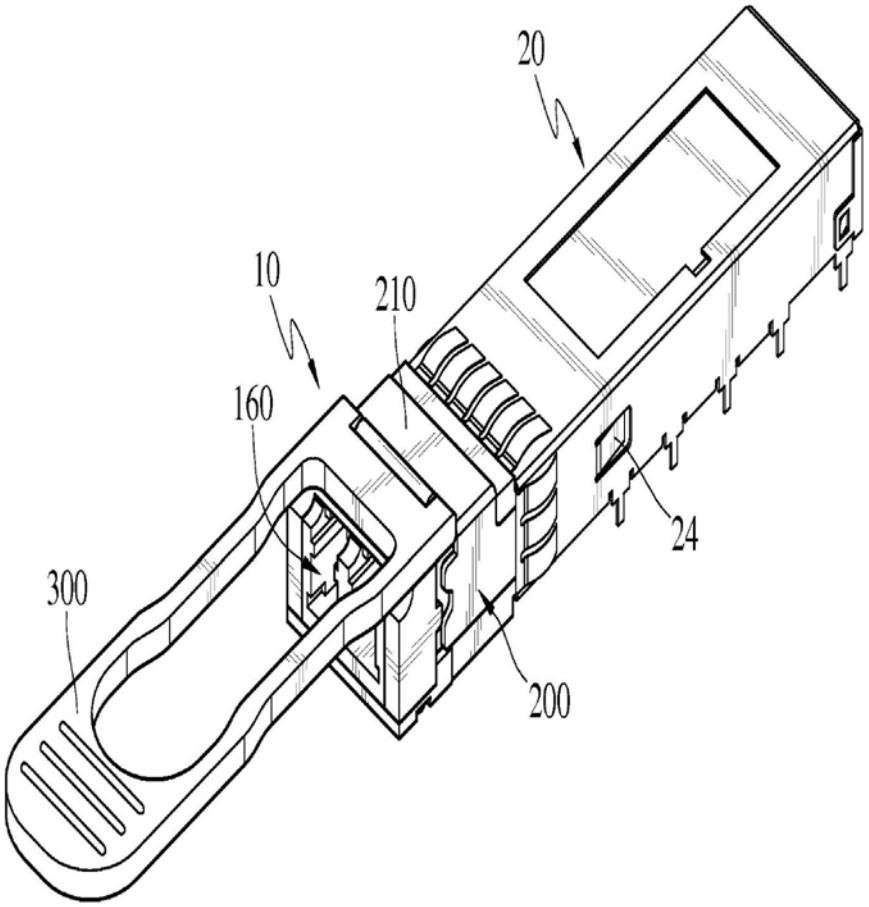


FIG. 1

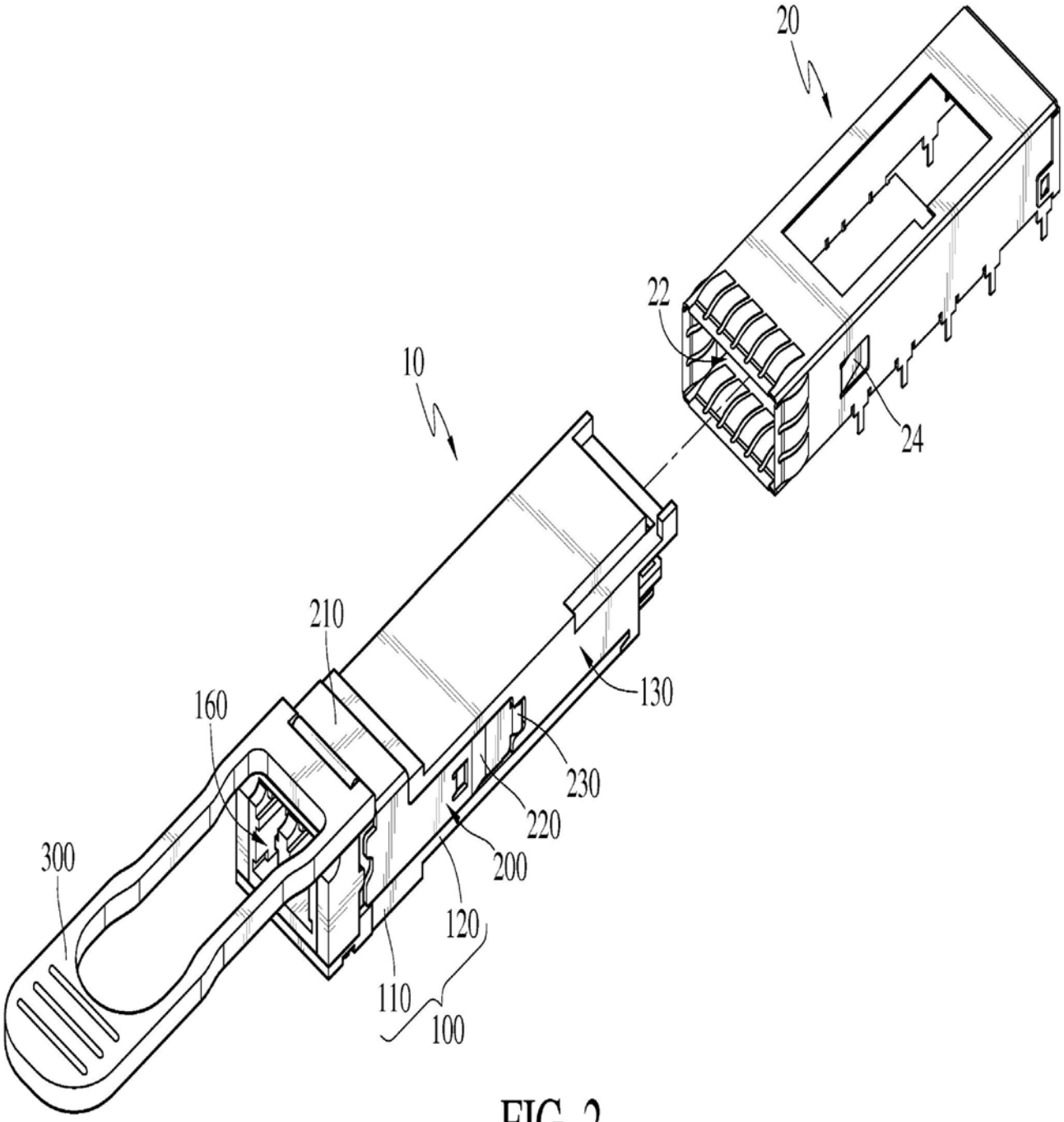


FIG. 2

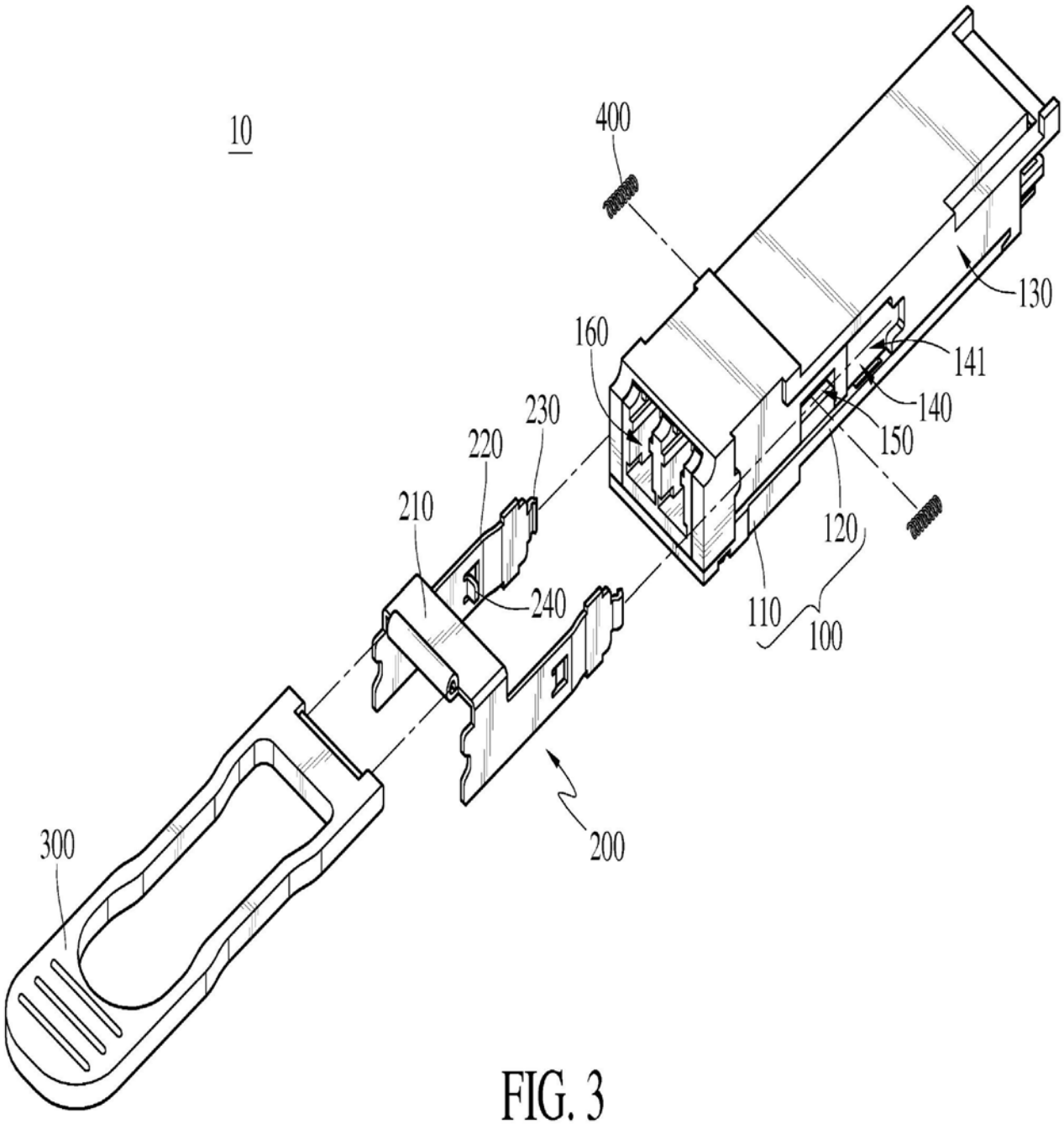


FIG. 3

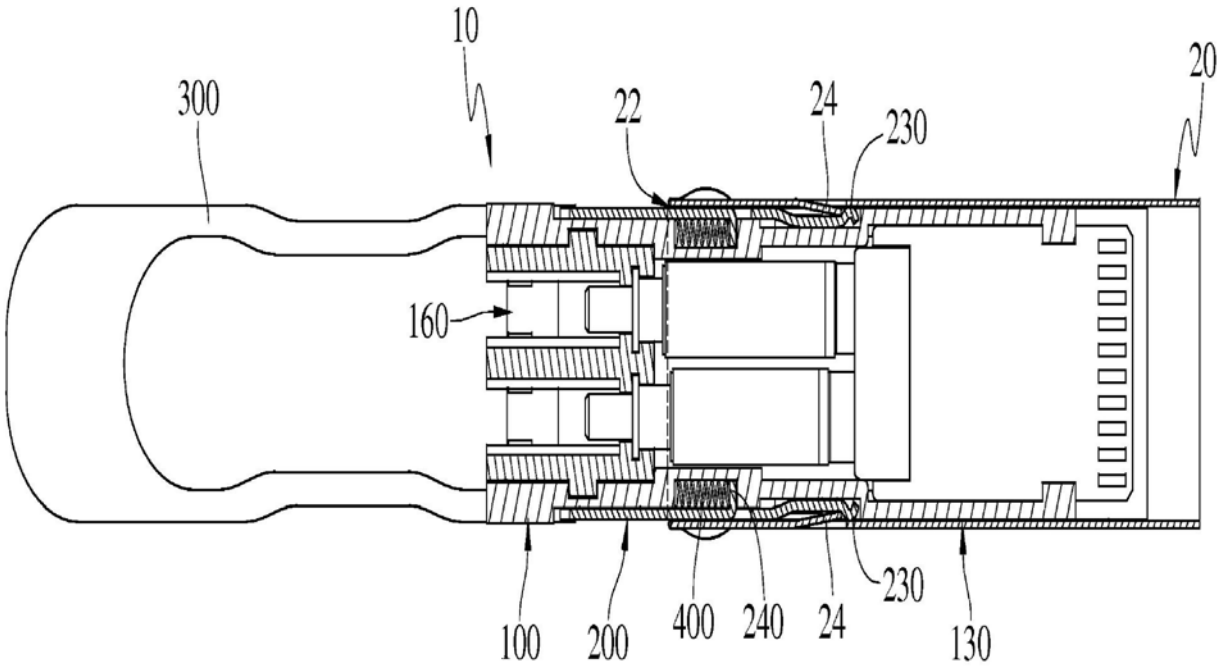


FIG. 4A

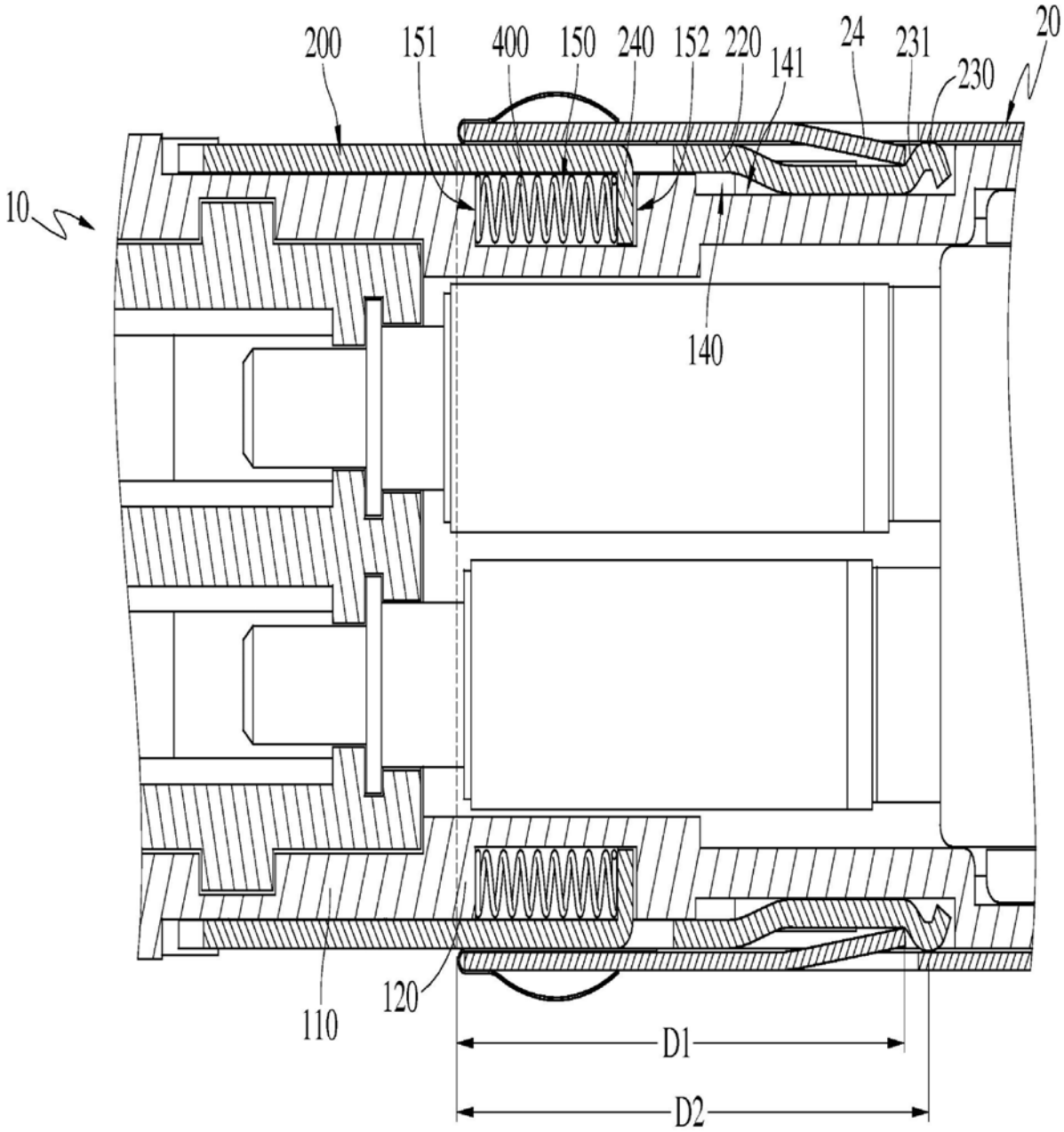


FIG. 4B

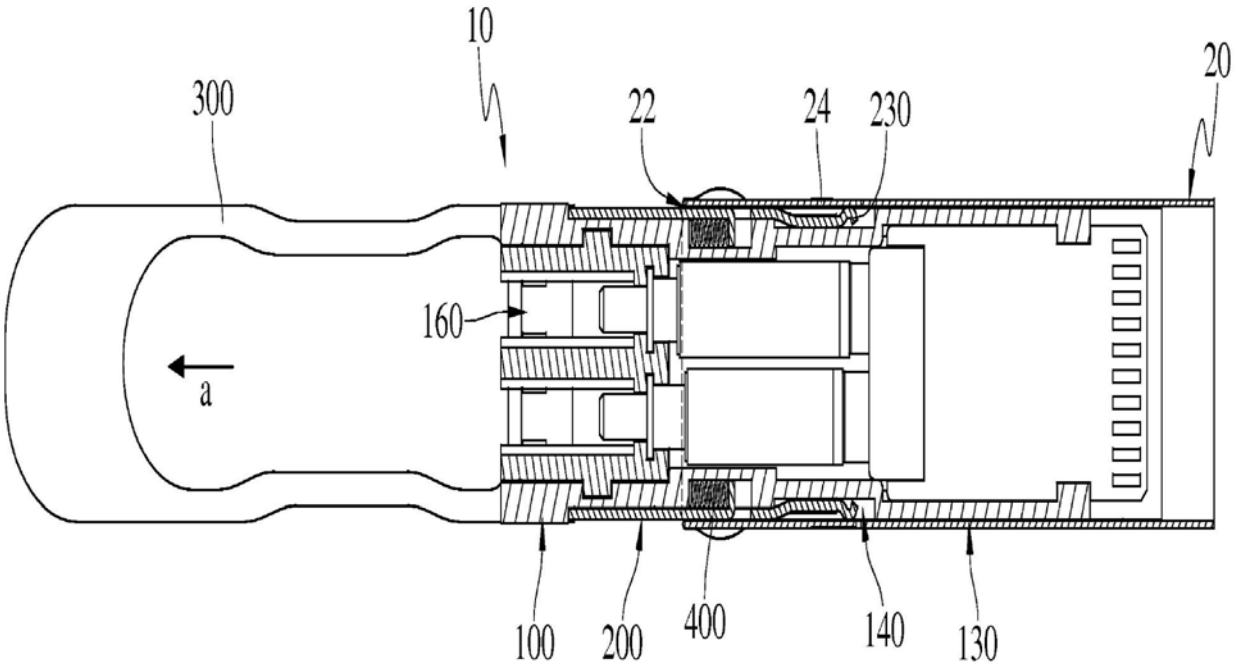


FIG. 5A

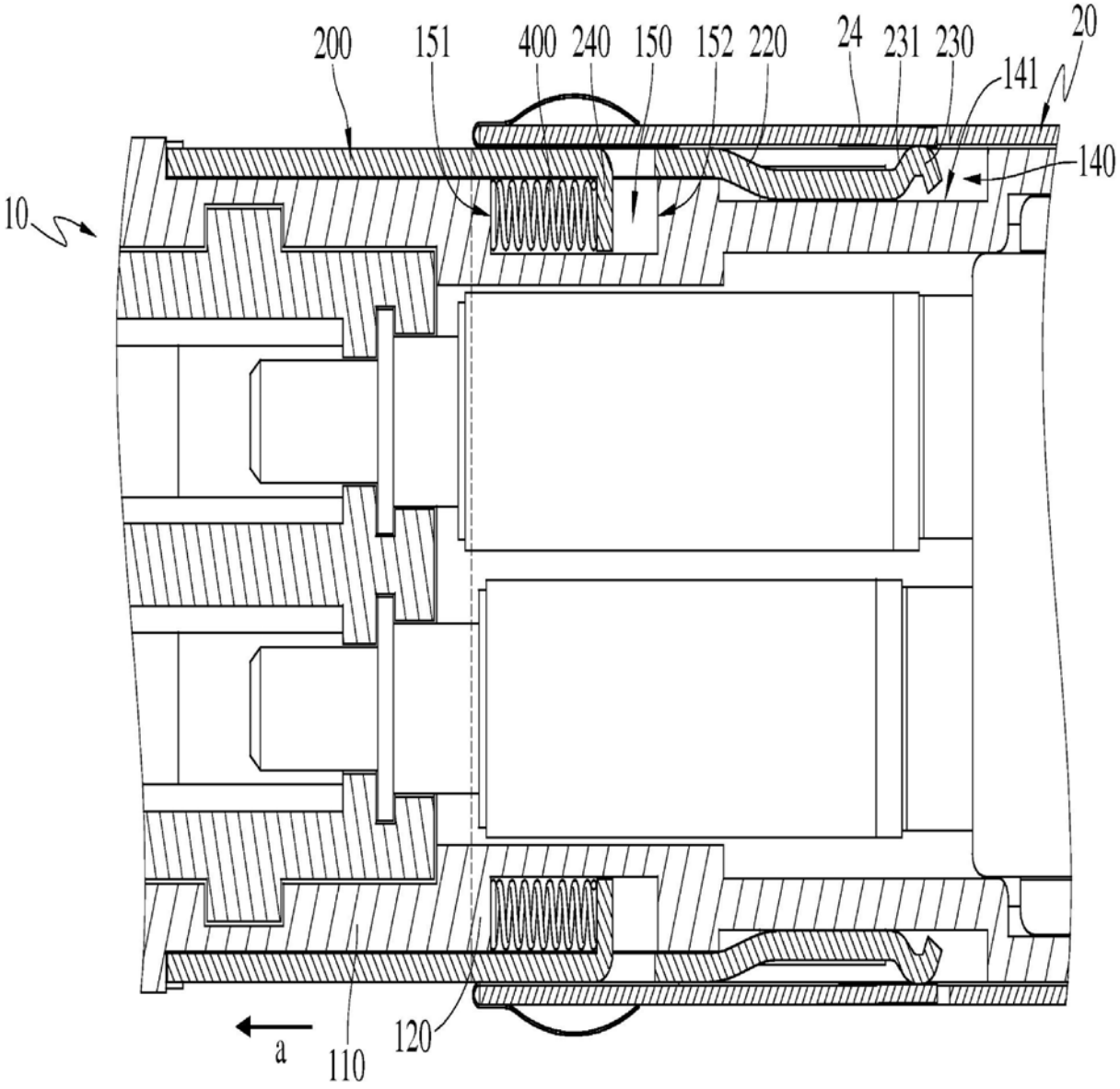


FIG. 5B

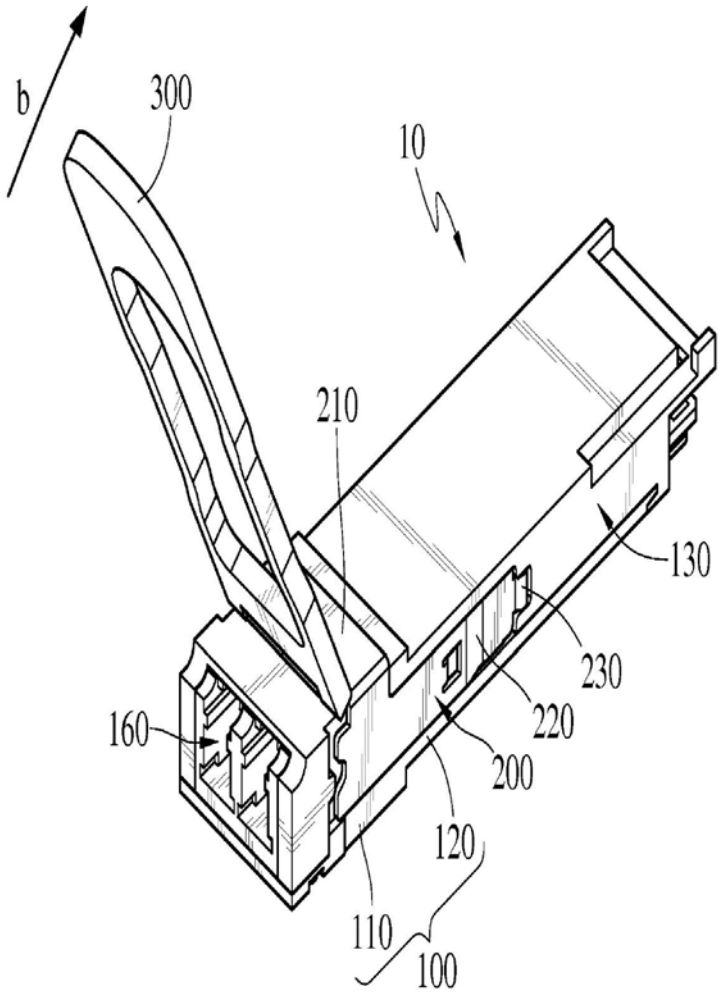


FIG. 6

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	PLUGGABLE OPTICAL TRANSCEIVER MODULE
First Named Inventor/Applicant Name:	Chao-Hung Tsai
Filer:	Kevin J. Carroll/April Davis
Attorney Docket Number:	AOIT003

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

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:	20307753
Application Number:	14504500
International Application Number:	
Confirmation Number:	5134
Title of Invention:	PLUGGABLE OPTICAL TRANSCEIVER MODULE
First Named Inventor/Applicant Name:	Chao-Hung Tsai
Customer Number:	27543
Filer:	Kevin J. Carroll/April Davis
Filer Authorized By:	Kevin J. Carroll
Attorney Docket Number:	AOIT003
Receipt Date:	02-OCT-2014
Filing Date:	
Time Stamp:	10:41:04
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	8296
Deposit Account	501705
Authorized User	

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	AOIT003_ADS_aia0014.pdf	1979273 0c9df9b4037637aa6331855675b57701da1a969e	no	7
Warnings:					
Information:					
2	Power of Attorney	AOIT003_Gen_Power_Attorney.pdf	41270 97017bb963fbc5289e7084dc488a7dbbe431a55f	no	1
Warnings:					
Information:					
3	Oath or Declaration filed	AOIT003_Declaration.pdf	106053 f982f6ecf428fe6c78687a4517d862a2ee151949	no	2
Warnings:					
Information:					
4		AOIT003_Application_asfiled_100214.pdf	55826 7f1aeb71582b42fafc2d3ddf49852e34a23fcaad	yes	12

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	8
Claims	9	11
Abstract	12	12

Warnings:					
Information:					
5	Drawings-only black and white line drawings	AOIT003_Drawings_asfiled_100214.pdf	95640 2bbad3fefe74e2b26b80d74c2b940be591c8a9af	no	8
Warnings:					
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6	Fee Worksheet (SB06)	fee-info.pdf	33070 5a20f7b2b96206764f17297e90e67b653994daf1	no	2
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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.

PTO/AIA/14 (12-13)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	AOIT003
	Application Number	
Title of Invention	PLUGGABLE OPTICAL 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
	Chao-Hung		Tsai	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	New Taipei City	Country of Residence i	TW

Mailing Address of Inventor:

Address 1	6F-1, No. 700, Jhongjheng Rd., Zhonghe Dist.		
Address 2			
City	New Taipei City	State/Province	
Postal Code	235	Country i	TW

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Chien-Te		Lin	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	New Taipei City	Country of Residence i	TW

Mailing Address of Inventor:

Address 1	6F-1, No. 700, Jhongjheng Rd., Zhonghe Dist.		
Address 2			
City	New Taipei City	State/Province	
Postal Code	235	Country i	TW

Inventor 3 Remove

Legal Name

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	AOIT003
	Application Number	
Title of Invention	PLUGGABLE OPTICAL TRANSCEIVER MODULE	

Prefix	Given Name	Middle Name	Family Name	Suffix
	Che-Shou		Yeh	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	New Taipei City	Country of Residence i	TW

Mailing Address of Inventor:

Address 1	6F-1, No. 700, Jhongjheng Rd., Zhonghe Dist.		
Address 2			
City	New Taipei City	**State/Province**	
Postal Code	235	**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	PLUGGABLE OPTICAL TRANSCEIVER MODULE		
Attorney Docket Number	AOIT003	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	8	**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

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	AOIT003
	Application Number	
Title of Invention	PLUGGABLE OPTICAL 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.

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			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)

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) [i] 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)
102135723	TW	2013-10-02	

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	AOIT003
	Application Number	
Title of Invention	PLUGGABLE OPTICAL 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.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	AOIT003
	Application Number	
Title of Invention	PLUGGABLE OPTICAL 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. [X]

Organization Name	Applied Optoelectronics, Inc.

Mailing Address Information:

Address 1	6F-1, No. 700, Jhongjheng Rd., Zhonghe Dist.		
Address 2			
City	New Taipei City	**State/Province**	
Country [i]	TW	Postal Code	235
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 subsitute 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. [ ]

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	AOIT003
	Application Number	
Title of Invention	PLUGGABLE OPTICAL 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. Add

Signature:

Remove

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)	2014-10-02
First Name	Kevin	Last Name	Carroll	Registration Number	36384

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

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.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/504,500

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
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), (i), 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(i))	9 minus 20 =	*			OR	x 80 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 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
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1600

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	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))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)	OR	RATE($)	ADDITIONAL FEE($)
AMENDMENT B	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))									
	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.

UNITED STATES PATENT AND TRADEMARK OFFICE

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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
14/504,500	10/02/2014	2833	1600	AOIT003	9	2

CONFIRMATION NO. 5134

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

FILING RECEIPT

OC000000071221718

Date Mailed: 10/08/2014

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)

Chao-Hung Tsai, New Taipei City, TAIWAN;
Chien-Te Lin, New Taipei City, TAIWAN;
Che-Shou Yeh, New Taipei City, TAIWAN;

Applicant(s)

Applied Optoelectronics, Inc., New Taipei City, TAIWAN

Power of Attorney: The patent practitioners associated with Customer Number 32047

Domestic Applications for which benefit is claimed - None.
A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)
TAIWAN 102135723 10/02/2013

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: 10/07/2014
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/504,500**
Projected Publication Date: 04/02/2015
Non-Publication Request: No
Early Publication Request: No

Title

PLUGGABLE OPTICL TRANSCEIVER MODULE

Preliminary Class

439

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 AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

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申　　請　　日 ： 西元 2013 年 10 月 02 日
Application Date　　Oct. 2, 2013

申　請　案　號 ： 102135723
Application No.

申　　請　　人 ： 祥茂光電科技股份有限公司
Applicant(s)

發　　明　　人 ： 蔡昭宏、林建德、葉哲守
Inventor(s)

局　　長
Director General
王美花

西元 2014 年 05 月 02 日
May. 2, 2014

發明摘要

※ 申請案號：

※ 申請日：　　※IPC 分類：

【發明名稱】 可插拔光收發模組

PLUGGABLE ASSEMBLY FOR OPTICAL TRANSCEIVER

【中文】

一種可插拔光收發模組，用以插設於一插座。插座包含二第一卡扣部。可插拔光收發模組包含一本體及一滑動件。本體具有相對兩側面及二滑槽，二滑槽位於二側面。本體用以插設於插座。滑動件包含一銜接臂及二延伸臂。銜接臂連接於二延伸臂之間。二延伸臂各具有一第二卡扣部。本體介於該二延伸臂之間，且二延伸臂可滑移地設於二滑槽而具有一卡扣位置及一釋放位置。二延伸臂於卡扣位置時，二第一卡扣部勾扣於二第二卡扣部。二延伸臂於釋放位置時，第二卡扣部推抵二第一卡扣部，以令二第一卡扣部相對遠離。藉此提升可插拔光收發模組的插拔便利性。

【英文】

A pluggable assembly for optical transceiver is inserted into a plug socket. The plug socket includes two first locking parts. The pluggable includes a main body for inserting into the plug socket and a sliding element. The main body has two side surfaces and two sliding slots. Two sliding slots locate on two side surfaces. The main body is inserted into the plug socket. The sliding element includes a linkage arm and two extending arms. The linkage arm connects between two extending arms. Two extending has second locking part. The main body locates between two extending arms, and two extending arms dispose on two sliding slots and have locking location and releasing location. When two extending arms

locate on the locking location, two first locking parts lock two second locking parts. When two extending arms locate on the releasing location, two locking parts push two first locking parts far away.

【代表圖】

【本案指定代表圖】：第（ 3 ）圖。

【本代表圖之符號簡單說明】：

10	可插拔光收發模組
100	本體
110	頭部
120	插入部
130	側面
140	滑槽
141	槽底面
150	限位槽
160	光纖插接口
200	滑動件
210	銜接臂
220	延伸臂
230	第二卡扣部
240	限位部
300	拉柄

400 彈性件

【本案若有化學式時，請揭示最能顯示發明特徵的化學式】：

無

發明專利說明書

【發明名稱】 可插拔光收發模組

PLUGGABLE ASSEMBLY FOR OPTICAL TRANSCEIVER

【技術領域】

【0001】 本發明係關於一種光通訊元件，特別是一種可插拔光收發模組。

【先前技術】

【0002】 在現代高速通訊網路中，一般設有光收發模組件，而光收發模組件通常安裝於電子通訊設備中。爲了增加系統設計的彈性及維修方便，光收發模組件以可插拔方式插入設置於通訊設備中對應的插座中。一般而言，此插座係設置於電路板上，爲了界定光收發模組件與對應的插座之間的電氣及機械介面，已提出各種不同的標準，例如用於 10 GB/s 通訊速率的 XFP (10 Gigabit Small Form Factor Pluggable)標準以及 QSFP(Quad Small Form-factor Pluggable)標準等標準。

【0003】 光收發模組件之對應的插座中設有卡鎖機構，以便光收發模組件插入至最終位置時，將其牢固地卡鎖於插座中。因此，光收發模組件須要設有脫離機構，以便自插座中脫離時，能夠容易地解除卡鎖機構的卡鎖而自插座中滑脫。

【0004】 另一方面，於常見的通訊設備中，例如集線器(hub)等網路設備，通常會設有至少一個光收發模組，用以將光訊號轉換爲電訊號。然而，一般架設在電腦機房裡的光收發模組或元件極易累積塵埃等污染物，當光纖纜線尚未與收發模組連接前或者自收發模組移出後，若無適當保護

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處理，光收發模組便會受到粉塵或其他雜質的污染，造成模組元件損壞，損及訊號傳輸功能。

【0005】 有鑑於此，如何提升光收發模組件與插座之間的插拔便利性，以及兼顧光收發模組件的防塵功能，則是此光通訊技術領域者極需改善的問題之一。

【發明內容】

【0006】 本發明在於提供一種可插拔光收發模組，藉以提升光收發模組件與插座之間的插拔便利性，以及兼顧光收發模組件的防塵功能。

【0007】 本發明所揭露的可插拔光收發模組，用以插設於一插座之一插槽。插座包含二第一卡扣部，位於插槽內，可插拔光收發模組包含一本體及一滑動件。本體具有相對兩側面及二滑槽。二滑槽位於二側面。本體用以插設於插槽。滑動件包含一銜接臂及二延伸臂。銜接臂連接於二延伸臂之間。二延伸臂各具有一第二卡扣部。本體介於該二延伸臂之間，且二延伸臂可滑移地設於二滑槽而具有一卡扣位置及一釋放位置。二延伸臂於卡扣位置時，二第一卡扣部勾扣於二第二卡扣部。二延伸臂於釋放位置時，第二卡扣部推抵二第一卡扣部，以令二第一卡扣部相對遠離。

【0008】 本發明所揭露的可插拔光收發模組，包含一本體及一滑動件。本體包含相連的一頭部及一插入部。頭部與插入部分別具有相對兩側面及二滑槽。二滑槽位於二側面，且分別自頭部朝插入部延伸。滑動件包含一銜接臂及二延伸臂。銜接臂連接於二延伸臂之間。二延伸臂各具有一第二卡扣部。本體介於二延伸臂之間，且二延伸臂可滑移地設於二滑槽具有遠離頭部的一卡扣位置及靠近頭部的一釋放位置。

【0009】 根據上述本發明所揭露的可插拔光收發模組，滑動件可滑動地設於本體之滑槽，讓使用者可藉由拉動滑動件而輕易地改變第二卡扣部與第一卡扣部間之組合關係(卡扣與釋放)。

【0010】 以上關於本發明內容的說明及以下實施方式的說明係用以示範與解釋本發明的原理，並且提供本發明的專利申請範圍更進一步的解釋。

【圖式簡單說明】

【0011】

第 1 圖爲根據本發明第一實施例之可插拔光收發模組插設於插座的立體示意圖。

第 2 圖爲第 1 圖之分解示意圖。

第 3 圖爲第 1 圖之分解示意圖。

第 4A 圖爲第 1 圖之滑動件位於卡扣位置之剖面示意圖。

第 4B 圖爲第 4A 圖之部分放大示意圖。

第 5A 圖爲第 1 圖之滑動件位於釋放位置之剖面示意圖。

第 5B 圖爲第 5A 圖之部分放大示意圖。

第6圖爲第2圖之可插拔光收發模組之拉柄樞轉於本體上方的立體示意圖。

【實施方式】

【0012】 請參閱第 1 圖至第 2 圖，第 1 圖爲根據本發明第一實施例之可插拔光收發模組插設於插座的立體示意圖。第 2 圖爲第 1 圖之分解示意圖。

【0013】 本實施例之可插拔光收發模組 10 用以插設於一插座 20，以及將光訊號轉換爲電訊號。插座 20 具有一插槽 22 及二第一卡扣部 24。每一第一卡扣部 24 具彈性變形能力，且第一卡扣部 24 之一端連接於插座 20 之殼體，另一端位於插槽 22 內。在本實施例中，第一卡扣部 24 爲具彈性復位能力的簧片。

【0014】 請參閱第 3 圖至第 4B 圖。第 3 圖爲第 1 圖之分解示意圖。第 4A 圖爲第 1 圖之滑動件位於卡扣位置之剖面示意圖。第 4B 圖爲第 4A 圖之部分放大示意圖。可插拔光收發模組 10 包含一本體 100、一滑動件 200、一拉柄 300 及二彈性件 400。

【0015】 本體 100 包含相連的一頭部 110 及一插入部 120。插入部 120 用以插入於插座 20 之插槽 22。本體 100 具有相對的二側面 130、二滑槽 140 及二限位槽 150。二側面 130 分別位於頭部 110 與插入部 120 之相對兩側。二滑槽 140 分別位於二側面 130，且自頭部 110 朝插入部 120 的方向延伸。二滑槽 140 各具有一槽底面 141，平行於側面 130，但並不以此爲限，在其他實施例中，槽底面 141 也可以與側面 130 夾銳角。

【0016】 二限位槽 150 分別位於二滑槽 140 之槽底面 141，且每一該限位槽 150 具有一第一限位面 151 及一第二限位面 152。第一限位面 151 與第二限位面 152 皆連接於槽底面 141，且第一限位面 151 較第二限位面 152 靠近頭部 110。

【0017】 此外，在本實施例中，本體 100 用以容置光電轉換電路(未繪示)，且二滑槽 140 與二限位槽 150 係未貫穿本體 100 之內壁面，故能夠透過本體 100 來保護光電轉換電路免於環境之塵埃等污染物污染。

【0018】 頭部 110 具有至少一光纖插接口 160，用以供一光纖插頭(未繪示)沿光纖插接口 160 與本體 100 內部之光電轉換電路插接。

【0019】 滑動件 200 包含一銜接臂 210 及二延伸臂 220。銜接臂 210 連接於二延伸臂 220 之間。本體 100 介於二延伸臂 220 之間，且二延伸臂 220 可滑移地設於二滑槽 140。二延伸臂 220 各具有一第二卡扣部 230 及一限位部 240。二第二卡扣部 230 分別朝遠離側面 130 之方向延伸，且二第二卡扣部 230 各具有一卡扣面 231。卡扣面 231 位於第二卡扣部 230 面向頭部 110 之一側，且鄰近側面 130 之一側至頭部 110 的距離 D1 小於卡扣面 231 遠離側面 130 之一側至頭部 110 的距離 D2，也就是說卡扣面 231 爲與側面 130 夾一銳角的一傾斜表面。限位部 240 朝向側面 130 之方向延伸，且位於限位槽 150 內。限位部 240 可相對本體 100 於第一限位面 151 與第二限位面 152 之間滑動。滑動件 200 可相對本體 100 滑動而具有一卡扣位置及一釋放位置。二延伸臂 220 於卡扣位置時，二第一卡扣部 230 較靠近頭部 110。二延伸臂 220 於釋放位置時，二第一卡扣部 230 較遠離頭部 110。

【0020】 拉柄 300 樞設於滑動件 200 之銜接臂 210，並延伸於本體 100 外。拉柄 300 可相對滑動件 200 樞轉而位於頭部 110 之前方或位於頭部 110 之上方。在本實施例中，係利用拉柄 300 來帶動滑動件 200 滑動，但並不以此爲限，在其他實施例中，可插拔光收發模組 10 也可以不要設置拉柄 300，直接抽拉銜接臂 210 來將可插拔光收發模組 10 自插座 20 中拔出。此外，在本實施例中，拉柄 300 係樞設於銜接臂 210，但並不以此爲限，在其他實施例中，拉柄 300 也可以焊接於銜接臂 210 上或用螺絲鎖附於銜接臂 210 上。

【0021】 此外，在其他實施例中，拉柄 300 亦可爲一帶體延伸於本

體 100 外。詳細來說，帶體可爲由軟性橡膠材質及剛性材料所構成，具有高度韌性及強度不易斷裂的特性。並且，因帶體前端爲軟性橡膠材質，具有較大之變形量，故可配合使用者的操作方式。

【0022】 二彈性件 400 分別位於二限位槽 150，且分別介於設於二限位槽 150 之第一限位面 151 與二延伸臂 220 之限位部 240 之間，並常態推抵二限位部 240 而令二第二卡扣部 230 位於卡扣位置。在本實施例中，限位槽 150 的數量與二彈性件 400 的數量爲二個，但並不以此爲限，在其他實施例中，限位槽 150 的數量與彈性件 400 的數量也可以爲一個。

【0023】 請參閱第 4A 圖至第 5B 圖，第 5A 圖爲第 1 圖之滑動件位於釋放位置之剖面示意圖。第 5B 圖爲第 5A 圖之部分放大示意圖。

【0024】 如第 4A 圖與第 4B 圖所示，可插拔光收發模組 10 插設於插座 20 之插槽 22 內，且二限位部 240 分別受彈性件 400 推抵而令二第二卡扣部 230 位於卡扣位置時，二第二第一卡扣部 24 勾扣於二第二卡扣部 230 之卡扣面 231，使可插拔光收發模組 10 穩固地插設於插座 20 之插槽 22，並確保可插拔光收發模組 10 電性連接於插座 20。

【0025】 如第 5A 圖與第 5B 圖所示，當使用者欲將可插拔光收發模組 10 脫離插座 20 時，使用者可沿箭頭 a 所指示之方向拉動拉柄 300，以令拉柄 300 帶動滑動件 200 相對本體 100 滑動而位於釋放位置。於滑動件 200 滑移的過程(自卡扣位置滑移至釋放位置的過程)中，由於卡扣面 231 爲斜面，故當滑動件 200 沿箭頭 a 所指示之方向滑動時，二第一卡扣部 24 會受到二卡扣面 231 之推抵而相對遠離。也就是說，二第一卡扣部 24 會被二第二卡扣部 230 撐開以解除第一卡扣部 24 與第二卡扣部 230 之間的卡扣效

果，進而提升可插拔光收發模組 10 與插座 20 之間的插拔便利性。

【0026】 請參閱第 2 圖與第 6 圖，第 6 圖爲第 2 圖之可插拔光收發模組之拉柄樞轉的立體示意圖。如第 2 圖所示，拉柄 300 位於頭部 110 之前方時，可便於使用者施力來抽離可插拔光收發模組 10。但當需要將光纖插頭插入光纖插接口 160 時，使用者可沿箭頭 b 所指示之方向樞轉拉柄 300，使拉柄相對滑動件 200 樞轉而位於頭部 110 之上方。由於拉柄 300 位於頭部 110 之上方時，光纖插頭要插入光纖插接口 160 時不會受到拉柄 300 之阻擋，故便於使用者將光纖插頭(未繪示)插入光纖插接口 160。

【0027】 根據上述本發明所揭露的可插拔光收發模組，滑動件可滑動地設於本體之滑槽，讓使用者可藉由拉動滑動件而輕易地改變第二卡扣部與第一卡扣部間之組合關係(卡扣與釋放)。

【0028】 此外，由於拉柄係可樞轉地設於滑動件上，故拉柄可選擇性地位於本體之前方或上方，當拉柄樞轉於本體之前方時，可便於使用者施力來抽離可插拔光收發模組。當拉柄樞轉於本體之上方時，拉柄不再阻擋於本體前方，故光纖插頭要插入光纖插接口時並不會受到拉柄之阻擋而便於使用者將光纖插頭插入光纖插接口。

【0029】 雖然本發明的實施例揭露如上所述，然並非用以限定本發明，任何熟習相關技藝者，在不脫離本發明的精神和範圍內，舉凡依本發明申請範圍所述的形狀、構造、特徵及數量當可做些許的變更，因此本發明的專利保護範圍須視本說明書所附的申請專利範圍所界定者爲準。

【符號說明】

【0030】

10	可插拔光收發模組
20	插座
22	插槽
24	第一卡扣部
100	本體
110	頭部
120	插入部
130	側面
140	滑槽
141	槽底面
150	限位槽
151	第一限位面
152	第二限位面
160	光纖插接口
200	滑動件
210	銜接臂
220	延伸臂
230	第二卡扣部
240	限位部
300	拉柄
400	彈性件

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申請專利範圍

1. 一種可插拔光收發模組，用以插設於一插座之一插槽，該插座包含二第一卡扣部，位於該插槽內，該可插拔光收發模組包含：

一本體，具有相對兩側面及二滑槽，該二滑槽位於該二側面，該本體用以插設於該插槽；以及

一滑動件，包含一銜接臂及二延伸臂，該銜接臂連接於該二延伸臂之間，該二延伸臂各具有一第二卡扣部，該本體介於該二延伸臂之間，且該二延伸臂可滑移地設於該二滑槽而具有一卡扣位置及一釋放位置，該二延伸臂於該卡扣位置時，該二第一卡扣部勾扣於該二第二卡扣部，該二延伸臂於該釋放位置時，該第二卡扣部推抵該二第一卡扣部，以令該二第一卡扣部相對遠離。

2. 如請求項 1 所述之可插拔光收發模組，其中該本體包含相連的一頭部及一插入部，該插入部用以插設於該插座，該二側面分別位於該頭部與該插入部之相對兩側，該二滑槽分別自該頭部朝該插入部延伸，該二延伸臂可相對該二滑槽滑動而具有遠離該頭部的該卡扣位置及靠近該頭部的該釋放位置。

3. 如請求項 2 所述之可插拔光收發模組，其中該二第二卡扣部各具有一卡扣面，該卡扣面鄰近該側面之一側至該頭部的距離小於該卡扣面遠離該側面之一側至該頭部的距離。

4. 如請求項 2 所述之可插拔光收發模組，其中該頭部具有至少一光纖插接口。

5. 如請求項 1 所述之可插拔光收發模組，其中該本體具有至少一限位槽及

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形成該二滑槽之二槽底面，該二槽底面平行於該二側面，該至少一限位槽位於該二槽底面之一，該二延伸臂各具有一限位部，可位移地位於該限位槽。

6. 如請求項 5 所述之可插拔光收發模組，更包含一彈性件，該本體具有形成該限位槽之一第一限位面及一第二限位面，該第一限位面較該第二限位面靠近該頭部，該彈性件位於該限位槽，且介於該第一限位面與該限位部之間。

7. 如請求項 5 所述之可插拔光收發模組，更包含二彈性件，該至少一限位槽的數量爲二，該本體具有形成該二限位槽之二第一限位面及二第二限位面，該二第一限位面較該二第二限位面靠近該頭部，該二彈性件分別位於該二限位槽，且分別介於設於該二限位槽之該第一限位面與該限位部之間。

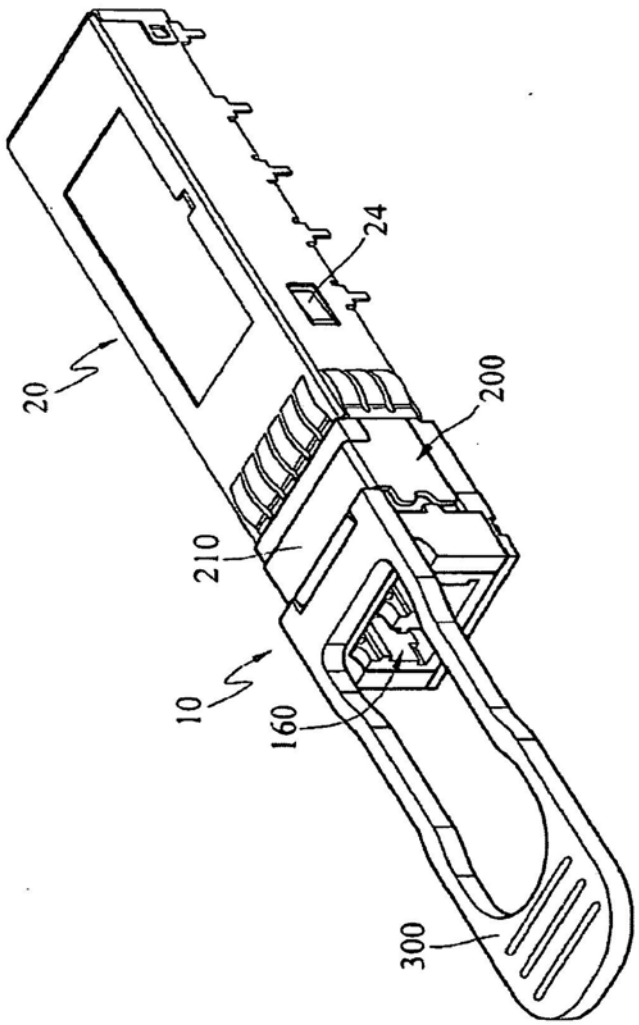
8. 如請求項 1 所述之可插拔光收發模組，更包含一拉柄，樞設於該滑動件之該銜接臂。

9. 一種可插拔光收發模組，包含：

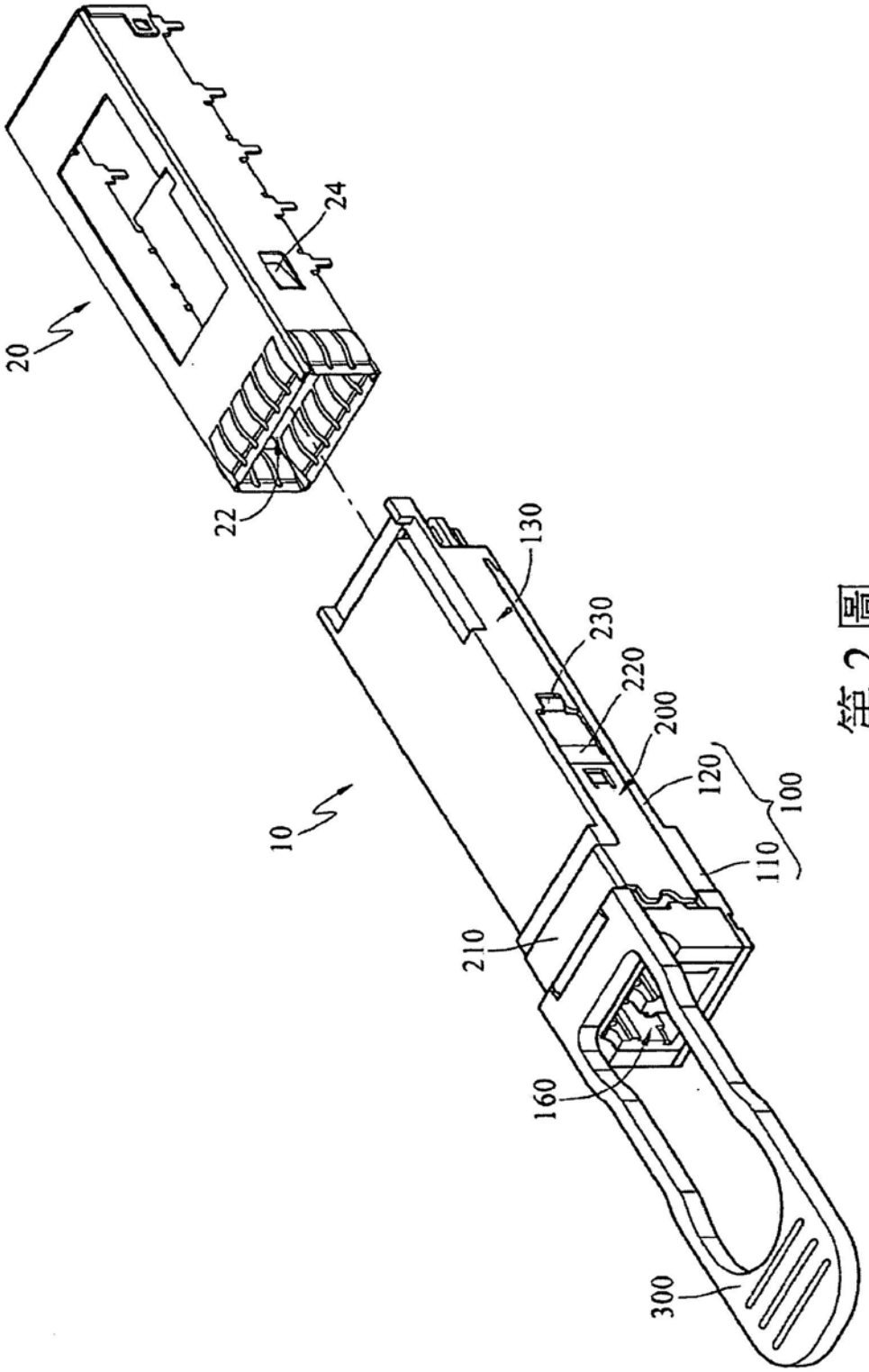
一本體，包含相連的一頭部及一插入部，該頭部與該插入部分別具有相對兩側面及二滑槽，該二滑槽位於該二側面，且分別自該頭部朝該插入部延伸；以及

一滑動件，包含一銜接臂及二延伸臂，該銜接臂連接於該二延伸臂之間，該二延伸臂各具有一第二卡扣部，該本體介於該二延伸臂之間，且該二延伸臂可滑移地設於該二滑槽具有遠離該頭部的一卡扣位置及靠近該頭部的一釋放位置。

圖式

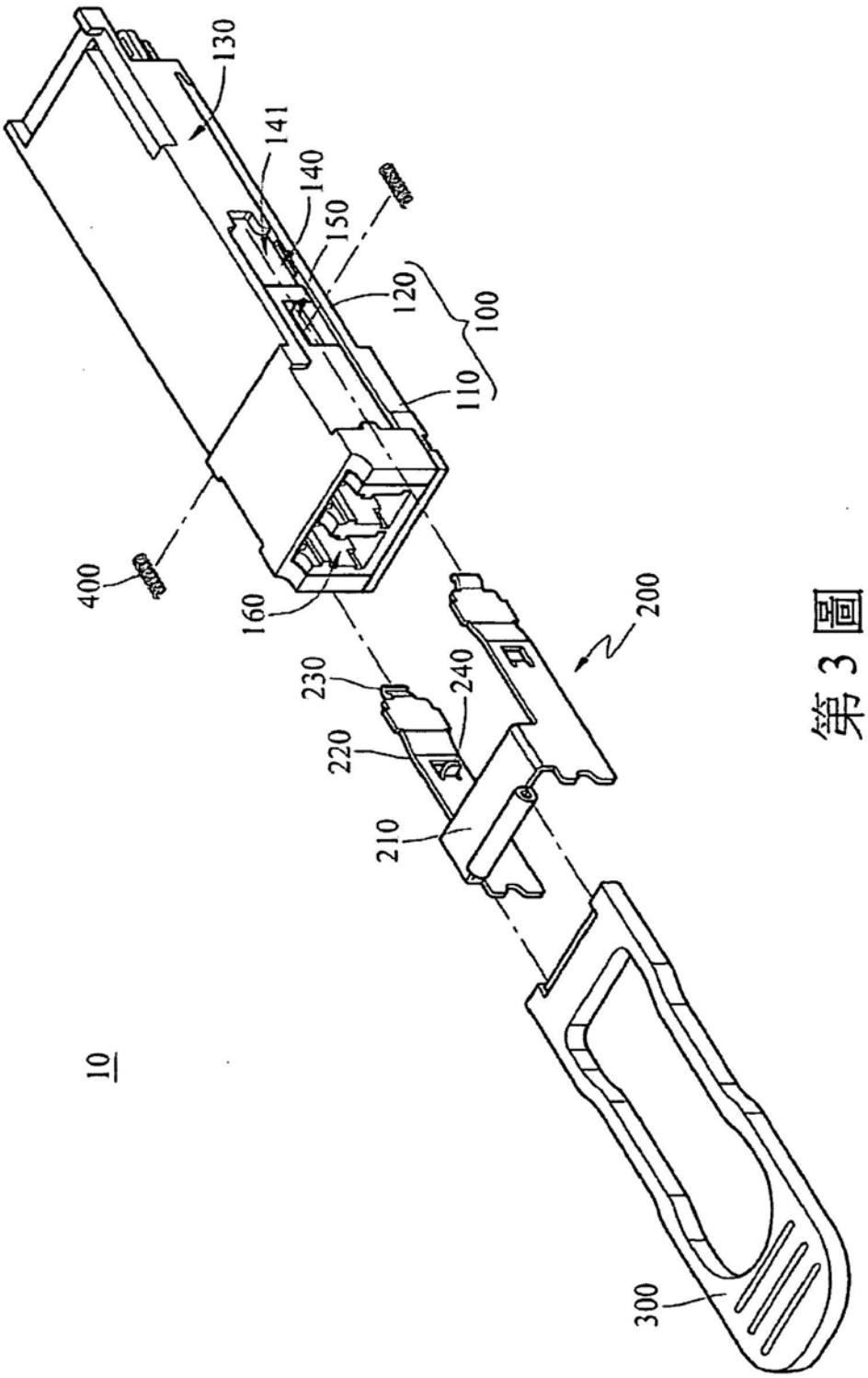


第 1 圖



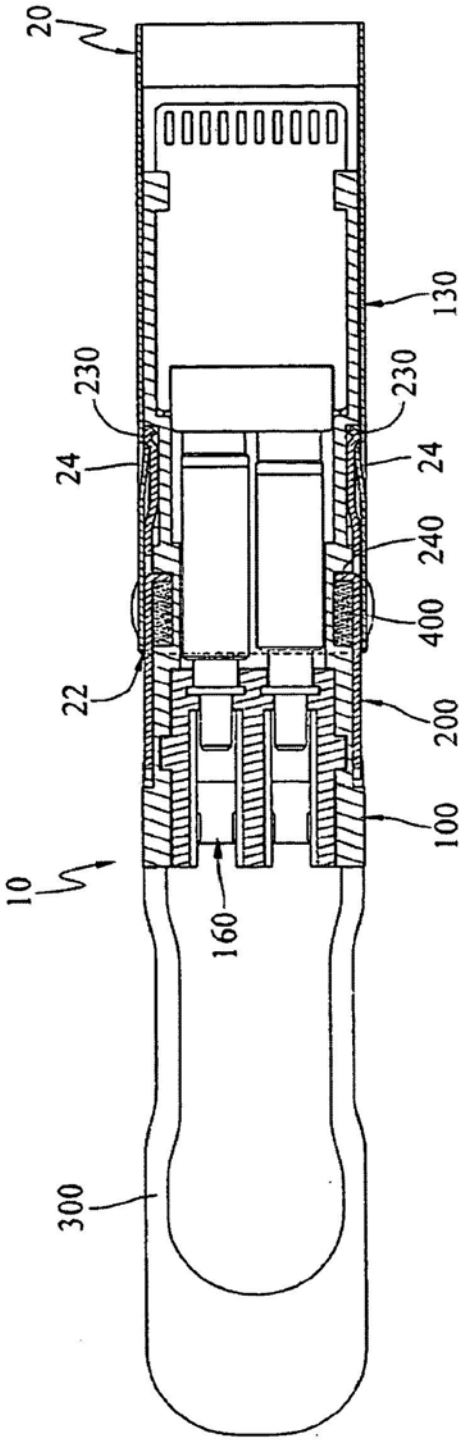
第 2 圖

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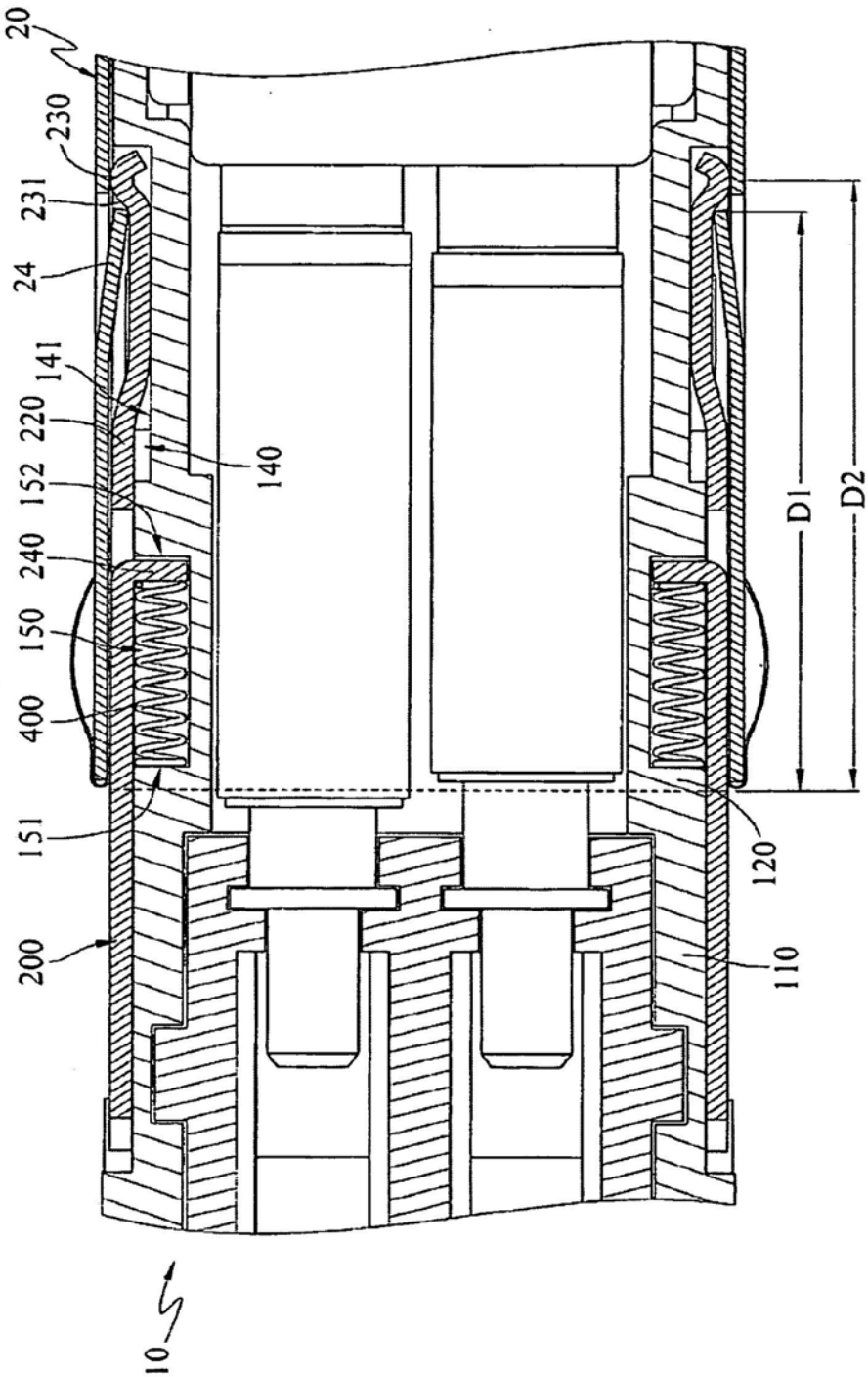
第 3 圖

申請案號：102135723



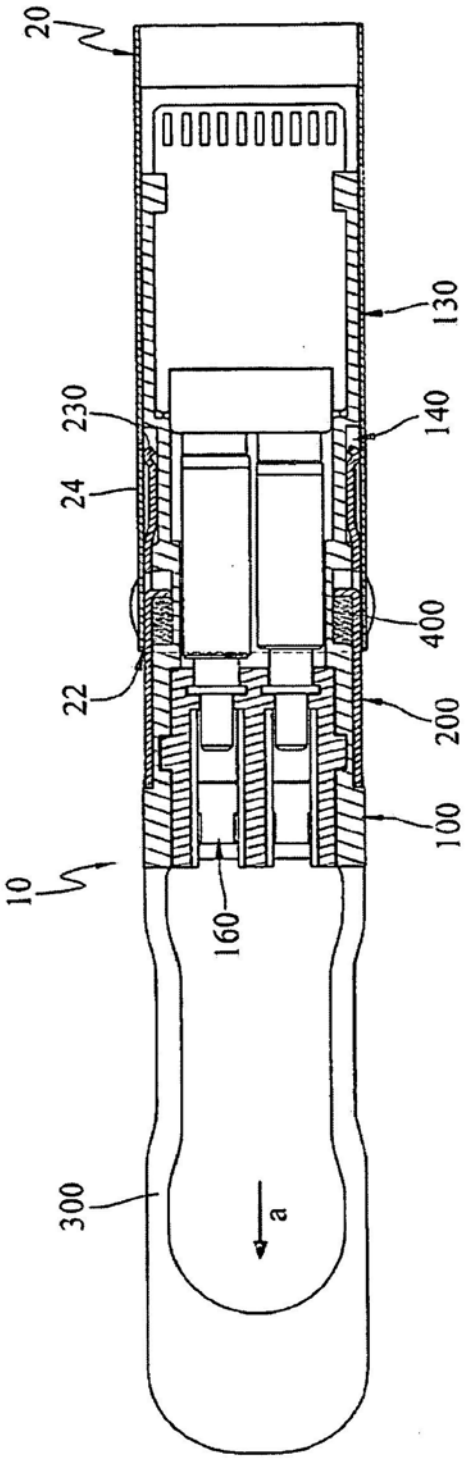
第4A圖

申請案號：102135723



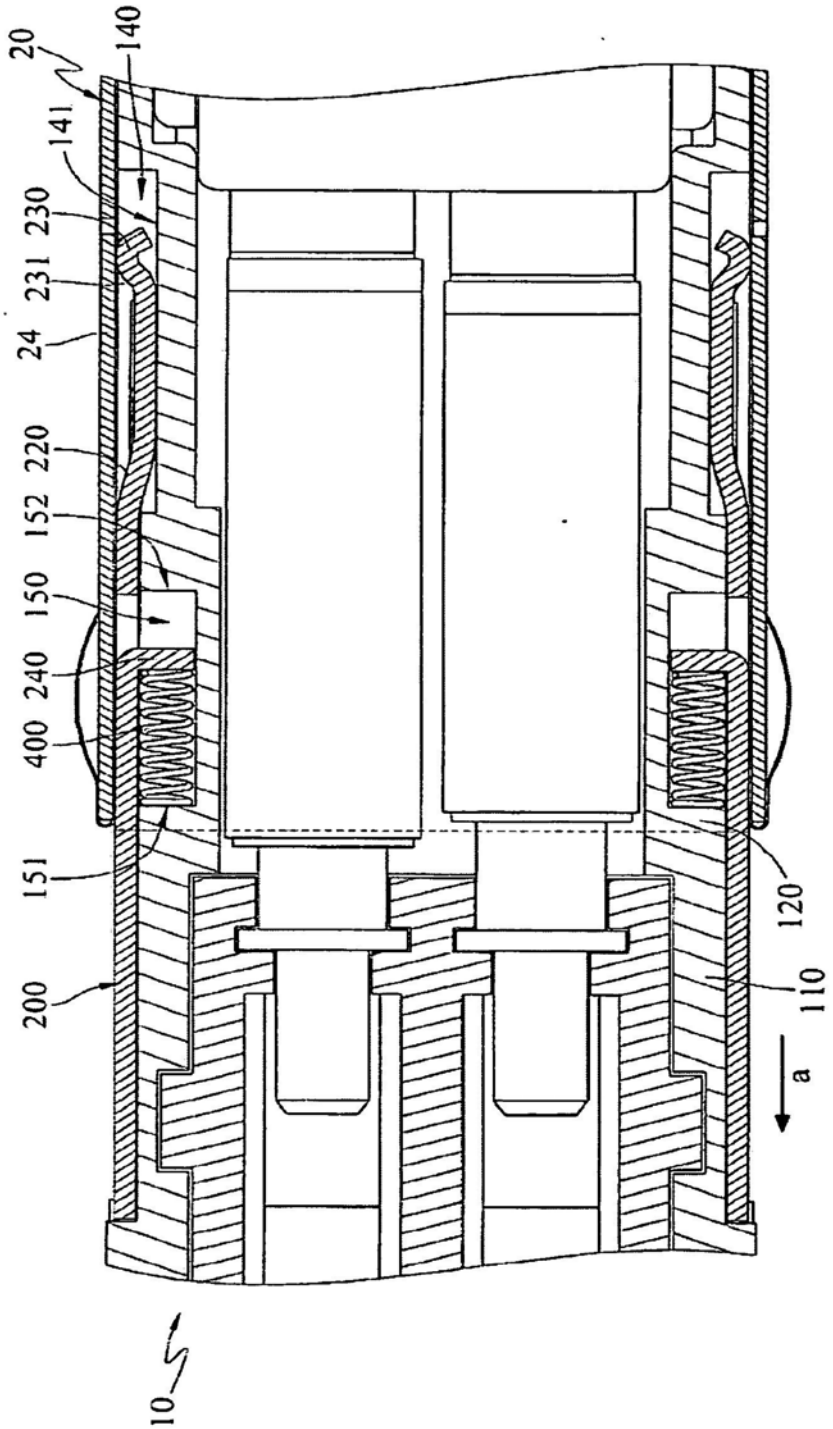
第4B圖

申請案號：102135723



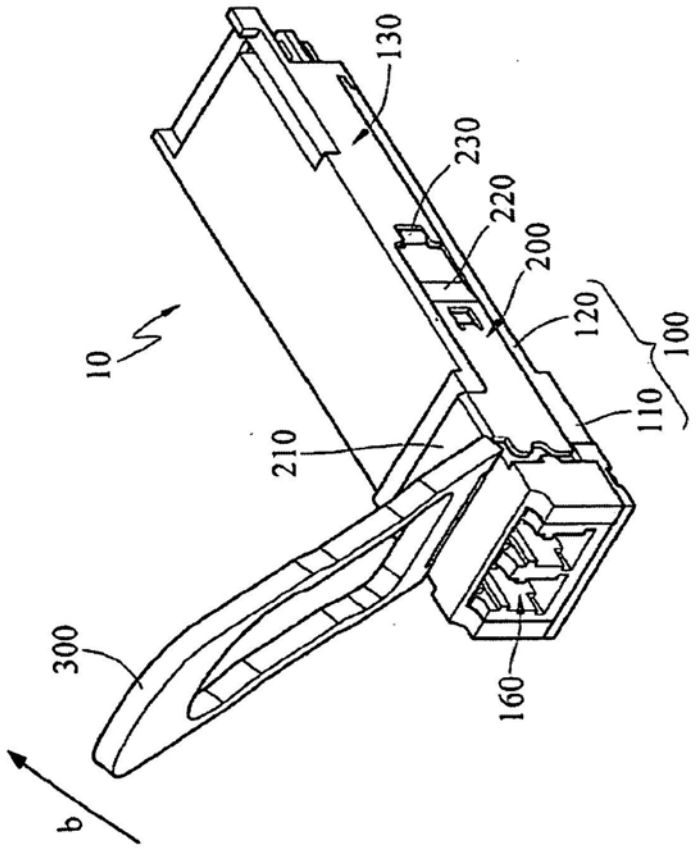
第5A圖

申請案號：102135723



第5B圖

申請案號：102135723



第6圖

申請案號：102135723

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Document Description: Transmittal Letter

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(to be used for all correspondence after initial filing)

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Filing Date	October 2, 2014
First Named Inventor	TSAI
Art Unit	
Examiner Name	
Attorney Docket Number	AOIT003

Total Number of Pages in This Submission

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
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  - ☐ Affidavits/declaration(s)
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- ☑ Certified Copy of Priority Document(s)
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- ☐ Petition to Convert to a Provisional Application
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- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please Identify below):

Remarks

Enclosed: Priority Document TW102135723

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Grossman Tucker Perreault & Pfleger, PLLC		
Signature			
Printed name	Kevin J. Carroll		
Date	October 2, 2014	Reg. No.	36,384

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CONFIRMATION NO. 5134

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

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