UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/857,300	**06/06/2024 12:06:46 PM Z ET**	**USCO-053-05**

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5557	FILED BY	Michael Leetzow
PATENT CENTER #	65854180	AUTHORIZED BY	-
CUSTOMER #	152017	FILING DATE	07/05/2022
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Hiep V. Nguyen

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 2754	**E202466C07157353**	**Michael Leetzow**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1806	SUBMISSION OF AN INFORMATION DISCLOSURE STATEMENT	260.00	1	260.00
			TOTAL AMOUNT:	**$260.00**

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 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/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

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

Application Number	17857300
Filing Date	2022-07-05
First Named Inventor	Hiep V. Nguyen
Art Unit	2874
Examiner Name	Omar R ROJAS
Attorney Docket Number	USCO-053-05

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5222168	A	1993-06-22	Saito et al.	
	2	5673346	A	1997-09-30	Iwano et al.	
	3	6146023	A	2000-11-14	Weigel	
	4	6220762	B1	2001-04-24	Kanai et al.	
	5	6305961	B1	2001-10-23	Szilagyi et al.	
	6	6371659	B1	2002-04-16	Weigel	
	7	6386768	B1	2002-05-14	Yoon et al.	
	8	6929406	B2	2005-08-16	Amorim	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17857300
	Filing Date	2022-07-05
	First Named Inventor	Hiep V. Nguyen
	Art Unit	2874
	Examiner Name	Omar R ROJAS
	Attorney Docket Number	USCO-053-05

	9	9075203	B2	2015-07-07	Holmberg	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20040247252	A1	2004-12-09	Ehrenreich, John et al.	
	2	20050111796	A1	2005-05-26	Matasek, Jeffrey A. et al.	
	3	20050135753	A1	2005-06-23	Eigenmann, Daniel et al.	
	4	20050281509	A1	2005-12-22	Cox, Larry R. et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2012174227	WO	A2	2012-12-20	Hodge et al.		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	17857300
	Filing Date	2022-07-05
	First Named Inventor	Hiep V. Nguyen
	Art Unit	2874
	Examiner Name	Omar R ROJAS
	Attorney Docket Number	USCO-053-05

	1	Japanese Utility Model Reg. No. 2573482; Japanese and English versions; March 20, 1998; 15 total pages	☒
	2	Petition for Inter Partes Review of USPN 11,385,415; 207 Pages; April 24, 2024.	☐

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

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	17857300
	Filing Date	2022-07-05
	First Named Inventor	Hiep V. Nguyen
	Art Unit	2874
	Examiner Name	Omar R ROJAS
	Attorney Docket Number	USCO-053-05

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Michael L. Leetzow/	Date (YYYY-MM-DD)	2024-06-06
Name/Print	Michael L. Leetzow	Registration Number	35932

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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.**

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 record s.

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.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/857,300	**06/06/2024 12:06:46 PM Z ET**	**USCO-053-05**

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5557	FILED BY	Michael Leetzow
PATENT CENTER #	65854180	FILING DATE	07/05/2022
CUSTOMER #	152017	FIRST NAMED INVENTOR	Hiep V. Nguyen
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	-

Documents

TOTAL DOCUMENTS: 4

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
WO2012174227A2_Original_document_20240606175759.pdf	20	Foreign Reference	1313 KB
JapaneseRef.pdf	15	Foreign Reference	3372 KB
IPRPetitionFont.pdf	207	Non Patent Literature	9931 KB
20240605_USCO05305.pdf	5	Information Disclosure Statement (IDS) Form (SB08)	1253 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
WO2012174227A2_Original_document_20240606175759.pdf	AEE0089B775E676085EFBA5F95F7A519C0E4190D5782D7546C036CB9B198DD74EF1F4FE723E7808353E5528FBFD6E65464EEABC31132C0283F311E2890215E48
JapaneseRef.pdf	CC89E100C93D48B3F5E6FF3BF70298E9B04475DFAA1CB84B0B98932031A2887CBF199BADAA4555A461A218BA7F52B648023BC83070989E513C60D84D86EED510
IPRPetitionFont.pdf	D4701E972C1DCDBB2F8B561D6F0C2B72E707A2E232BBAE2C0C65ECBAB020843DA6A0E864A484699F02115B7F1819FE589E6398F24A9785C3C8AF3E4BB42DBFAD
20240605_USCO05305.pdf	E3BF5068309C563DC627CE526A40553861EAA9B84649C6CA4C14F0FC581FD9F01EAB112A2AA396D0A939AB6E7B10B98FD91DFDAFB67DF880E66C8A3F121F8BA3

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 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.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
20 December 2012 (20.12.2012)

WIPO | PCT

(10) International Publication Number
WO 2012/174227 A2

(51) International Patent Classification: Not classified

(21) International Application Number:
PCT/US2012/042436

(22) International Filing Date:
14 June 2012 (14.06.2012)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/496,715 14 June 2011 (14.06.2011) US

(71) Applicant *(for all designated States except US)*: **MOLEX INCORPORATED** [US/US]; 2222 Wellington Court, Lisle, Illinois 60532 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **HODGE, Malcolm H.** [US/US]; c/o Molex Incorporated, 2222 Wellington Court, Lisle, Illinois 60532 (US). **CHEN, WenZong** [US/US]; c/o Molex Incorporated, 2222 Wellington Court, Lisle, Illinois 60532 (US). **RICHARDSON, Dean** [US/US]; c/o Molex Incorporated, 2222 Wellington Court, Lisle, Illinois 60532 (US). **ERNST, Scot A.** [US/US]; c/o Molex Incorporated, 2222 Wellington Court, Lisle, Illinois 60532 (US). **SCHILTZ, Thomas D.** [US/US]; c/o Molex Incorporated, 2222 Wellington Court, Lisle, Illinois 60532 (US). **MARRAPODE, Thomas R.** [US/US]; c/o Molex Incorporated, 2222 Wellington Court, Lisle, Illinois 60532 (US).

(74) Agent: **MORELLA, Timothy M.**; Molex Incorporated, 2222 Wellington Court, Lisle, Illinois 60532 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

(54) **Title**: FERRULE ASSEMBLY WITH INTEGRAL LATCH

(57) **Abstract**: An optical fiber assembly includes a ferrule body with a plurality of optical fibers positioned therein. The assembly may include a beam expanding element adjacent the front face of the ferrule body with a lens array aligned with the optical fibers. A resilient latch is integrally formed with the beam expanding element or the ferrule body.

WO 2012/174227 A2

FERRULE ASSEMBLY WITH INTEGRAL LATCH

REFERENCE TO RELATED APPLICATIONS

[0001] The Present Disclosure claims priority to prior-filed United States Provisional Patent Application No. 61/496,715, entitled "Paroli-Type Ferrule Assembly," filed on 14 June 2011 with the United States Patent And Trademark Office. The content of the aforementioned Patent Application is incorporated in its entirety herein.

BACKGROUND OF THE PRESENT DISCLOSURE

[0002] The Present Disclosure relates generally to optical fiber ferrule assemblies and, more particularly, to a multi-fiber ferrule assembly with an integrally formed latch to secure the ferrule assembly to a mating component.

[0003] Systems for interconnecting optical fibers typically utilize mating ferrule assemblies to facilitate handling and accurate positioning of the fibers. The optical fibers are secured within a ferrule body with an end surface of each fiber being positioned generally flush with or slightly protruding from an end face of the ferrule body. The end surfaces or faces of the fibers are often polished to desired finish. When complementary ferrules assemblies are mated, each optical fiber of one ferrule assembly is aligned with a mating optical fiber of the other ferrule assembly.

[0004] In some applications, the end faces of the mating optical fibers physically contact one another in order to effect signal transmission between the mating optical fiber pair. In other applications, the end faces are spaced apart and the optical beams of each fiber are expanded and transmitted over an air gap between the optical fibers. In either case, it is desirable to securely fix each ferrule assembly to its mating component.

[0005] Latching assemblies are often used to removably secure the ferrule assembly to its mating component. These latching assemblies are often formed on a housing or another structure in which the ferrule assembly is fixed. Such additional structure increases the cost and complexity of the system. It is desirable to provide a multi-fiber ferrule assembly having an integral latch to reduce the complexity and cost of the optical fiber components.

SUMMARY OF THE PRESENT DISCLOSURE

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 11

[0006] In one aspect, an optical fiber assembly includes a plurality of generally parallel optical fibers. A ferrule body has the plurality of optical fibers positioned therein and a front face with the end face of each optical fiber being positioned generally adjacent the front face. A beam expanding element is generally adjacent the front face of the ferrule body and has a lens array aligned with the optical fibers. A resilient latch for interconnecting the optical fiber assembly to a mating component is integrally formed with the beam expanding element.

[0007] In another aspect, an optical fiber assembly includes a plurality of generally parallel optical fibers. A ferrule body directly engages optical fibers that are positioned therein. An end face of each optical fiber is positioned generally adjacent the front face of the ferrule body. A beam expanding element is generally adjacent the front face of the ferrule body and has a lens array aligned with the optical fibers. A resilient latch for interconnecting the optical fiber assembly to a mating component is integrally formed with the ferrule body or the beam expanding element.

[0008] In still another aspect, an optical fiber assembly includes a ferrule body directly engaging a plurality of optical fibers positioned therein. The ferrule body has a front face and the end face of each optical fiber is positioned generally adjacent the front face. A resilient latch for interconnecting the optical fiber assembly to a mating component is integrally formed with the ferrule body.

BRIEF DESCRIPTION OF THE FIGURES

[0009] The organization and manner of the structure and operation of the Present Disclosure, together with further objects and advantages thereof, may best be understood by reference to the following Detailed Description, taken in connection with the accompanying Figures, wherein like reference numerals identify like elements, and in which:

[0010] Figure 1 is a perspective view of an embodiment of a terminated ferrule assembly;

[0011] Figure 2 is an exploded perspective view of the ferrule assembly of Fig. 1;

[0012] Figure 3 is a perspective view of a ferrule assembly inserted into an adapter and a second ferrule assembly aligned for insertion therein;

[0013] Figure 4 is a section taken generally along Line 4-4 of Fig. 3;

[0014] Figure 5 is a perspective view of an alternate embodiment of a terminated ferrule assembly; and

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 12

[0015] Figure 6 is an exploded perspective view of the ferrule assembly of Fig. 5.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] While the Present Disclosure may be susceptible to embodiment in different forms, there is shown in the Figures, and will be described herein in detail, specific embodiments, with the understanding that the Present Disclosure is to be considered an exemplification of the principles of the Present Disclosure, and is not intended to limit the Present Disclosure to that as illustrated.

[0017] As such, references to a feature or aspect are intended to describe a feature or aspect of an example of the Present Disclosure, not to imply that every embodiment thereof must have the described feature or aspect. Furthermore, it should be noted that the description illustrates a number of features. While certain features have been combined together to illustrate potential system designs, those features may also be used in other combinations not expressly disclosed. Thus, the depicted combinations are not intended to be limiting, unless otherwise noted.

[0018] In the embodiments illustrated in the Figures, representations of directions such as up, down, left, right, front and rear, used for explaining the structure and movement of the various elements of the Present Disclosure, are not absolute, but relative. These representations are appropriate when the elements are in the position shown in the Figures. If the description of the position of the elements changes, however, these representations are to be changed accordingly.

[0019] Referring to Figs. 1-2, an optical fiber assembly such as a multi-fiber lensed ferrule assembly 10 is illustrated. The ferrule assembly includes a ferrule body 11 having a plurality of optical fibers 100 secured thereto. A light or beam expanding element such as lens plate 30 may be fixed to the ferrule body 11. As depicted, ferrule assembly 10 includes two rows of 16 optical fibers 100 although the ferrule assembly may be configured to receive greater or fewer optical fibers if desired.

[0020] Ferrule body 11 is generally rectangular and has a generally planar front face 12, a generally planar rear face 13 and oppositely facing sidewalls 14. Each sidewall 14 may include a latch registration or alignment channel 14a that extends from the front face 12 of the ferrule body 12 towards the rear face 13. A pair of oppositely facing optical fiber receiving nests 15 extend between the front face 12 and the rear face 13. The optical fiber receiving nests 15 are configured to receive the optical fibers 100 in a side-by-side configuration with each of the optical fibers being generally parallel to each other. Each optical fiber receiving nest 15 has an

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 13

optical fiber engaging or registration surface 16 for positioning and supporting each optical fiber 100 positioned within the optical fiber receiving nest 15.

[0021] The registration surface 16 may include a plurality of arcuate or scalloped sections 17. Each arcuate section 17 supports one of the optical fibers 100. If the optical fibers 100 are formed of a plastic material that is generally easily deformed, the arcuate sections 17 are desirable not only to align the optical fibers but also support the optical fibers and prevent their deformation. Deformation of the optical fibers (*e.g.*, changing their cross-section from circular to oval or creating a flat surface) may negatively impact the optical performance of such optical fiber. If the optical fibers 100 inserted into the ferrule body 11 are formed of glass, the arcuate section 17 may not be necessary for supporting the optical fibers to prevent deformation but may still be useful for accurate positioning of each optical fiber.

[0022] Ferrule body 11 may include a pair of alignment holes 18 that extend rearwardly through the front face 12. The alignment holes are positioned on the horizontal centerline of the front face 12. The alignment holes 18 may be generally cylindrical and extend through the ferrule body 11 between the front face 12 and rear face 13. The alignment holes 18 are configured to receive a post (not shown) therein to facilitate alignment when mating a pair of optical fiber assemblies.

[0023] An alignment cover 20 is configured to be received within each optical fiber receiving nest 15 to secure the optical fibers 100 within the optical fiber receiving nest 15. Each alignment cover 20 may be generally rectangular with an outer surface 21 and an oppositely facing inner surface 22. The outer surface 21 may be generally planar and the inner surface 22 may include a plurality of arcuate or scalloped sections 23 that correspond to the arcuate section 17 of the optical fiber receiving nest 15 to position and support the optical fibers 100. As with the arcuate sections 17, when securing plastic optical fiber 100, it may desirable to distribute the forces on the optical fibers to reduce deformation of such fibers.

[0024] If desired, the optical fiber receiving nests 15 and the alignment covers 20 may be tapered to facilitate assembly of the alignment cover 20 to the ferrule body 11. More specifically, the optical fiber receiving nest may be tapered from the front face 12 of the ferrule body 11 to the rear face 13 so that the optical fiber receiving nest 15 is slightly wider adjacent the front face as compared to the rear face. Similarly, the alignment cover 20 may be tapered from its front face 24 to its rear face 25 so that the alignment cover is slightly wider adjacent the front face as

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 14

compared to the rear face. As such, the alignment cover 20 is narrower adjacent its rear face 25 than the optical fiber receiving nest 15 adjacent its front face 12. This configuration permits the alignment cover 20 to be inserted from the front face 12 of the ferrule body 11 and moved rearwardly towards the rear face 13 until the sidewalls 26 of the alignment cover 20 fully engage the inner walls 19 of the ferrule body 11.

[0025] The inner walls 19 of the ferrule body 11 and the sidewalls 26 of alignment cover 20 may be sloped so that insertion of the alignment cover 20 into the optical fiber receiving nest 15 secures the optical fibers in place and the alignment covers do not require any additional latch mechanisms. If desired, the inner walls 19 of the ferrule body 11 and the sidewalls 26 of the alignment cover 20 may also taper or slope downward so that sliding movement of the alignment cover 20 into the optical fiber receiving nest 15 also moves the inner surface 22 of the alignment cover 20 towards the optical fiber registration surface 16 of the optical fiber receiving nest 15.

[0026] Each of the arcuate sections 17 of the optical fiber receiving nest 15 is aligned with one of arcuate sections 23 of the alignment cover 20. The spacing of the arcuate sections 17 along the registration surface 16 of optical fiber receiving nest 15 and the spacing of the arcuate sections 23 along the inner surface 22 of the alignment cover 20 may be set as desired. The arcuate sections 17 and arcuate sections 23 may be configured so that the arrays of optical fibers 100 are uniformly spaced either with adjacent optical fibers touching each other or with a gap between adjacent optical fibers. In a further alternate embodiment, the arcuate sections 17 and arcuate sections 23 may be configured so that the arrays of optical fibers 100 are grouped together with a relatively small space or gap between the groups of optical fibers. This may be desirable to facilitate the termination of plastic optical fibers.

[0027] Ferrule body 11 and the alignment covers 20 may be formed of a resin capable of being injection molded such as polyphenylene sulfide or polyetherimide and may include an additive such as silica (SiO2) to increase the strength and stability of the resin. Other materials may be used as desired.

[0028] Lens plate 30 is generally rectangular and has a front face 32 and a rear face 33. Lens plate 30 may be formed of an optical grade resin that is capable of being injection molded with a refractive index closely matching that of the optical fibers 100. In one example, the lens plate may be formed of Ultem®. A recess 34 may be centrally located in the front face 32 of the lens plate 30 and includes a plurality of lens elements 35. One lens element is aligned with each

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 15

optical fiber 100 when the lens plate 30 is secured to the front face 12 of the ferrule body 11. In the depicted embodiment, the lens elements 35 are of the cross-focusing type and include a convex shape (Fig. 4) projecting from the bottom surface 36 of recess 34 towards the front face 32 of lens plate 30. The rear face 33 of lens plate 30 may be positioned adjacent the front face 12 of ferrule body 11 with an end face 101 of each optical fiber 100 engaging the rear face 33 of lens plate 30.

[0029] A cantilevered arm 37 may project rearwardly from each sidewall 38 of lens plate 30. Arm 37 includes a forward section 39 and a rearward latch arm 40. Forward section 39 is generally linear and extends rearwardly from the front face 32 adjacent the sidewall 38 of lens plate 30. Forward section 39 may be approximately equal in length to ferrule body 11. An inner surface 41 of forward section 39 extends along the sidewall 14 of ferrule body 11. If sidewall 14 of ferrule body 11 includes a latch alignment channel 14a, the inner surface 41 may be dimensioned to be received within the alignment channel. As depicted in Fig. 2, the latch alignment channel 14a does not extend to the rear face 13 of ferrule body 11. Accordingly, inner surface 41 of the forward section 39 has a recess or step 42 adjacent the rear edge 43 of the forward section so that the inner surface 41 extends along and is adjacent to the entire length of the sidewall 14 of ferrule body 11. Other configurations are anticipated.

[0030] Rearward latch arm 40 includes a first angled section 44 that extends rearwardly from the rear edge 43 of the forward section 39 and a generally linear section 45 that extend rearwardly from the first angled section. A latch member 46 is positioned at the intersection of the angled section 44 and the linear section 45 to lock the ferrule assembly 10 to a mating component or adapter 60 as described below. A manually manipulatable projection or tab 47 extends from a rear end of the linear section 45 to permit the rearward latch arm 40 to be deflected so that ferrule assembly 10 may be removed from adapter 60.

[0031] Latch member 46 is somewhat T-shaped and includes a central alignment projection 48 and an engagement section 49 rearward of the alignment projection that is wider than the alignment projection. If desired, the alignment projections 48 of the two arms 37 may be configured with different widths or with one offset from the centerline of the latch member 46 to provide a polarizing feature so that the ferrule assembly 10 may only be inserted into the adapter 60 in one orientation.

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 16

[0032] The alignment projection 48 includes a ramped forward surface 50 and the engagement section 49 includes a ramped surface 51 on opposite sides of the ramped forward surface 50. The ramped forward surface 50 and the ramped surfaces 51 facilitate deflection of the rearward latch arm 40 when inserting the ferrule assembly 10 into a mating component or adapter 60 as described below. The engagement section 49 also includes a rearwardly facing locking surface 52 behind each of the ramped surfaces 51 to lock the ferrule assembly 10 in the adapter 60. If desired, the rearwardly facing locking surface may be sloped or angled so as to provide a forward or mating bias to the ferrule assemblies. More specifically, when the ferrule assembly 10 is inserted into adapter 60, the locking surface 52 engages the rearward edge 67 of the windows 64 and biases the ferrule assembly forward.

[0033] Upon mounting lens plate 30 on ferrule body 11, the forward section 39 of arm 37 extends along the sidewall 14 of ferrule body 11 and the rearward latch arm 40 extends rearwardly of the ferrule body. Accordingly, upon pressing the tab 47 inwardly as shown by arrows "A," the rearward latch arm 40 will be deflected inwardly towards optical fibers 100. The forward section 39 of each arm 37 will remain along the sidewall 14 of the ferrule body 11.

[0034] Lens plate 30 may include a pair of cylindrical guide holes or receptacles 53 that are configured to be aligned with the alignment holes 18 of ferrule body 11. Each guide hole 53 may be configured to have a diameter that matches or is larger than that of the alignment holes 18 of ferrule body 11.

[0035] Lens plate 30 may have a pair of circular spacers or pedestals (not shown) projecting from rear face 33 with one surrounding each guide hole 53. The length of the spacers may be chosen so as to define a consistent and predetermined distance or gap between the front face 12 of ferrule body 11 and the rear face 33 of lens plate 30. A reservoir 54 may be provided in the upper and lower surfaces 55 of lens plate 30 to facilitate the application of an index-matched medium such as an epoxy between the end faces 101 of the optical fibers 100 and the rear face 33 of the lens plate 30.

[0036] A resilient gasket 56 may be secured to the front face 32 of lens plate 30 to seal to some extent the mating interface between a pair of mated ferrule assemblies 10. The gasket 56 as depicted is generally rectangular with a central opening 57 that surrounds the lens elements 35. The gasket 56 may be other shapes depending on the configuration of the mating interface.

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 17

[0037] During assembly, a plurality of optical fibers 100 are positioned within one of the optical fiber receiving nest 15 of ferrule body 11. Each of the optical fibers 100 are positioned so as to engage the arcuate sections 17 of the optical fiber registration surface 16 within the optical fiber receiving nest 15.

[0038] An alignment cover 20 is positioned adjacent optical fiber receiving nest 15 with the rear face 25 of the alignment cover 20 generally adjacent the front face 12 of the ferrule body 11. The alignment cover 20 is positioned so that each of the arcuate sections 23 of the inner surface 22 is aligned with one of the optical fibers 100. The alignment cover 20 may then be moved relative to the ferrule body from the front face 12 towards the rear face 13. The tapered inner walls 19 of the ferrule body 11 and tapered sidewalls 26 of alignment cover 20 will cause the alignment cover 20 to be secured in place with the optical fibers 100 sandwiched between the ferrule body 11 and the alignment cover 20. If desired, an adhesive such as epoxy may be applied to the optical fibers 100 within the optical fiber receiving nest 15 and to inner surface 22 of alignment cover 20 to further secure the ferrule body 11, the alignment cover 20 and the optical fibers 100. If the ferrule body 11 includes an additional optical fiber receiving nest 15, the process may be repeated to secure optical fibers 100 within such optical fiber receiving nest 15.

[0039] After the optical fibers 100 are secured within the optical fiber receiving nests 15 of the ferrule body 11, the optical fibers may be cleaved or terminated generally adjacent front face 12. Additional processing of the end faces 101 of the optical fibers 100 may be performed if desired. For example, if the optical fibers are made of glass, it may be desirable to polish the end faces 101 as is known in the art.

[0040] The lens plate 30 may then be secured to the ferrule body 11 by applying an adhesive between the front face 12 of the ferrule body and the rear face 33 of the lens plate 30. In one embodiment, a fixture (not shown) may be used to position the lens plate 30 adjacent the front face 12 of the ferrule body 11 and an adhesive such as epoxy applied to the reservoir 40 adjacent the upper and lower surfaces 41 of the lens plate 30. The adhesive will travel from the reservoir 40 and along the gap between the front face 12 of ferrule body 11 and the rear face 33 of lens plate 30 to secure the lens plate to the ferrule body and create a uniform gap 42 between the end faces 101 of the optical fibers 100 and the lens elements 35 of the lens plate. In many instances, it may be desirable to utilize an adhesive having an index of refraction that generally matches

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 18

that of the lens plate 30 and the optical fibers 100 to maximize light transmission. If desired, an adhesive such as epoxy may also be applied between the sidewalls 14 of ferrule body 11 and the forward section 39 of each arm 37. Through such a configuration, the arms 37 are integrally formed with the lens plate 30 and function to latch the ferrule assembly 10 to a mating component such as an adapter.

[0041] Referring to Figs. 3-4, an adapter 60 is depicted with one ferrule assembly 10 inserted therein and a second ferrule assembly aligned for insertion. Adapter 60 includes a generally rectangular opening 61 to receive each ferrule assembly 10. A notch or recess 62 extends outwardly from the opening 61 towards each end wall 63. The notches 62 are configured to receive the alignment projections 48 of the latch member 46 to align the ferrule assembly 10 with the adapter 60 during mating. A window or opening 64 is provided in the end walls 63 to lockingly receive the engagement section 49 of the latch member 46 to secure the ferrule assembly 10 within the adapter 60.

[0042] As the ferrule assembly 10 is inserted into the opening 61 in the adapter, the ramped forward surface 50 will engage the outer edge 65 in the notch 62 and the ramped surfaces 51 of the engagement section 49 will engage the outer edge 66 of the opening 61. The angle of the ramped forward surface 50 and the ramped surfaces 51 will cause the rearward latch arm 40 to deflect during the insertion process. The rearward latch arms 40 will remain deflected until the engagement sections 49 are aligned with the windows 64 in the adapter 60. The resiliency of the rearward latch arms 40 will cause the rearward latch arms to spring outward towards their undflected positions and the engagement sections 49 will enter the windows 64. The rearwardly facing locking surfaces 52 of each engagement section 49 will engage a rearward edge 67 of the windows 64 to secure the ferrule assembly 10 within the adapter 60. The ferrule assembly 10 may be removed from the adapter 60 by pressing the tabs 47 inwardly until the rearwardly facing locking surfaces 52 of each engagement section 49 no longer engages the rearward edge 67 of its windows 64.

[0043] In an alternate embodiment depicted in Figs. 5-6, ferrule assembly 70 includes resilient latch arms 72 that are integrally formed with the ferrule body 71. Like reference numbers are used to depict like components and the description thereof is not repeated herein. As such, the forward section 39 of each arm 37 of lens plate 73 is eliminated and the latch arms 72 extend

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 19

from the sidewalls 74 of ferrule body 71. The latch arms 72 and the components thereof function as described above with respect to rearward latch arms 40 of arms 37.

[0044] In an alternate embodiment, the lens plate 30 may be eliminated from the ferrule assembly 70 so that the optical fibers 100 of one ferrule assembly are mated directly with another similarly configured ferrule assembly (not shown).

[0045] While a preferred embodiment of the Present Disclosure is shown and described, it is envisioned that those skilled in the art may devise various modifications without departing from the spirit and scope of the foregoing Description and the appended Claims.

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 20

CLAIMS

WHAT IS CLAIMED IS:

1. An optical fiber assembly comprising:

a plurality of generally parallel optical fibers, each optical fiber having an end face;

a ferrule body having the plurality of optical fibers positioned therein, the ferrule body having a front face, the end face of each optical fiber being positioned generally adjacent the front face of the ferrule body;

a beam expanding element generally adjacent the front face of the ferrule body, the beam expanding element having a lens array aligned with the optical fibers of ferrule body; and

a resilient latch for interconnecting the optical fiber assembly to a mating component, the resilient latch being integrally formed with the beam expanding element.

2. The optical fiber assembly of Claim 1, further including a pair of rearwardly extending, cantilevered resilient latch arms.

3. The optical fiber assembly of Claim 2, wherein each latch arm has a latching projection for engaging a latching shoulder of the mating component.

4. The optical fiber assembly of Claim 1, further including a generally elongated member integrally formed with and extending between the beam expanding element and the resilient latch.

5. The optical fiber assembly of Claim 4, wherein the generally elongated member extends along a sidewall of ferrule body generally from the front face of the ferrule body towards a rear face of the ferrule body.

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 21

6. The optical fiber assembly of Claim 5, wherein the generally elongated member is fixed to the sidewall of the ferrule body.

7. The optical fiber assembly of Claim 5, wherein the generally elongated member is generally non-deflectable.

8. The optical fiber assembly of Claim 1, wherein the mating component is an adapter configured to mate with another ferrule assembly.

9. An optical fiber assembly comprising:

a plurality of generally parallel optical fibers, each optical fiber having an end face;

a ferrule body directly engaging the optical fibers positioned therein, the ferrule body having a front face, the end face of each optical fiber being positioned generally adjacent the front face of the ferrule body;

a beam expanding element generally adjacent the front face of the ferrule body, the beam expanding element having a lens array aligned with the optical fibers of ferrule body, the lens array being spaced from the optical fibers by a predetermined distance; and

a resilient latch for interconnecting the optical fiber assembly to a mating component, the resilient latch being integrally formed with one of the ferrule body and the beam expanding element.

10. The optical fiber assembly of Claim 9, further including a pair of rearwardly extending, cantilevered resilient latch arms.

11. The optical fiber assembly of Claim 10, wherein each latch arm has a latching projection for engaging a latching shoulder of the mating component.

12. The optical fiber assembly of Claim 9, wherein the mating component is an adapter configured to mate with another ferrule assembly.

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 22

13. An optical fiber assembly comprising:

a plurality of generally parallel optical fibers, each optical fiber having an end face;

a ferrule body directly engaging optical fibers positioned therein, the ferrule body having a front face, the end face of each optical fiber being positioned generally adjacent the front face of the ferrule body; and

a resilient latch for interconnecting the optical fiber assembly to a mating component, the resilient latch being integrally formed with the ferrule body.

14. The optical fiber assembly of Claim 13, where in the resilient latch has a pair of rearwardly extending, cantilevered resilient latch arms.

15. The optical fiber assembly of Claim 14, wherein each latch arm has a latching projection for engaging a latching shoulder of the mating component.

16. The optical fiber assembly of Claim 15, wherein the latch arm has a secondary projection for engaging the mating component and biasing the ferrule body towards a mating optical fiber assembly.

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 23

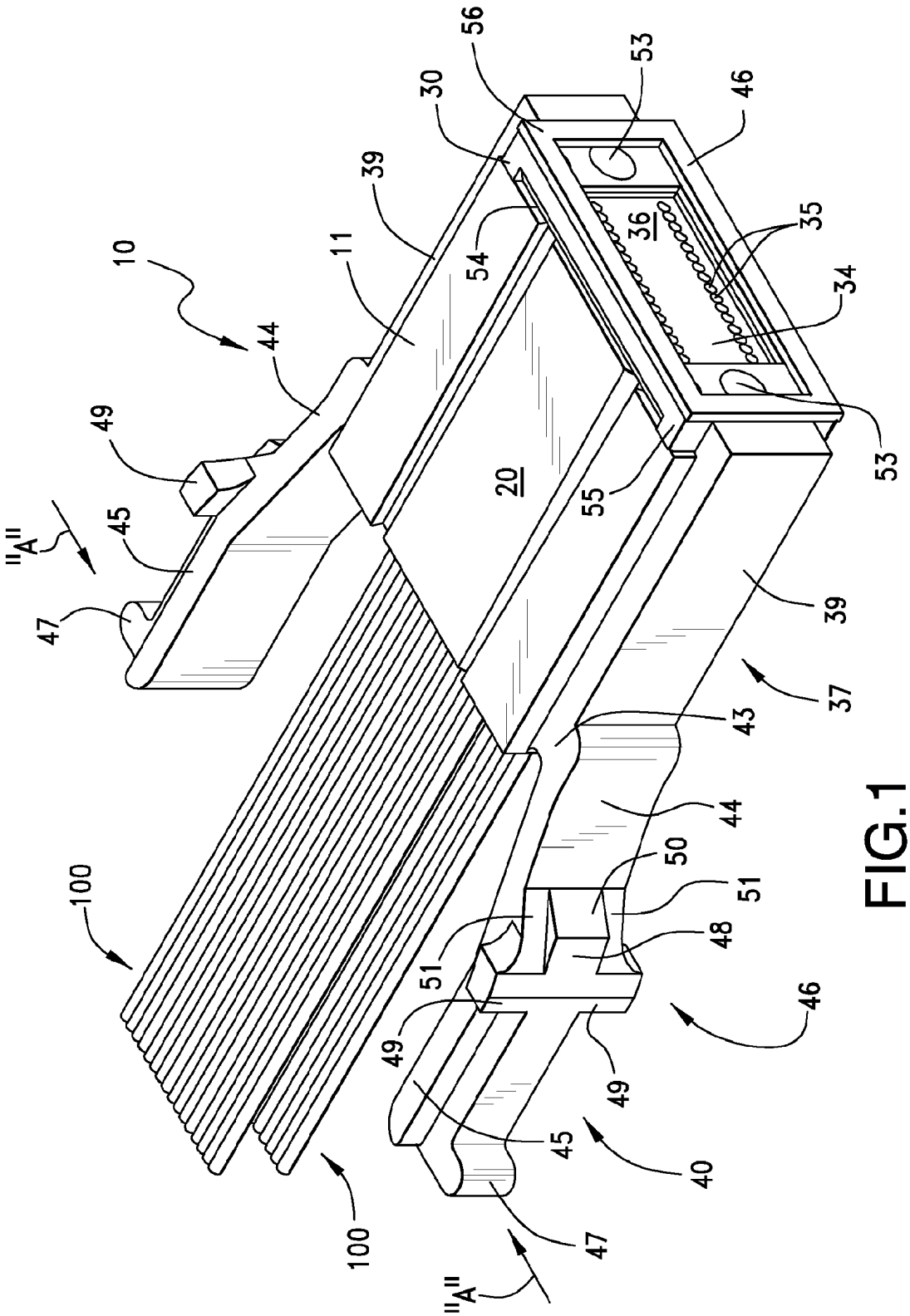


FIG.1

SUBSTITUTE SHEET (RULE 26)
Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 24

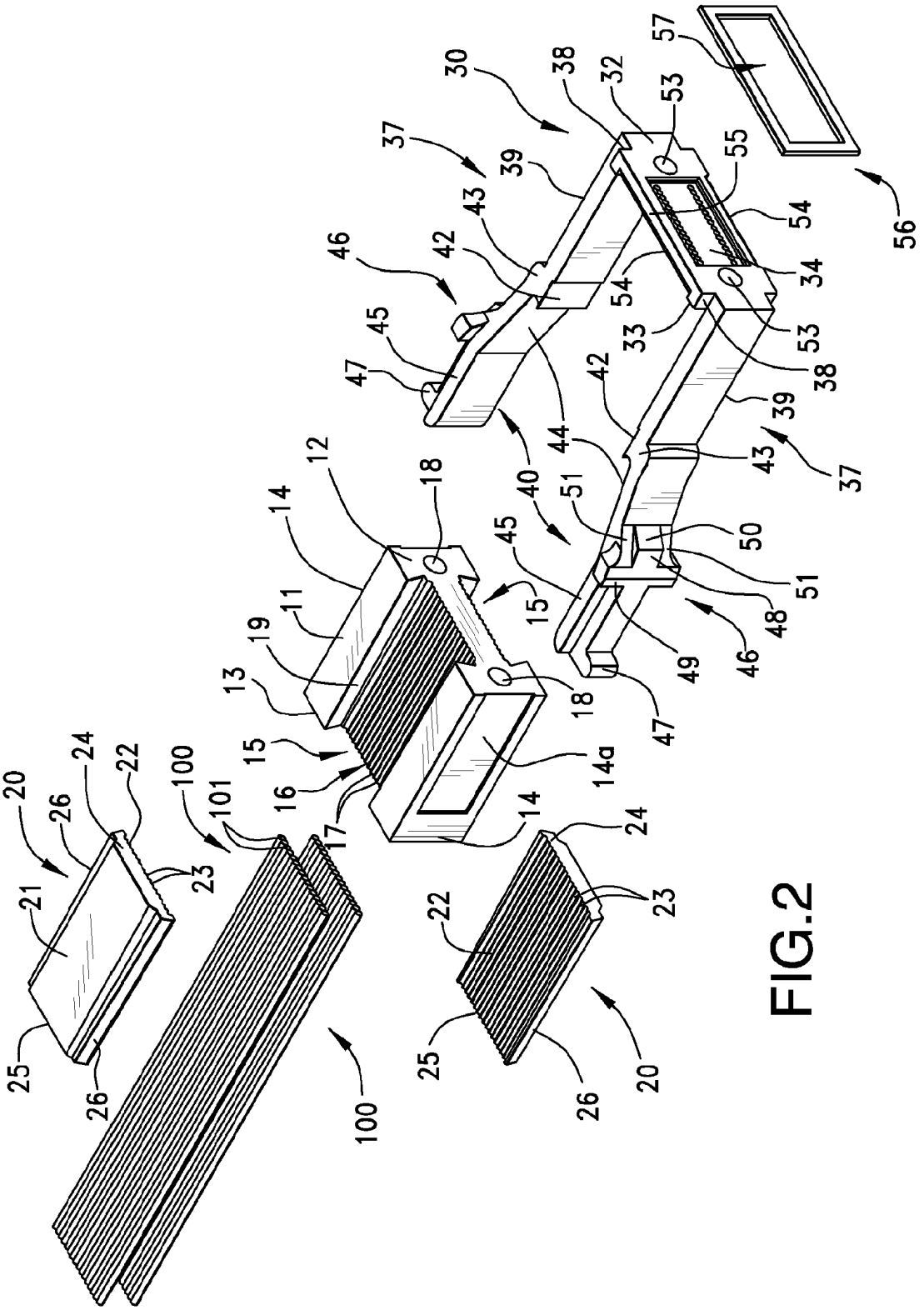


FIG.2

SUBSTITUTE SHEET (RULE 26)
Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 25

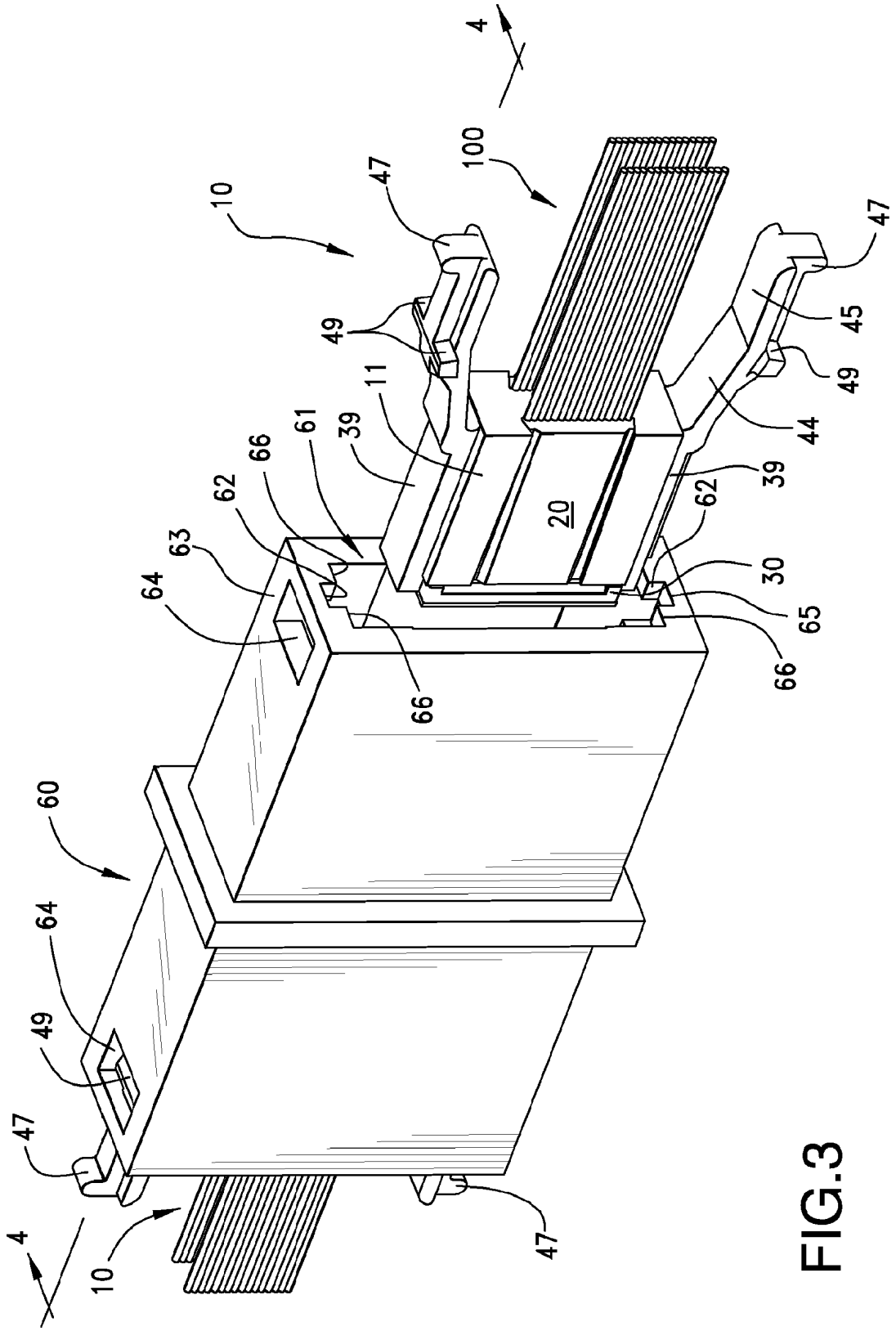


FIG.3

SUBSTITUTE SHEET (RULE 26)
Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 26

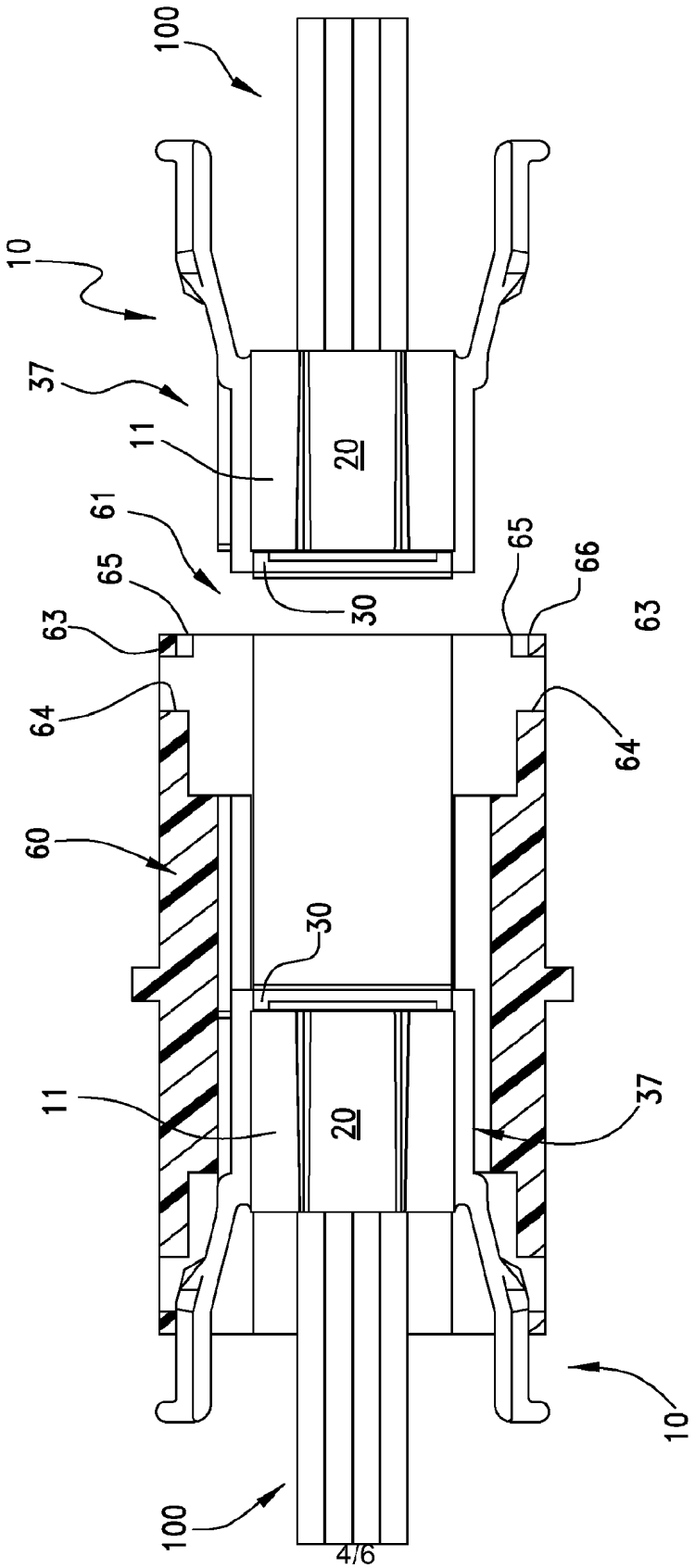


FIG.4

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 27

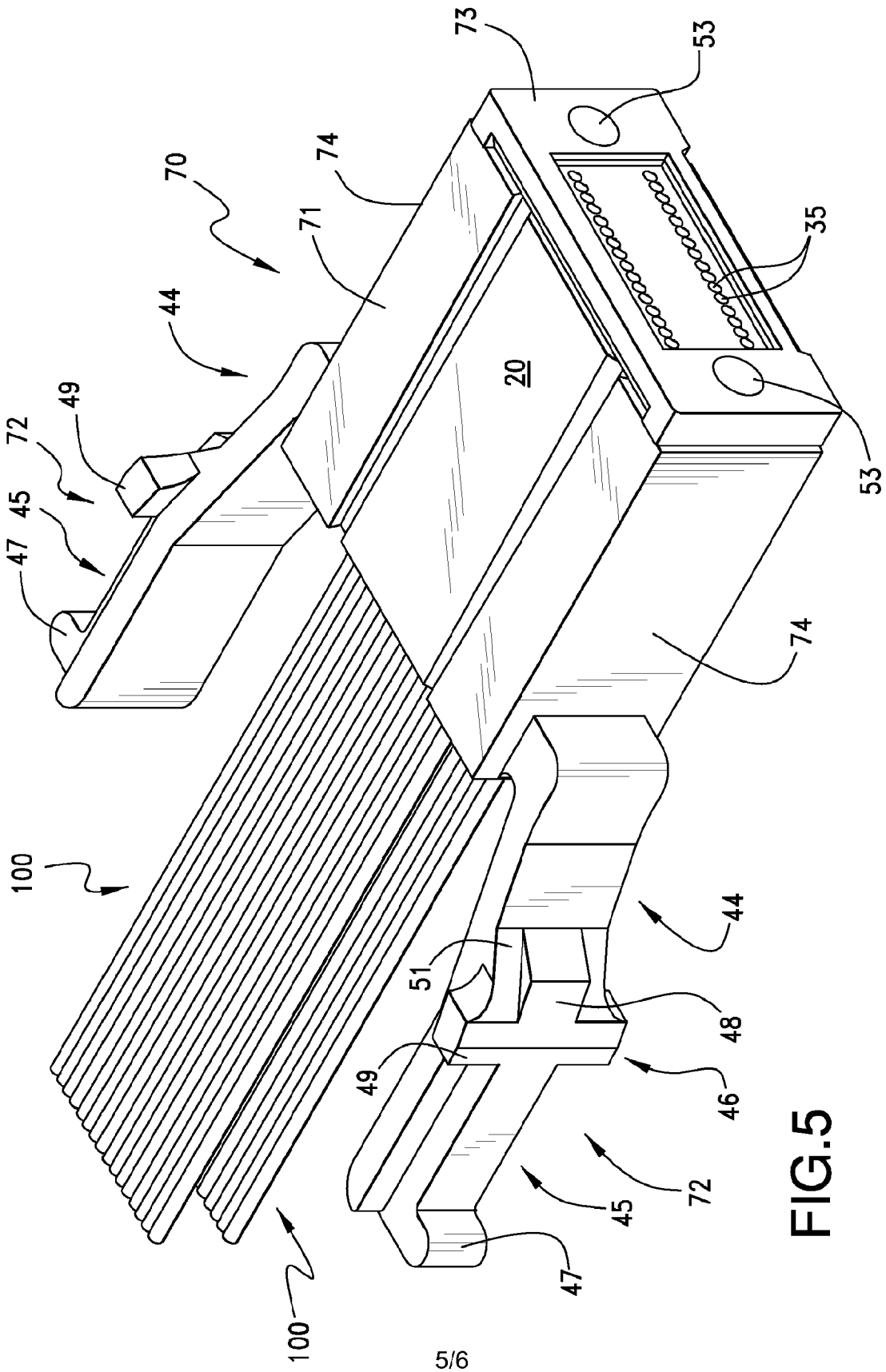


FIG.5

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 28

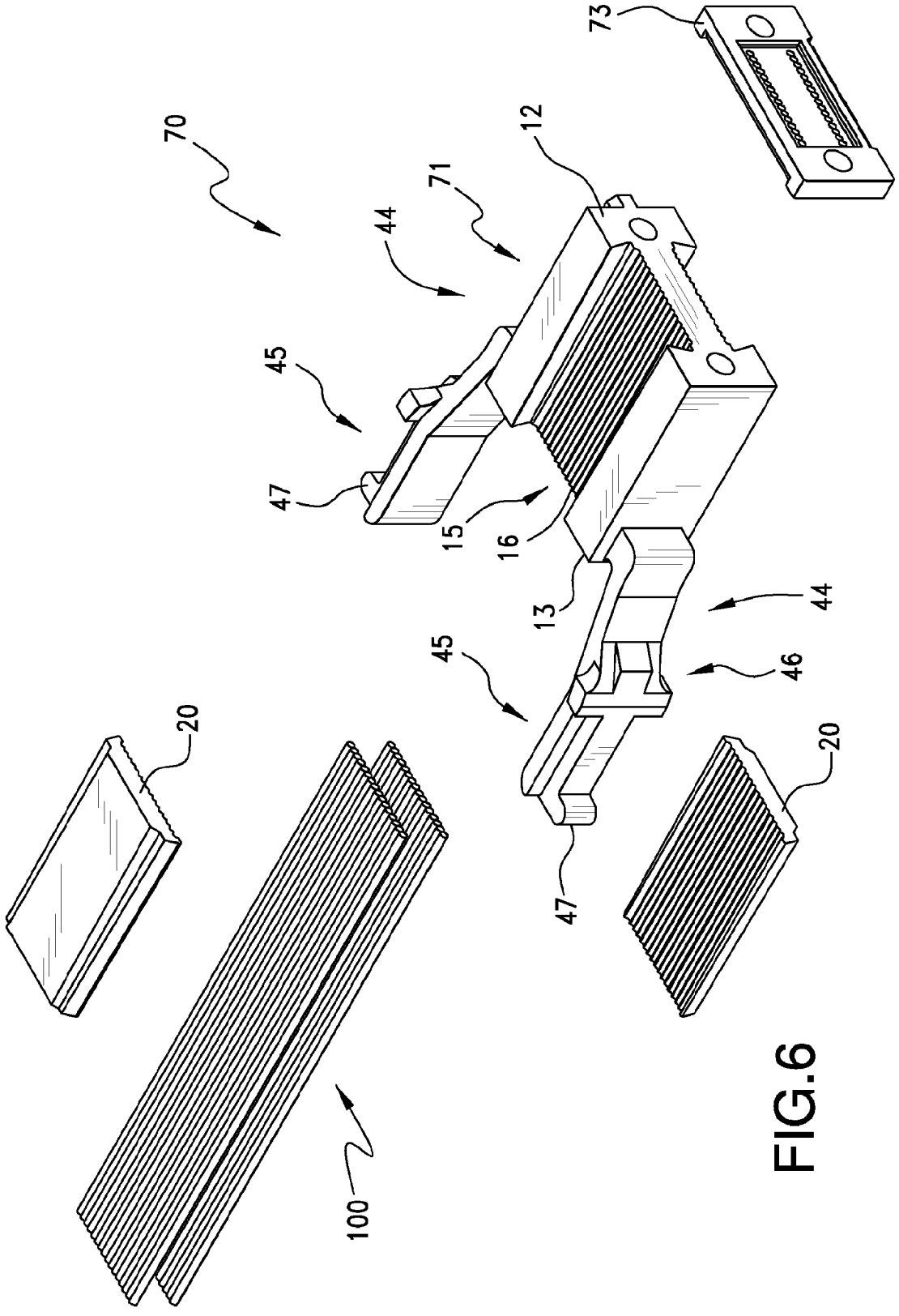


FIG.6

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 29

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/857,300	**06/04/2024 05:32:02 PM Z ET**	**USCO-053-05**

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5557	FILED BY	Michael Leetzow
PATENT CENTER #	65825744	FILING DATE	07/05/2022
CUSTOMER #	152017	FIRST NAMED INVENTOR	Hiep V. Nguyen
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	-

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
AllRevisedFigs.pdf	4	Drawings-only black and white line drawings	272 KB
AmendJune2024.pdf	12	Amendment/Request for Reconsideration-After Non-Final Rejection	178 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
AllRevisedFigs.pdf	0627A3AE8B7AB028CD6B46F366CF5ADD3C28671F2497A452C

	D9743324E9A29EBA575A29C7365AD33ABD271BA2F44184543 34303223C0C74AA33C92E4016309B0
AmendJune2024.pdf	49D2C32E9B15DC89AD32C8B7136519BE419C231113B7ED082 AE8C853843572F153F43FC5F32A3984A8C2F5A7BBD18FFF227 12E3E8D80F3F11D41465E419037D7

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 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.

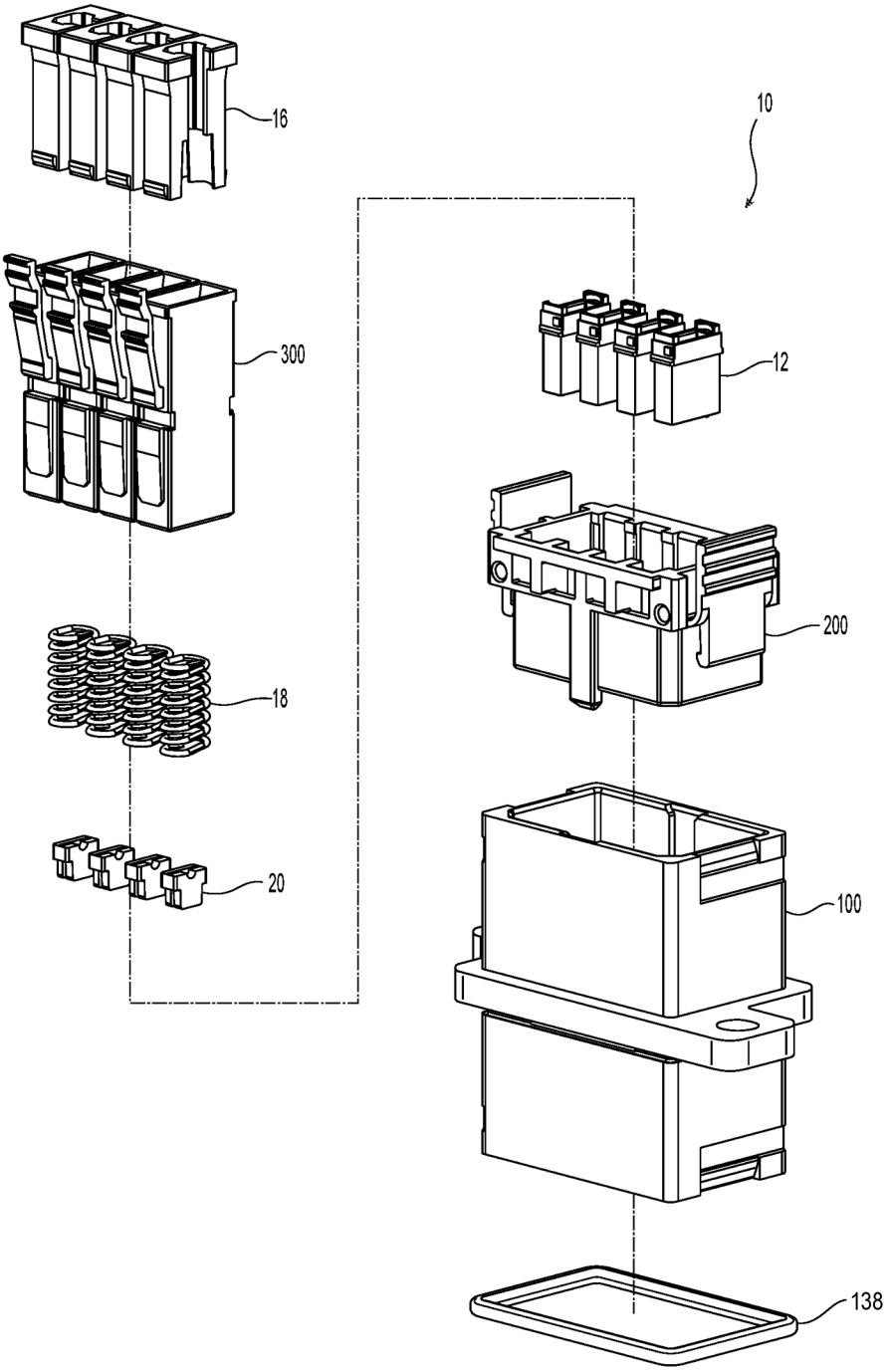


Fig. 2

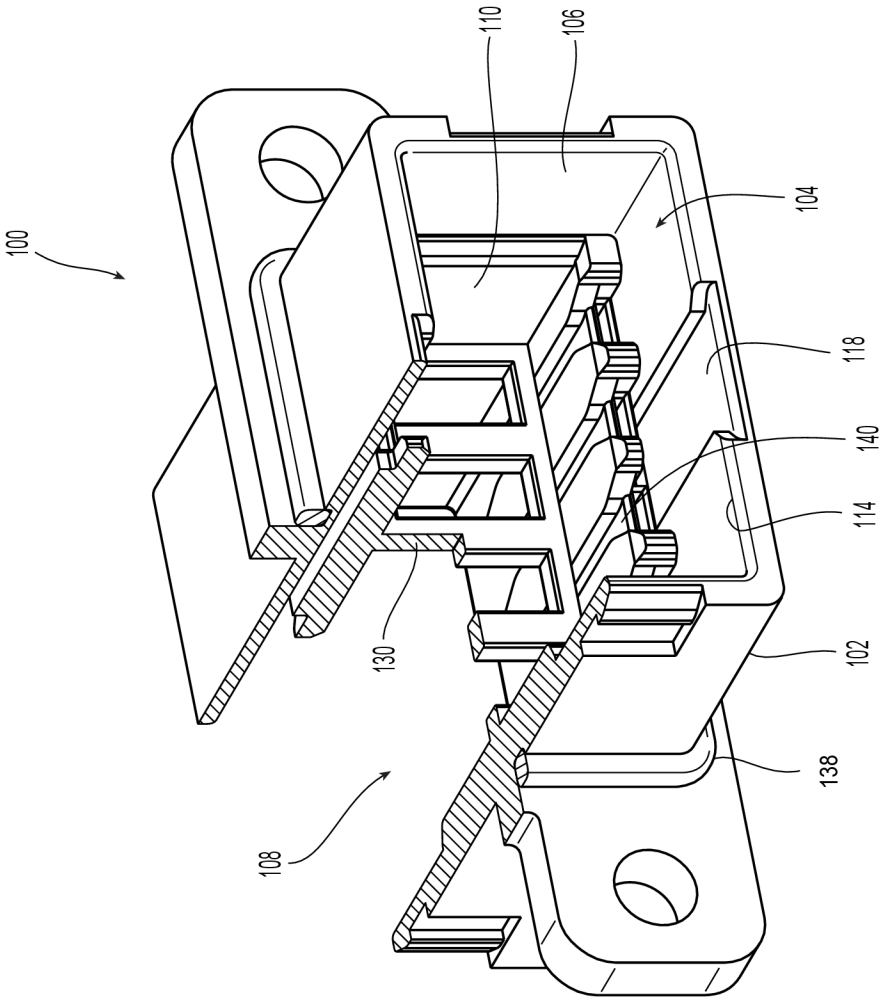


Fig. 3

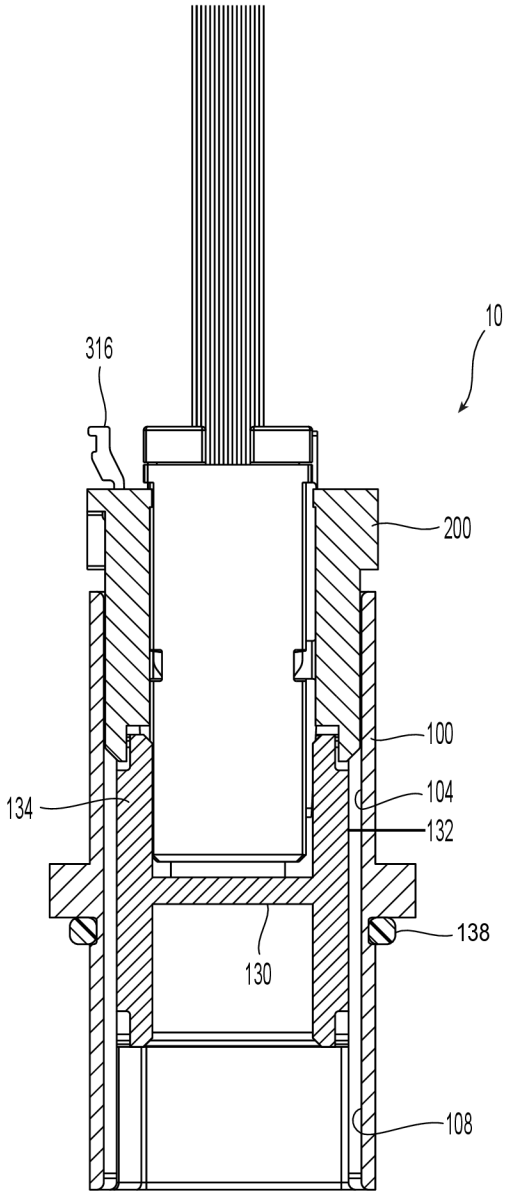


Fig. 8

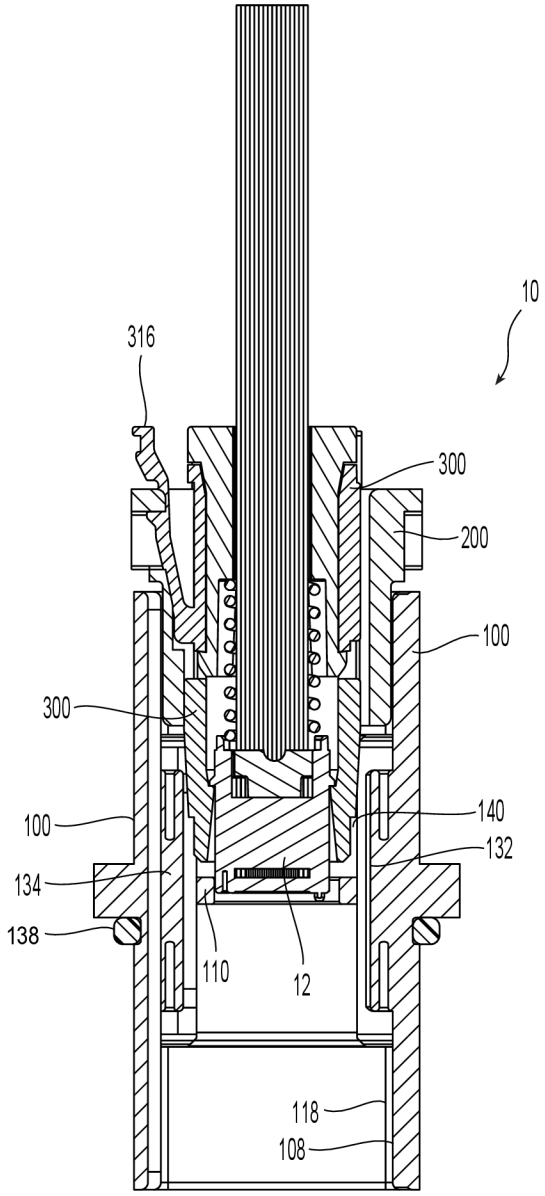


Fig. 9

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Hiep V. Nguyen	)
		) Group Art Unit: 2874
Serial No.:	17/857,300	)
		) Examiner: Rojas, Omar R.
Filing Date:	July 5, 2022	)
		)
Title:	Alignment Adapter and Alignment Design for a Connector Therefor	)

Commissioner for Patents
PO Box 1450
Arlington VA 22313-1450

AMENDMENT

Further to the Amendment filed on January 15, 2024, Applicant amends the application as follows:

IN THE SPECIFICATION:

Please amend paragraph [00027] as provided below:

As illustrated in Figs. 5A-C, the ferrule holder **300** has a main body **302** with a central opening **304** that extends from a first end **306** to a second end **308** to house the fiber optic ferrules **12**. The first end **306** has an opening **310** therein to allow access to the ferrule **12**. The ferrule **12** may or may not exit the main body **302**. That is, the ferrule **12** may extend beyond the main body **302** as shown in the figures or it may be flush with the first end **306**. second end **308** allows for the optical fibers **14** (shown in Fig. 5A and 5B to have a boot and a covering) to exit the ferrule holder **300**. The ferrule holder **300** has a top surface **312** and a bottom surface **314**, with a cantilevered latch **316** to engage the plug **200**. The top surface **312** has a projection **320** and the bottom surface **314** has a projection **322**. The projections **320,322** are preferably elongated and have a chamfered front end. The projections **320,322** are used to engage grooves in the plug **200** and the adapter **100** to position the ferrule holders **300** with precision in the adapter **100** <u>in respective channels that are adjacent each other</u>. The projection **320** has a width that is different that the width of projection **322** so as to act as a key in inserting the ferrule holder **300** in the plug **200**. While the projection **320** is wider than projection **322**, it could be opposite in that projection **320** is more narrow than projection **322**. The projections **320,322** are preferably on the top and the bottom surfaces **312,314** of the ferrule holder **300** to allow, as illustrated below, more ferrule holders to be inserted into the adapter **100** and the plug **200**. The projections **320,322** are used to position the ferrules **12** in the adapter in the x and y directions, eliminating the need for side walls to position the ferrule holders **300** and the ferrules **12**.

Please amend paragraph [00033] as provided below:

The adapter has the center portion **110**. Center portion **110** preferably has a wall **130** that extends across the opening **104** in the adapter **100** and divides the center portion **110** in half. The center portion **110** also has a raised bottom portion **132** and a dropped top portion

134 that narrows the opening **104** in the center portion **110**. The wall **130** preferably extends from the raised bottom portion **132** and a dropped top portion **134** or it may be excluded completely if there is no EMI concerns with the adapter **100**. The wall **130** has a plurality of openings **136** that are sized to allow the ferrules **12** to pass therethrough to engage a corresponding ferrule **12**. As noted above, if the ferrules **12** only extend to the end of the ferrule holder **330**, then the openings **136** should be sized to allow the ferrule holders to also extend therethrough. The adapter **100** may also have an elastomeric gasket ~~**150** that~~ **138** that encircles an external surface of the adapter **100** to provide EMI shielding.

IN THE DRAWINGS:

Please replace Figs. 2, 3, 8, and 9 with the attached revised figures. Applicant has amended the drawings and the specification to correct a reference numeral in the figure. No new matter has been added.

IN THE CLAIMS:

1. (Currently Amended) An adapter for holding fiber optic connectors, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located between the first side and the opposing second side, a first fiber optic connector from the first side mating with a second fiber optic connector from the opposing second side within the central portion,

a first internal groove of the first top wall extending ~~from the~~ between the first side ~~toward the central portion~~ and the second side; and

a second internal groove of the first bottom wall also extending ~~from the~~ between the first side and the second side ~~toward the central portion~~,

wherein the first internal groove has a first width and the second internal groove has a second width, the first width is greater than the second width, wherein the adapter is free of internal walls outwardly of the central portion in a space between the opposing side walls along the width and between the first top wall and the first bottom wall along the height, and wherein the main body includes at least two channels on the first side to respectively receive the first fiber optic connector and an additional fiber optic connector side-by-side with the first fiber optic connector without any internal walls therebetween, and wherein the main body includes at least two channels on the opposing second side to respectively receive the second fiber optic connector and another additional fiber optic connector side-by-side with the second fiber optic connector without any internal walls therebetween.

2. (Original) The adapter of claim 1, wherein the central portion includes a wall extending across the opening in the adapter.

3. (Original) The adapter of claim 2, wherein the wall divides the central portion in half.

4. (Original) The adapter of claim 2, wherein the wall has passageways sized to allow respective ferrules from the first fiber optic connector and the second fiber optic connector to engage.

5. (Original) The adapter of claim 1, wherein the first top wall has a dropped top portion and the first bottom wall has a raised bottom portion for mitigating electromagnetic interference (EMI).

6. (Original) The adapter of claim 1, wherein the first top wall and the first bottom wall have a smooth plane structure in the central portion.

7. (Original) The adapter of claim 6, further comprising a wall in the central portion extending across the opening in the adapter.

8. (Original) The adapter of claim 7, wherein the wall has passageways sized to allow respective ferrules from the first fiber optic connector and the second fiber optic connector to engage.

9. (Original) The adapter of claim 1, wherein the main body has a width to receive one fiber optic connector to four fiber optic connectors.

10. (Currently Amended) An adapter for aligning fiber optic ferrules inserted from opposing sides comprising:

a main body having an opening extending between a first side and a second side, the first side and the second side separated by a central portion; and

at least one groove in a top surface and at least one groove in a bottom surface of the main body extending longitudinally ~~toward the central portion from each of~~ between the first side and the second side,

wherein the adapter is configured such that a first fiber optic ferrule is received at the first side and a second fiber optic ferrule is received at the second side of the adapter for alignment by a projection associated with each of the first and second fiber optic ferrules the at least one groove at the top surface and the bottom surface of the main body, and wherein the adapter is configured to mate at least four fiber optic ferrules in pairs with space for at least two fiber optic ferrules on the first side without any internal walls of the adapter therebetween and at least two fiber optic ferrules on the second side without any internal walls of the adapter therebetween, including the first fiber optic ferrule and the second fiber optic ferrule.

11. (Original) The adapter of claim 10, wherein the at least one groove is sized differently on the top surface than on the bottom surface.

12. (Original) The adapter of claim 10, wherein the first fiber optic ferrule is disposed partially inside a first ferrule holder, and

wherein the at least one groove is sized to match a projection on an outside surface of the first ferrule holder for alignment.

13. (Original) The adapter of claim 10, wherein the central portion includes a wall extending across the opening in the adapter.

14. (Original) The adapter of claim 13, wherein the wall divides the central portion in half.

15. (Currently Amended) An adapter for aligning a first fiber optic connector having a first fiber optic ferrule inserted from a first side and a second fiber optic connector having a second fiber optic ferrule inserted from a second side, comprising:

a main body having an opening defined by two opposing side walls, a top surface and a bottom surface joining the two opposing side walls, the opening extending between the first side and the second side, the first side configured to receive the first fiber optic connector and the second side configured to receive the second fiber optic connector;

a central portion inside the main body located between the first side and the second side, the first fiber optic connector and the second fiber optic connector mating in a region of the central portion; and

a first groove disposed on the top surface and a second groove disposed on the bottom surface on each of the first side and the second side, each of the first groove and the second groove extending ~~toward the central portion from each of~~ between the first side and the second side,

wherein the first groove has a dimension different from the second groove, and wherein the main body includes at least two channels on the first side to respectively receive the first fiber optic connector and an additional fiber optic connector side-by-side with the first fiber optic connector without any internal walls therebetween, and wherein the main body includes at least two channels on the second side to respectively receive the second fiber optic connector and another additional fiber optic connector side-by-side with the second fiber optic connector without any internal walls therebetween.

16. (Original) The adapter of claim 15, wherein the first groove is wider than the second groove.

17. (Original) The adapter of claim 15, wherein the dimension of the first groove matches a dimension of a projection of the first fiber optic connector for alignment.

18. (Currently Amended) An adapter for holding fiber optic connectors, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located between the first side and the opposing

second side, the main body configured to receive a first plurality of fiber optic ~~connector~~ connectors from the first side for mating with a second plurality of fiber optic ~~connector~~ connectors from the opposing second side within the central portion, each of the first and second plurality of fiber optic connectors having projections; and

a first plurality of internal grooves on ~~each of~~ the first side and a second plurality of internal grooves on the opposing second side within a space of the adapter, each of the plurality of internal grooves configured to receive a respective projection to align the first plurality of fiber optic connectors with ~~connector and~~ the second plurality of fiber optic connectors ~~connector~~ in the main body ~~and also align an additional fiber optic connector side-by-side with the first fiber optic connector~~ without any internal walls ~~therebetween to an additional fiber optic connector side-by-side with the second fiber optic connector without any internal walls~~ therebetween within the width of the adapter.

19. (Original) The adapter of claim 18, wherein the plurality of internal grooves are sized to receive a respective projection on each of the first fiber optic connector and the second fiber optic connector for alignment.

20. (Original) The adapter of claim 18, wherein the plurality of internal grooves extend longitudinally in a direction toward the central portion.

21. Canceled.

22. (New) An adapter for holding fiber optic connectors, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

the main body configured to receive a first plurality of fiber optic connectors from the first side and a second plurality of fiber optic connectors from the opposing second side, wherein the each of the first and second plurality of fiber optic connectors have projections;

a central portion inside the main body located between the first side and the opposing second side, wherein the central portion is configured such that fiber optic connectors received from the first side of the main body mate with fiber optic connectors received from the second side of the main body within the central portion; and

a first plurality of internal grooves on the first side of the main body and a second plurality of internal grooves on the opposing second side of the main body, each of the plurality of internal grooves configured to receive a respective projection on a fiber optic connector and to align the first plurality of fiber optic connectors with the second plurality of fiber optic connectors in the main body without any internal walls therebetween within the width of the adapter.

REMARKS

In the above-referenced Office Action, the Examiner accepted the Terminal Disclaimer; objected to the specification; rejected claims 1, 5, 6, 9-12, and 15-21 under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Patent No. 6,146,023 to Weigel et al. in view of Patent Pub. No. US 2012/0057824 A1 to Katoh; rejected claims 2-4, 7, 8, 13, and 14 under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Weigel in view of Katoh as applied to claim 1, 6, or 10 above, and further in view of Patent No. 4,645,295 to Pronovost.

Applicant has amended the independent claims in the present application to further the prosecution of the case; canceled claim 21 and added new claim 22. None of the cited or identified references disclose or suggest the claims as now pending.

In rejecting claims 1, 5, 6, 9-12, and 15-21 under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Weigel et al. in view of Katoh, the Examiner alleged that Weigel et al. discloses all of the elements of claim 1, except Weigel et al does not teach a second internal groove of the first bottom wall also extending from the first side toward the central portion, wherein the second internal groove has a second width less than the first width. For that element, the Examiner relied on Katoh. The Examiner alleged that it teaches an optical connector (1) having first and second keys (52, 51) wherein the second key (51) has a second width less than a first width of the first key (52) as seen in FIG. 9 of Katoh. Katoh further discloses an adapter (7) that would comprise first and second internal grooves for receiving corresponding keys (52, 51) of the connector (1).

Applicant submits that the references, alone or together, fail to disclose or suggest the claimed invention. Claim 1 requires that the adapter has a first internal groove of the first top wall extending between the first side and the second side, and a second internal groove of the first bottom wall also extending between the first side and the second side. However, the adapter (7) in Katoh does not have the second internal groove in the adapter. Fig. 5 only shows the first internal groove 6. Fig. 10 also only shows the upper groove 106 with a flat grooveless bottom for the adapter 107. Finally Fig. 12 shows the upper groove 106 in adapter 107. The Examiner appears to referencing the outer housing 3 of the optical connector 1 and not the adapter 7 in Katoh. Thus, Katoh still does not cure the deficiencies in Weigel et al., and the combination of

the two references fail to disclose or suggest the claimed invention. The same is true of claims 10, 15, 18 (a plurality of grooves) and 22.

Applicant also disagrees with the combination of the references, but since the claims are otherwise allowable, will not burden the record with the arguments that the Examiner has not provided an adequate motivation for combing the references.

For at least these reasons, Applicant submits that the pending claims are allowable.

Respectfully submitted,

/Michael L. Leetzow/
Michael L. Leetzow PLLC
Registration No. 35,932
1205 S Keswick Dr.
Troy, VA 22974
Telephone: 407/302-9970

Date: June 4, 2024

DocCode - SCORE

Placeholder Sheet for Supplemental Content

Application Number: 17857300 Document Date: 06/04/2024

The presence of this form indicates that the following document type was received in electronic format on the date identified above. This document is stored separately from the typical case contents which are stored in image format.

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded and no paper documents or physical media exist.

- Drawing

At the time of document entry (noted above):

- USPTO employees may access this supplemental content via Docket Application Viewer (DAV) or Supplemental Content Viewer (SCV).
- External customers may access this supplemental content via Patent Center.

Form Revision Date: March 1, 2024

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 17/857,300	Filing Date 07/05/2022	☐ 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 $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ 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	06/04/2024	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 5	Minus	*** 5	= 0		x $480 =	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		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ 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.	Supervisory Prog. Sup. Spec.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/LISA E FULTON/
*** 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.	

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.

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.
17/857,300	07/05/2022	Hiep V. Nguyen	USCO-053-05	5557

152017 7590 03/07/2024

US Conec Ltd.
1138 25th Street Southeast
Hickory, NC 28602

EXAMINER
ROJAS, OMAR R

ART UNIT	PAPER NUMBER
2874	

NOTIFICATION DATE	DELIVERY MODE
03/07/2024	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@usconec.com
eofficeaction@appcoll.com
michael@leetzow.com

UNITED STATES DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR/ PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
17/857,300	07/05/2022	Nguyen et al.	USCO-053-05

		EXAMINER	
US Conec Ltd. 1138 25th Street Southeast Hickory, NC 28602		Omar R Rojas	
		ART UNIT	PAPER
		2874	20240304

DATE MAILED: _____

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

Commissioner for Patents

The supplemental reply filed on March 1, 2024 was not entered because supplemental replies are not entered as a matter of right except as provided in 37 CFR 1.111(a)(2)(ii). Applicant's prior reply filed on January 15, 2024 has already been considered. Since the supplemental reply is nonresponsive to the Office action mailed on March 4, 2024, a reply that is responsive to the mailed Office action must be timely filed in order to avoid abandonment.

/Omar R Rojas/
Primary Examiner, Art Unit 2874

PTO-90C (Rev.04-03)

03/04/2024

DO NOT ENTER: /ORR/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Hiep V. Nguyen	)	
		)	Group Art Unit: 2874
Serial No.:	17/857,300	)	
		)	Examiner: Rojas, Omar R.
Filing Date:	July 5, 2022	)	
		)	
Title:	Alignment Adapter and Alignment Design for a Connector Therefor	)	

Commissioner for Patents
PO Box 1450
Arlington VA 22313-1450

AMENDMENT

Further to the Amendment filed on January 15, 2024, Applicant amends the application as follows:

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.
17/857,300	07/05/2022	Hiep V. Nguyen	USCO-053-05	5557

152017 7590 03/04/2024

US Conec Ltd.
1138 25th Street Southeast
Hickory, NC 28602

EXAMINER
ROJAS, OMAR R

ART UNIT	PAPER NUMBER
2874	

NOTIFICATION DATE	DELIVERY MODE
03/04/2024	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@usconec.com
eofficeaction@appcoll.com
michael@leetzow.com

Office Action Summary	Application No. 17/857,300	Applicant(s) Nguyen et al.	
	Examiner Omar R Rojas	Art Unit 2874	AIA (FITF) 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 January 15, 2024.

☐ 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) 1-21 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) 1-21 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 _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

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

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

Priority under 35 U.S.C. § 119

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

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

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

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

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

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

Attachment(s)

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

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

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

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Response to Amendment

2. With regards to the amendment filed on January 15, 2024, all the requested changes to the claims have been entered. Applicant's constructive efforts to advance prosecution are appreciated. Claim(s) 1-21 are pending.

Terminal Disclaimer

3. The terminal disclaimer filed on January 15, 2024 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date(s) of Patent No. 10,156,684 and Patent No. 10,890,723 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Response to Arguments

4. Applicant's arguments with respect to claim(s) 1-21 have been considered but are moot because the new ground of rejection does not rely on any reference applied in the prior rejection of record for any teaching or matter specifically challenged in the argument.

Specification

5. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The specification, as originally filed, does not mention any "channels" as recited by claims 1 and 15.

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 1, 5, 6, 9-12, and 15-21 is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Patent No. 6,146,023 to Weigel et al. (hereinafter "Weigel") in view of Patent Pub. No. US 2012/0057824 A1 to Katoh ("Katoh"). Katoh was made of record in a previously filed Information Disclosure Statement.

In re claim 1, Weigel discloses an adapter/coupling sleeve (40) for holding fiber optic connectors (4), see FIGS. 1-3, the adapter (40) comprising:

a main body, see FIG 3, having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located between the first side and the opposing second side, a first fiber optic connector (4) from the first side mating with a second fiber optic connector (4) from the opposing second side within the central portion,

a first internal groove of the first top wall extending from the first side toward the central portion for receiving a coding rib (30b); and

wherein the first internal groove has a first width, wherein the adapter (40) is free of internal walls outwardly of the central portion in a space between the opposing side walls along the width and between the first top wall and the first bottom wall along the height, and wherein the main body includes at least two channels on the first side to respectively receive the first

fiber optic connector (4) and an additional fiber optic connector (4) side-by-side with the first fiber optic connector (4) without any internal walls therebetween, and wherein the main body includes at least two channels on the opposing second side to respectively receive the second fiber optic connector (4) and another additional fiber optic connector (4) side-by-side with the second fiber optic connector (4) without any internal walls therebetween. *See* columns 3-5 of Weigel for further details.

Thus, Weigel only differs from claim 1 in that he does not teach a second internal groove of the first bottom wall also extending from the first side toward the central portion, wherein the second internal groove has a second width less than the first width. Katoh, on the other hand, teaches an optical connector (1) having first and second keys (52, 51) wherein the second key (51) has a second width less than a first width of the first key (52) as seen in FIG. 9 of Katoh. Katoh further discloses an adapter (7) that would comprise first and second internal grooves for receiving corresponding keys (52, 51) of the connector (1). The keying arrangement of Katoh is useful for distinguishing different connectors and for preventing optical connectors from being connected to different adapters. *See* paragraphs [0020]-[0023] of Katoh. In order to prevent other optical connectors from being connected to his adapter (40), Weigel would have been modified to include a second internal groove in the first bottom wall extending from the first side toward the central portion wherein the second internal groove has a second width less than the first width, per the suggestion of Katoh, thereby obtaining the invention specified by claim 1. Therefore, it would have been obvious to one ordinary skill in the art before the effective filing date of the claimed invention to obtain the invention specified by claim 1 in view of Weigel combined with Katoh.

In re claim 5, as seen in FIG. 3 of Weigel, the first top wall has a dropped top portion surrounding a raised portion of the first top wall that defines first internal groove and the first bottom wall would have been modified to have a raised bottom portion symmetrical to the raised portion of Weigel for mitigating electromagnetic interference (EMI) by providing the second internal groove on the first bottom wall for the reasons mentioned with respect to claim 1.

In re claim 6, as seen in FIG. 3 of Weigel, the first top wall and the first bottom wall have at least a partially smooth plane structure in the central portion.

In re claim 9, as seen in FIG. 3 of Weigel the main body has a width to receive one fiber optic connector (4) to four fiber optic connectors (4).

In re claim 10, Weigel discloses an adapter (40) for aligning fiber optic ferrules (4) inserted from opposing sides, see FIGS. 1-3, comprising:

a main body, see FIG. 3, having an opening extending between a first side and a second side, the first side and the second side separated by a central portion; and

at least one groove in a top surface of the main body extending longitudinally toward the central portion from each of the first side and the second side for receiving coding rib (30b),

wherein the adapter (40) is configured such that a first fiber optic ferrule (4) is received at the first side and a second fiber optic ferrule (4) is received at the second side of the adapter (40) for alignment by the at least one groove at the top surface of the main body, and

wherein the adapter (40) is configured to mate at least four fiber optic ferrules (4) in pairs with space for at least two fiber optic ferrules (4) on the first side without any internal walls of

the adapter (40) therebetween and at least two fiber optic ferrules (4) on the second side without any internal walls of the adapter (40) therebetween, including the first fiber optic ferrule (4) and the second fiber optic ferrule (4). *See* columns 3-5 of Weigel for further details.

Thus, Weigel only differs from claim 10 in that he does not teach and at least one groove in a bottom surface of the main body extending longitudinally toward the central portion from each of the first side and the second side for aligning the ferrules (4). Katoh, as previously discussed, discloses an adapter (7) that would comprise at least one groove in a top surface of a main body of the adapter at least one groove in a bottom surface of the main body for aligning connectors (1) using first and second keys (52, 51). *See* FIGS. 2-9 of Katoh. The keying arrangement of Katoh is useful for distinguishing different connectors and for preventing optical connectors from being connected to different adapters. *See* paragraphs [0020]-[0023] of Katoh. In order to prevent other optical connectors from being connected to his adapter (40), Weigel would have been modified to include at least one groove in a bottom surface of the main body extending longitudinally toward the central portion from each of the first side and the second side for aligning the ferrules (4), per the suggestion of Katoh, thereby obtaining the invention specified by claim 10. Therefore, it would have been obvious to one ordinary skill in the art before the effective filing date of the claimed invention to obtain the invention specified by claim 10 in view of Weigel combined with Katoh.

In re claim 11, Katoh further teaches using differently sized grooves on the top surface than on the bottom surface of his adapter (7). It would have also been obvious to use differently sized grooves in Weigel for the same reasons mentioned with respect to claim 10.

In re claim 12, as seen in FIG. 2 of Weigel, the first fiber optic ferrule (4) is disposed partially inside a first ferrule holder (30), and wherein the at least one groove is sized to match a projection/rib (30b) on an outside surface of the first ferrule holder (30) for alignment.

In re claim 15, Weigel discloses an adapter (40) for aligning a first fiber optic connector (4) having a first fiber optic ferrule (4) inserted from a first side and a second fiber optic connector (4) having a second fiber optic ferrule (4) inserted from a second side, see FIGS. 1-3, comprising:

a main body having an opening defined by two opposing side walls, a top surface and a bottom surface joining the two opposing side walls, the opening extending between the first side and the second side, the first side configured to receive the first fiber optic connector (4) and the second side configured to receive the second fiber optic connector (4);

a central portion inside the main body located between the first side and the second side, the first fiber optic connector (4) and the second fiber optic connector (4) mating in a region of the central portion; and

a first groove disposed on the top surface on each of the first side and the second side, the first groove extending toward the central portion from each of the first side and the second side,

wherein the main body includes at least two channels on the first side to respectively receive the first fiber optic connector (4) and an additional fiber optic connector (4) side-by-side with the first fiber optic connector (4) without any internal walls therebetween, and wherein the main body includes at least two channels on the second side to respectively receive the second fiber optic connector (4) and another additional fiber optic connector (4) side-by-side with the

second fiber optic connector (4) without any internal walls therebetween. *See* columns 3-5 of Weigel for further details.

Thus, Weigel only differs from claim 15 in that he does not teach a second groove disposed on the bottom surface on each of the first side and the second side extending toward the central portion from each of the first side and the second side, wherein the first groove has a dimension different from the second groove. Katoh, as previously discussed, discloses an adapter (7) that would comprise a different sized grooves disposed in a top surface and a bottom surface of a main body of the adapter (7) for aligning connectors (1) using first and second keys (52, 51). *See* FIGS. 2-9 of Katoh. The keying arrangement of Katoh is useful for distinguishing different connectors and for preventing optical connectors from being connected to different adapters. *See* paragraphs [0020]-[0023] of Katoh. In order to prevent other optical connectors from being connected to his adapter (40), Weigel would have been modified to include a second groove disposed on the bottom surface on each of the first side and the second side extending toward the central portion from each of the first side and the second side, wherein the first groove has a dimension different from the second groove, per the suggestion of Katoh, thereby obtaining the invention specified by claim 15. Therefore, it would have been obvious to one ordinary skill in the art before the effective filing date of the claimed invention to obtain the invention specified by claim 15 in view of Weigel combined with Katoh.

In re claim 16, the first groove of Katoh is wider than the second groove in order to receive the first key (52) that is wider than the second key (51) of connector (1). Therefore, the invention

specified by claim 16 is also considered obvious for the same reasons mentioned with respect to claim 15.

In re claim 17, as seen in FIG. 3 of Weigel, the dimension of the first groove matches a dimension of a projection (30b) of the first fiber optic connector (4) for alignment.

In re claim 18, Weigel discloses an adapter (40) for holding fiber optic connectors (4), see FIGS. 1-3, the adapter (40) comprising:

a main body having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located between the first side and the opposing second side, a first fiber optic connector (4) from the first side mating with a second fiber optic connector (4) from the opposing second side within the central portion; and

an internal groove on each of the first side and the opposing second side within a space of the adapter (40), the internal groove configured to align the first fiber optic connector (4) and the second fiber optic connector (4) in the main body and also align an additional fiber optic connector (4) side-by-side with the first fiber optic connector (4) without any internal walls therebetween to an additional fiber optic connector (4) side-by-side with the second fiber optic connector (4) without any internal walls therebetween within the width of the adapter (40). *See* columns 3-5 of Weigel for further details.

Thus, Weigel only differs from claim 18 in that he does not teach a plurality of internal grooves on each of the first side and the opposing second side. Katoh, as previously discussed, discloses an adapter (7) that would comprise a plurality of internal grooves on each of the first side and the opposing second side of the adapter (7) for aligning fiber optic connectors (1) having first and second keys (52, 51). *See* FIGS. 2-9 of Katoh. The keying arrangement of Katoh is useful for distinguishing different connectors and for preventing optical connectors from being connected to different adapters. *See* paragraphs [0020]-[0023] of Katoh. In order to prevent other optical connectors from being connected to his adapter (40), Weigel would have been modified to include a plurality of internal grooves on each of the first side and the opposing second side, per the suggestion of Katoh, thereby obtaining the invention specified by claim 18. Therefore, it would have been obvious to one ordinary skill in the art before the effective filing date of the claimed invention to obtain the invention specified by claim 18 in view of Weigel combined with Katoh.

In re claim 19, as seen in FIG. 3 of Weigel, the internal groove is sized to receive a respective projection/rib (30b) on each of the first fiber optic connector (4) and the second fiber optic connector (4) for alignment. Since it would have been obvious to use a plurality of internal grooves in Weigel, the invention specified by claim 19 is also considered obvious for the same reasons mentioned with respect to claim 18.

In re claim 20, as seen in FIG. 3 of Weigel, the internal groove extends longitudinally in a direction toward the central portion. Since it would have been obvious to use a plurality of

internal grooves in Weigel, the invention specified by claim 20 is also considered obvious for the same reasons mentioned with respect to claim 18.

In re claim 21, Weigel discloses an adapter (40) for optical fiber communications, see FIGS. 1-3, the adapter (40) comprising:

a main body having a width and a height and an opening extending longitudinally from a first side into the main body, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located longitudinally inward from the first side,

at least two channels on the first side, each of the at least two channels configured to respectively receive one of at least two fiber optic connectors (4) from the first side for an optical connection within the central portion,

a first internal groove of the first top wall extending toward the central portion; and

wherein the adapter (40) is free of internal walls between the at least two channels on the first side. *See* columns 3-5 of Weigel for further details.

Thus, Weigel only differs from claim 21 in that he does not teach a second internal groove of the first bottom wall extending toward the central portion, the second internal groove being on a same side of the opening as the first internal groove, wherein the first internal groove has a first width and the second internal groove has a second width, the first width is greater than the second width. Katoh, as previously discussed, discloses an adapter (7) that would comprise a

second internal groove of a first bottom wall extending toward a central portion, the second internal groove being on a same side of the opening as a first internal groove, wherein the first internal groove has a first width and the second internal groove has a second width, the first width is greater than the second width for aligning fiber optic connectors (1) having first and second keys (52, 51). *See* FIGS. 2-9 of Katoh. The keying arrangement of Katoh is useful for distinguishing different connectors and for preventing optical connectors from being connected to different adapters. *See* paragraphs [0020]-[0023] of Katoh. In order to prevent other optical connectors from being connected to his adapter (40), Weigel would have been modified to include a second internal groove on the first bottom wall extending toward the central portion, the second internal groove being on a same side of the opening as the first internal groove, wherein the first internal groove has a first width and the second internal groove has a second width, the first width is greater than the second width, per the suggestion of Katoh, thereby obtaining the invention specified by claim 21. Therefore, it would have been obvious to one ordinary skill in the art before the effective filing date of the claimed invention to obtain the invention specified by claim 21 in view of Weigel combined with Katoh.

8. Claims 2-4, 7, 8, 13, and 14 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Weigel in view of Katoh as applied to claim 1, 6, or 10 above, and further in view of Patent No. 4,645,295 to Pronovost ("Pronovost"). Pronovost was applied in a prior Office action.

In re claims 2, 7, and 13, Weigel in view of Katoh only differs in that Weigel does not disclose that the central portion of his adapter (40) includes a wall extending across the opening in the adapter (40). Pronovost, however, teaches an adapter (10) comprising a central portion that

includes a wall/spacer (72) extending across an opening in the adapter (10) that maintains a short distance between optical fibers (28A). *See* col. 6, line 43 to col. 7, line 4 of Pronovost. In order to maintain an appropriate distance between the fiber optic connectors (4), the central portion of the adapter (40) of Weigel in view of Katoh would have also included a wall extending across the opening in the adapter (40), per the teachings of Pronovost, thereby obtaining the invention specified by claims 2, 7, and 13. Therefore, it would have been obvious to one ordinary skill in the art before the effective filing date of the claimed invention to obtain the invention specified by claims 2, 7, and 13 in view of Weigel combined with Katoh, and further in view of Pronovost.

In re claims 3 and 14, as seen in FIG. 3 of Pronovost, the wall (72) divides the central portion of his adapter (10) in half. Therefore, it would have also been obvious to obtain the invention specified by claims 3 and 14 for the same reasons mentioned with respect to claims 2 and 13.

In re claims 4 and 8, as seen in FIG. 1 of Pronovost, the wall (72) has passageways (84) sized to allow respective ferrules from a first fiber optic connector (16) and a second fiber optic connector (16) to engage. Therefore, it would have also been obvious to obtain the invention specified by claims 4 and 7 for the same reasons mentioned with respect to claims 2 and 7.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Omar R. Rojas whose telephone number is (571)272-2357. The examiner can normally be reached Monday-Friday, 10AM-6PM EST.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is

encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas 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.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Omar R Rojas/
Primary Examiner
Art Unit 2874

or
February 27, 2024

Examiner-Initiated Interview Summary	**Application No.** 17/857,300	**Applicant(s)** Nguyen et al.		
	Examiner Omar R Rojas	**Art Unit** 2874	**AIA (First Inventor to File) Status** No	**Page** 1 of 1

All Participants (applicant, applicants representative, PTO personnel)	**Title**	**Type**
Omar R Rojas	Primary Examiner	Telephonic
Michael L. Leetzow	Attorney of Record	

Date of Interview: 05 February 2024

Issues Discussed:

Proposed Amendment(s)

The examiner contacted Mr. Leetzow to propose adding "a plurality of grooves that extend across the central portion and configured to align ferrule holders" to each of the independent claims in view of newly found prior art to Weigel. (Pat. No. 6,146,023). To date, however, no agreement to the proposed amendment has been reached.

/Omar R Rojas/ Primary Examiner, Art Unit 2874	

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04
Please further see:
MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

Notice of References Cited	Application/Control No. 17/857,300	Applicant(s)/Patent Under Reexamination Nguyen et al.	
	Examiner Omar R Rojas	Art Unit 2874	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Name	CPC Classification	US Classification
*	A	US-6146023-A	2000-11-14	Weigel; Hans-Dieter	G02B6/3879	385/139
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	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 YYYY-MM-DD format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/857,300	Nguyen et al.
	Examiner	Art Unit
	Omar R Rojas	2874

CPC - Searched*		
Symbol	Date	Examiner
G02B6/3825,3831,3879	09/11/2023	/ORR/

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
Checked refs. for 17/145,864.	07/14/2023	/ORR/
G02B6/3825,3831,3879 limited by CPC query - PE2E Search History Printout.	09/11/2023	/ORR/
Updated above - See PE2E Search History Printout.	01/08/2024	/ORR/
Updated PE2E search from 17/145,864 - See Search History Printout .	01/08/2024	/ORR/
PE2E SEARCH (PGPUB,USPAT) - See Search History Printout.	01/31/2024	/ORR/

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/Omar R Rojas/ Primary Examiner, Art Unit 2874	

Senko Advanced Components v. US Conec Ltd
Senko EX1025-A
Page 70

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/857,300	Nguyen et al.
	Examiner	**Art Unit**
	Omar R Rojas	2874

/Omar R Rojas/ Primary Examiner, Art Unit 2874	

Senko Advanced Components v. LIS Cogec Ltd.
Senko EX1025-A
Page 71

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1822	32	("20030063862"|"20040117981"|"20090226140"|"20110019962"|"20120177326"|"20130183004"|"20130209041"|"20130216188"|"20130301994"|"20140147081"|"20140331464"|"20140348468"|"5283848"|"5796896"|"5971625"|"6146023"|"6259856"|"6331079"|"6357928"|"6422760"|"6461053"|"6572276"|"8500470"|"8641293"|"8873921"|"8998505"|"9057845"|"9086546"|"9146351"|"9494744"|"9519114"|"9568689").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2024/01/31 04:08 PM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

Senko Advanced Components v. US Conec, Ltd.
Senko EX1025-A
Page 72

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/857,300	**03/01/2024 11:37:14 AM Z ET**	**USCO-053-05**

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5557	FILED BY	Michael Leetzow
PATENT CENTER #	64515978	FILING DATE	07/05/2022
CUSTOMER #	152017	FIRST NAMED INVENTOR	Hiep V. Nguyen
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	-

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
AmendFeb2024.pdf	8	Supplemental Response or Supplemental Amendment	148 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
AmendFeb2024.pdf	4B62E355D0C55B8C79A039E2C60986D4D1B89A570B92450EA C18037C8DC7BA0C29AD06748DCCD9DEA72EE0ED24107578 9587FD8A9D6AA292E6E53FFEB4F5F1AC

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 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Hiep V. Nguyen	)
		) Group Art Unit: 2874
Serial No.:	17/857,300	)
		) Examiner: Rojas, Omar R.
Filing Date:	July 5, 2022	)
		)
Title:	Alignment Adapter and Alignment Design for a Connector Therefor	)

Commissioner for Patents
PO Box 1450
Arlington VA 22313-1450

AMENDMENT

Further to the Amendment filed on January 15, 2024, Applicant amends the application as follows:

IN THE CLAIMS:

1. (Currently Amended) An adapter for holding fiber optic connectors, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located between the first side and the opposing second side, a first fiber optic connector from the first side mating with a second fiber optic connector from the opposing second side within the central portion,

a first internal groove of the first top wall extending ~~from the~~ between the first side ~~toward the central portion~~ and the second side; and

a second internal groove of the first bottom wall also extending ~~from the~~ between the first side and the second side ~~toward the central portion~~,

wherein the first internal groove has a first width and the second internal groove has a second width, the first width is greater than the second width, wherein the adapter is free of internal walls outwardly of the central portion in a space between the opposing side walls along the width and between the first top wall and the first bottom wall along the height, and wherein the main body includes at least two channels on the first side to respectively receive the first fiber optic connector and an additional fiber optic connector side-by-side with the first fiber optic connector without any internal walls therebetween, and wherein the main body includes at least two channels on the opposing second side to respectively receive the second fiber optic connector and another additional fiber optic connector side-by-side with the second fiber optic connector without any internal walls therebetween.

2. (Original) The adapter of claim 1, wherein the central portion includes a wall extending across the opening in the adapter.

3. (Original) The adapter of claim 2, wherein the wall divides the central portion in half.

4. (Original) The adapter of claim 2, wherein the wall has passageways sized to allow respective ferrules from the first fiber optic connector and the second fiber optic connector to engage.

5. (Original) The adapter of claim 1, wherein the first top wall has a dropped top portion and the first bottom wall has a raised bottom portion for mitigating electromagnetic interference (EMI).

6. (Original) The adapter of claim 1, wherein the first top wall and the first bottom wall have a smooth plane structure in the central portion.

7. (Original) The adapter of claim 6, further comprising a wall in the central portion extending across the opening in the adapter.

8. (Original) The adapter of claim 7, wherein the wall has passageways sized to allow respective ferrules from the first fiber optic connector and the second fiber optic connector to engage.

9. (Original) The adapter of claim 1, wherein the main body has a width to receive one fiber optic connector to four fiber optic connectors.

10. (Currently Amended) An adapter for aligning fiber optic ferrules inserted from opposing sides comprising:

a main body having an opening extending between a first side and a second side, the first side and the second side separated by a central portion; and

at least one groove in a top surface and at least one groove in a bottom surface of the main body extending longitudinally ~~toward the central portion from each of~~ between the first side and the second side,

wherein the adapter is configured such that a first fiber optic ferrule is received at the first side and a second fiber optic ferrule is received at the second side of the adapter for alignment by a projection associated with each of the first and second fiber optic ferrules the at least one groove at the top surface and the bottom surface of the main body, and wherein the adapter is configured to mate at least four fiber optic ferrules in pairs with space for at least two fiber optic ferrules on the first side without any internal walls of the adapter therebetween and at least two fiber optic ferrules on the second side without any internal walls of the adapter therebetween, including the first fiber optic ferrule and the second fiber optic ferrule.

11. (Original) The adapter of claim 10, wherein the at least one groove is sized differently on the top surface than on the bottom surface.

12. (Original) The adapter of claim 10, wherein the first fiber optic ferrule is disposed partially inside a first ferrule holder, and

wherein the at least one groove is sized to match a projection on an outside surface of the first ferrule holder for alignment.

13. (Original) The adapter of claim 10, wherein the central portion includes a wall extending across the opening in the adapter.

14. (Original) The adapter of claim 13, wherein the wall divides the central portion in half.

15. (Currently Amended) An adapter for aligning a first fiber optic connector having a first fiber optic ferrule inserted from a first side and a second fiber optic connector having a second fiber optic ferrule inserted from a second side, comprising:

a main body having an opening defined by two opposing side walls, a top surface and a bottom surface joining the two opposing side walls, the opening extending between the first side and the second side, the first side configured to receive the first fiber optic connector and the second side configured to receive the second fiber optic connector;

a central portion inside the main body located between the first side and the second side, the first fiber optic connector and the second fiber optic connector mating in a region of the central portion; and

a first groove disposed on the top surface and a second groove disposed on the bottom surface on each of the first side and the second side, each of the first groove and the second groove extending ~~toward the central portion from each of~~ between the first side and the second side,

wherein the first groove has a dimension different from the second groove, and wherein the main body includes at least two channels on the first side to respectively receive the first fiber optic connector and an additional fiber optic connector side-by-side with the first fiber optic connector without any internal walls therebetween, and wherein the main body includes at least two channels on the second side to respectively receive the second fiber optic connector and another additional fiber optic connector side-by-side with the second fiber optic connector without any internal walls therebetween.

16. (Original) The adapter of claim 15, wherein the first groove is wider than the second groove.

17. (Original) The adapter of claim 15, wherein the dimension of the first groove matches a dimension of a projection of the first fiber optic connector for alignment.

18. (Currently Amended) An adapter for holding fiber optic connectors, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located between the first side and the opposing

second side, the main body configured to receive a first plurality of fiber optic ~~connector~~ connectors from the first side for mating with a second plurality of fiber optic ~~connector~~ connectors from the opposing second side within the central portion, each of the first and second plurality of fiber optic connectors having projections; and

a first plurality of internal grooves on ~~each of~~ the first side and a second plurality of internal grooves on the opposing second side within a space of the adapter, each of the plurality of internal grooves configured to receive a respective projection to align the first plurality of fiber optic connectors with ~~connector and~~ the second plurality of fiber optic connectors ~~connector~~ in the main body ~~and also align an additional fiber optic connector side-by-side with the first fiber optic connector~~ without any internal walls ~~therebetween to an additional fiber optic connector side-by-side with the second fiber optic connector without any internal walls~~ therebetween within the width of the adapter.

19. (Original) The adapter of claim 18, wherein the plurality of internal grooves are sized to receive a respective projection on each of the first fiber optic connector and the second fiber optic connector for alignment.

20. (Original) The adapter of claim 18, wherein the plurality of internal grooves extend longitudinally in a direction toward the central portion.

21. Canceled.

22. (New) An adapter for holding fiber optic connectors, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

the main body configured to receive a first plurality of fiber optic connectors from the first side and a second plurality of fiber optic connectors from the opposing second side, wherein the each of the first and second plurality of fiber optic connectors have projections;

a central portion inside the main body located between the first side and the opposing second side, wherein the central portion is configured such that fiber optic connectors received from the first side of the main body mate with fiber optic connectors received from the second side of the main body within the central portion; and

a first plurality of internal grooves on the first side of the main body and a second plurality of internal grooves on the opposing second side of the main body, each of the plurality of internal grooves configured to receive a respective projection on a fiber optic connector and to align the first plurality of fiber optic connectors with the second plurality of fiber optic connectors in the main body without any internal walls therebetween within the width of the adapter.

REMARKS

Applicant has amended the claims in the present application to further the prosecution of the case. None of the cited or identified references disclose or suggest the claims as now pending. Applicant requests that the Examiner pass the application to issue.

Respectfully submitted,

/Michael L. Leetzow/
Michael L. Leetzow PLLC
Registration No. 35,932
1205 S Keswick Dr.
Troy, VA 22974
Telephone: 407/302-9970

Date: March 1, 2024

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 17/857,300	Filing Date 07/05/2022	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) 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 $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ 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	03/01/2024	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 5	Minus	*** 5	= 0		x $480 =	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		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ 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.	SLIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/JULIET MCMILLAN/
*** 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.	

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.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 17/857,300	Filing Date 07/05/2022	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) 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 $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ 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	03/01/2024	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 5	Minus	*** 5	= 0		x $480 =	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		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ 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.	SLIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/JULIET MCMILLAN/
*** 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.	

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.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/857,300	**01/15/2024 05:36:02 PM Z ET**	**USCO-053-05**

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5557	FILED BY	Michael Leetzow
PATENT CENTER #	63953327	FILING DATE	07/05/2022
CUSTOMER #	152017	FIRST NAMED INVENTOR	Hiep V. Nguyen
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	-

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
AmendUSCO5305Jan2024.pdf	8	Amendment/Request for Reconsideration-After Non-Final Rejection	132 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
AmendUSCO5305Jan2024.pdf	24D368A5BD852A238DC39DF0F73069EAD5002F854F693B33E7FA22313C5186420B948C091EE333ACCEF0D37A1F77ADDFED3F8D45DE13D8C166CD4525D16A767D

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 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Hiep V. Nguyen	) Group Art Unit: 2874
Serial No.:	17/857,300	) Examiner: Rojas, Omar R.
Filing Date:	July 5, 2022	)
Title:	Alignment Adapter and Alignment Design for a Connector Therefor	)

Commissioner for Patents
PO Box 1450
Arlington VA 22313-1450

AMENDMENT

In response to the Office Action mailed on January 12, 202, Applicant amends the application as follows:

IN THE CLAIMS:

1. (Previously Presented) An adapter for holding fiber optic connectors, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located between the first side and the opposing second side, a first fiber optic connector from the first side mating with a second fiber optic connector from the opposing second side within the central portion,

a first internal groove of the first top wall extending from the first side toward the central portion; and

a second internal groove of the first bottom wall also extending from the first side toward the central portion,

wherein the first internal groove has a first width and the second internal groove has a second width, the first width is greater than the second width, wherein the adapter is free of internal walls outwardly of the central portion in a space between the opposing side walls along the width and between the first top wall and the first bottom wall along the height, and wherein the main body includes at least two channels on the first side to respectively receive the first fiber optic connector and an additional fiber optic connector side-by-side with the first fiber optic connector without any internal walls therebetween, and wherein the main body includes at least two channels on the opposing second side to respectively receive the second fiber optic connector and another additional fiber optic connector side-by-side with the second fiber optic connector without any internal walls therebetween.

2. (Original) The adapter of claim 1, wherein the central portion includes a wall extending across the opening in the adapter.

3. (Original) The adapter of claim 2, wherein the wall divides the central portion in half.

4. (Original) The adapter of claim 2, wherein the wall has passageways sized to allow respective ferrules from the first fiber optic connector and the second fiber optic connector to engage.

5. (Original) The adapter of claim 1, wherein the first top wall has a dropped top portion and the first bottom wall has a raised bottom portion for mitigating electromagnetic interference (EMI).

6. (Original) The adapter of claim 1, wherein the first top wall and the first bottom wall have a smooth plane structure in the central portion.

7. (Original) The adapter of claim 6, further comprising a wall in the central portion extending across the opening in the adapter.

8. (Original) The adapter of claim 7, wherein the wall has passageways sized to allow respective ferrules from the first fiber optic connector and the second fiber optic connector to engage.

9. (Original) The adapter of claim 1, wherein the main body has a width to receive one fiber optic connector to four fiber optic connectors.

10. (Currently Amended) An adapter for aligning fiber optic ferrules inserted from opposing sides comprising:

a main body having an opening extending between a first side and a second side, the first side and the second side separated by a central portion; and

at least one groove in a top surface and at least one groove in a bottom surface of the main body extending longitudinally toward the central portion from each of the first side and the second side,

wherein the adapter is configured such that a first fiber optic ferrule is received at the first side and a second fiber optic ferrule is received at the second side of the adapter for alignment by the at least one groove at the top surface and the bottom surface of the main body, and wherein the adapter is configured to mate at least four fiber optic ferrules in pairs with space for at least two fiber optic ferrules on the first side without any internal walls of the adapter therebetween and at least two fiber optic ferrules on the second side without any internal walls of the adapter therebetween, including the first fiber optic ferrule and the second fiber optic ferrule.

11. (Original) The adapter of claim 10, wherein the at least one groove is sized differently on the top surface than on the bottom surface.

12. (Original) The adapter of claim 10, wherein the first fiber optic ferrule is disposed partially inside a first ferrule holder, and

wherein the at least one groove is sized to match a projection on an outside surface of the first ferrule holder for alignment.

13. (Original) The adapter of claim 10, wherein the central portion includes a wall extending across the opening in the adapter.

14. (Original) The adapter of claim 13, wherein the wall divides the central portion in half.

15. (Previously Presented) An adapter for aligning a first fiber optic connector having a first fiber optic ferrule inserted from a first side and a second fiber optic connector having a second fiber optic ferrule inserted from a second side, comprising:

a main body having an opening defined by two opposing side walls, a top surface and a bottom surface joining the two opposing side walls, the opening extending between the first side and the second side, the first side configured to receive the first fiber optic connector and the second side configured to receive the second fiber optic connector;

a central portion inside the main body located between the first side and the second side,

the first fiber optic connector and the second fiber optic connector mating in a region of the central portion; and

a first groove disposed on the top surface and a second groove disposed on the bottom surface on each of the first side and the second side, each of the first groove and the second groove extending toward the central portion from each of the first side and the second side,

wherein the first groove has a dimension different from the second groove, and wherein the main body includes at least two channels on the first side to respectively receive the first fiber optic connector and an additional fiber optic connector side-by-side with the first fiber optic connector without any internal walls therebetween, and wherein the main body includes at least two channels on the second side to respectively receive the second fiber optic connector and another additional fiber optic connector side-by-side with the second fiber optic connector without any internal walls therebetween.

16. (Original) The adapter of claim 15, wherein the first groove is wider than the second groove.

17. (Original) The adapter of claim 15, wherein the dimension of the first groove matches a dimension of a projection of the first fiber optic connector for alignment.

18. (Previously Presented) An adapter for holding fiber optic connectors, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located between the first side and the opposing second side, a first fiber optic connector from the first side mating with a second fiber optic connector from the opposing second side within the central portion; and

a plurality of internal grooves on each of the first side and the opposing second side within a space of the adapter, the plurality of internal grooves configured to align the first fiber optic connector and the second fiber optic connector in the main body and also align an additional fiber optic connector side-by-side with the first fiber optic connector without any internal walls therebetween to an additional fiber optic connector side-by-side with the second fiber optic connector without any internal walls therebetween within the width of the adapter.

19. (Original) The adapter of claim 18, wherein the plurality of internal grooves are sized to receive a respective projection on each of the first fiber optic connector and the second fiber optic connector for alignment.

20. (Original) The adapter of claim 18, wherein the plurality of internal grooves extend longitudinally in a direction toward the central portion.

21. (Previously Presented) An adapter for optical fiber communications, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side into the main body, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located longitudinally inward from the first side,

at least two channels on the first side, each of the at least two channels configured to respectively receive one of at least two fiber optic connectors from the first side for an optical connection within the central portion,

a first internal groove of the first top wall extending toward the central portion; and

a second internal groove of the first bottom wall extending toward the central portion, the second internal groove being on a same side of the opening as the first internal groove,

wherein the first internal groove has a first width and the second internal groove has a second

width, the first width is greater than the second width, wherein the adapter is free of internal walls between the at least two channels on the first side.

REMARKS

In the above-referenced Office Action, the Examiner rejected claims 10 -14 under 35 U.S.C. 112(b) and rejected claims 1-21 on the ground of non-statutory double patenting as being unpatentable over claims 1-17 of U.S. Patent No. 10,890,723 and claims 1-21 on the ground of non-statutory double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 10,156,684.

Applicant has amended claim 10 as suggested by the Examiner. Applicant has also filed a terminal disclaimer to obviate the double patenting rejections. Thus, the case is allowable.

Respectfully submitted,

/Michael L. Leetzow/
Michael L. Leetzow PLLC
Registration No. 35,932
1205 S Keswick Dr.
Troy, VA 22974
Telephone: 407/302-9970

Date: January 15, 2024

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A PRIOR PATENT

APPLICATION #	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET #
17857300	07/05/2022	Hiep Nguyen	USCO-053-05

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

☑ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action

☑ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

Owner	Percent interest
US Conec Ltd.	100%
Total	100%

The owner(s) of percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending reference Application Number(s)

Application #	Filing Date

as the term of any patent granted on said reference application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending reference application. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the reference application are commonly owned. This agreement runs with any patent granted on the

instant application and is binding upon the grantee, its successors or assigns.
In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said reference application, "as the term of any patent granted on said reference application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending reference application," in the event that any such patent granted on the pending reference application: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

The owner(s) of percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s)

Patent #
10156684
10890723

as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.
In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:
- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.



Terminal disclaimer fee under 37 CFR 1.20(d) included with Electronic Terminal Disclaimer request.

Applicant claims the following entity status:
Regular Undiscounted

I hereby declare that all statements made herein of my own knowledge are true and that all statemnts made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I certify, in accordance with 37 CFR 1.4(d)(4) that I am: An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application

Signature	Name	Registration #
/Michael L. Leetzow/	Michael Leetzow	35932

* Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner). Form PTO/SB/96 may be used for making this certification. See MPEP 324.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/857,300	01/15/2024 05:33:36 PM Z ET	USCO-053-05

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5557	FILED BY	Michael Leetzow
PATENT CENTER #	63953289	AUTHORIZED BY	-
CUSTOMER #	152017	FILING DATE	07/05/2022
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Hiep V. Nguyen

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 7852	E20241EH34209409	Michael Leetzow

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1814	STATUTORY DISCLAIMER, INCLUDING TERMINAL DISCLAIMER	170.00	1	170.00
			TOTAL AMOUNT:	$170.00

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 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

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

APPROVAL LETTER

APPLICATION #	FILING DATE	APPLICANT/PATENT UNDER REEXAMINATION
17/857,300	07/05/2022	Hiep Nguyen

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

Electronic terminal disclaimer filed on 01/15/2024

☑ Approved

This patent is subject to a Terminal Disclaimer

Approved / Disapproved by: Electronic Terminal Disclaimer automatically approved

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/857,300	**01/15/2024 05:33:36 PM Z ET**	**USCO-053-05**

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5557	FILED BY	Michael Leetzow
PATENT CENTER #	63953289	FILING DATE	07/05/2022
CUSTOMER #	152017	FIRST NAMED INVENTOR	Hiep V. Nguyen
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	-

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
petition-request.pdf	3	Terminal Disclaimer-Filed (Electronic)	49 KB
grantLetter.pdf	1	Terminal Disclaimer-Electronic-Approved	19 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
petition-request.pdf	EAD2B3D0B93D99C0085FF463655813B58F73722F06EEF1A7D633D1CE1662CA1BC738D2D5677A8B1D5A069A24B49D5032F3

	245D88CE067581BD122511CCF8402E
grantLetter.pdf	68C78971D5E84C9789C0B4A853D6F372EFBCF34F98BE1F826 65E16D653FF602C691B1F3530573BB798EC2B67B20D572CB97 BD11D0BB03782B68E707C1E99F0E3

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 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/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 17/857,300	Filing Date 07/05/2022	☐ 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 $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ 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	01/15/2024	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 5	Minus	*** 5	= 0		x $480 =	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		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ 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.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/VICTORIA JOHNSON/
*** 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.	

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.

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.
17/857,300	07/05/2022	Hiep V. Nguyen	USCO-053-05	5557

152017 7590 01/12/2024

US Conec Ltd.
1138 25th Street Southeast
Hickory, NC 28602

EXAMINER
ROJAS, OMAR R

ART UNIT	PAPER NUMBER
2874	

NOTIFICATION DATE	DELIVERY MODE
01/12/2024	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@usconec.com
eofficeaction@appcoll.com
michael@leetzow.com

Office Action Summary	Application No. 17/857,300	Applicant(s) Nguyen et al.	
	Examiner Omar R Rojas	Art Unit 2874	AIA (FITF) 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 December 26, 2023.

☐ 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) 1-21 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) 1-21 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 _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

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

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

Priority under 35 U.S.C. § 119

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

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

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

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

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

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

Attachment(s)

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

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

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

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 26, 2023 has been entered.

Response to Amendment

3. With regards to the amendment filed on December 26, 2023, all the requested changes to the claims have been entered. Applicant's constructive efforts to advance prosecution are appreciated. Claim(s) 1-21 are pending.

Response to Arguments

4. Applicant's arguments, see pages 8-9, filed December 26, 2023, with respect to previous claim rejections under 35 USC §102 have been fully considered and are persuasive. The rejection of claims 1-4 and 6-21 under 35 USC §102 has been withdrawn.

Claim Rejections - 35 USC § 112

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

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

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

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

6. Claims 10-14 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention. Claim 10 recites the newly added limitation "with space for at least two fiber optic ferrules on the first side without any internal walls therebetween". As seen in Fig. 6A of the application drawings, however, internal walls of connectors (300) are located between adjacent ferrules (12). Thus, the aforementioned limitation contradicts the disclosure and renders claim 10 indefinite because there are actually "internal walls" located between the fiber optic ferrules in view of Fig. 6A. This rejection may be overcome by changing the term "internal walls" to "internal walls of the adapter".

7. Claims 11-14 are rejected under this section as being dependent upon rejected claim 10.

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619

(CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

9. **Claims 1-21 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 10,156,684 (hereinafter "the '684 patent").** The '684 parent was applied in a prior Office action. Although the claims at issue are not identical, they are not patentably distinct from each other because both sets of claims are directed to the same underlying embodiment and the same disclosure. Claims 1-11 of the '684 patent only differ from pending claims 1-21 in that the patented claims do not recite all of the additional

aspects recited in pending claims 1-21. It would have been obvious to one of ordinary skill in the art before the effective filing date to modify the invention of claims 1-11 of the '684 patent to include additional unclaimed aspects from the underlying embodiment of the patented claims, thereby obtaining the invention specified by pending claims 1-21. Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date to obtain the invention specified by claims 1-21 in view of claims 1-11 of the '684 patent.

10. **Claims 1-21 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-17 of U.S. Patent No. 10,890,723 (hereinafter "the '723 patent").** The '723 parent was applied in a prior Office action. Although the claims at issue are not identical, they are not patentably distinct from each other because both sets of claims are directed to the same underlying embodiment and the same disclosure. Claims 1-17 of the '723 patent only differ from pending claims 1-21 in that the patented claims do not recite all of the additional aspects recited in pending claims 1-21. It would have been obvious to one of ordinary skill in the art before the effective filing date to modify the invention of claims 1-17 of the '723 patent to include additional unclaimed aspects from the underlying embodiment of the patented claims, thereby obtaining the invention specified by pending claims 1-21. Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date to obtain the invention specified by claims 1-21 in view of claims 1-17 of the '723 patent.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Omar R. Rojas whose telephone number is (571)272-2357. The examiner can normally be reached on Monday-Friday, 10AM-6PM EST.

Examiner interviews are available via telephone, in-person, and video conferencing using

a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas 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.

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.

/Omar R Rojas/
Primary Examiner
Art Unit 2874

or
January 8, 2024

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/857,300	Nguyen et al.
	Examiner	Art Unit
	Omar R Rojas	2874

CPC - Searched*		
Symbol	Date	Examiner
G02B6/3825,3831,3879	09/11/2023	/ORR/

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
Checked refs. for 17/145,864.	07/14/2023	/ORR/
G02B6/3825,3831,3879 limited by CPC query - PE2E Search History Printout.	09/11/2023	/ORR/
Updated above - See PE2E Search History Printout.	01/08/2024	/ORR/
Updated PE2E search from 17/145,864 - See Search History Printout .	01/08/2024	/ORR/

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/Omar R Rojas/ Primary Examiner, Art Unit 2874	

Senko Advanced Components v. US Conec Ltd
Senko EX1025-A
Page 112

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L32	92	4 AND 7	(US-PGPUB; USPAT; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/01/08 01:25 PM
L33	441	1 AND 2	(US-PGPUB; USPAT; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/01/08 01:28 PM
L34	289	2 AND 10	(US-PGPUB; USPAT; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/01/08 01:28 PM
L35	1072	10 AND (4 7)	(US-PGPUB; USPAT; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH,	OR	ON	ON	2024/01/08 01:29 PM

			CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1816	988	1803 AND 1804	(US-PGPUB; USPAT; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/01/08 01:36 PM
L1818	43	(Artificial Intelligence) More like doc: CN-202600189-U Text: (WO-2013179197-A1 OR CN-103257407-B OR CN-103257407-A OR CN-202421558-U OR CN-219799842-U OR US-8444327-B2 OR CN-101779344-B OR CN-101779344-A OR CN-220105344-U OR EP-2168214-A2 OR EP-2168214-B1 OR CN-116315823-A OR JP-2022513812-A OR DE-60100639-T2 OR CN-106887726-A OR EP-1710864-A3 OR CN-1845381-A OR EP-1033786-B1 OR CA-2300000-C OR EP-1033786-A2).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/01/08 01:38 PM
L1819	32	("5283848" | "5796896" | "5971625" | "6146023" | "6259856" | "6331079" | "6357928" | "6422760" | "6461053" | "6572276" | "8500470" | "8641293" | "8873921" | "8998505" | "9057845" | "9086546" | "9146351" | "9494744" | "9519114" | "9568689" | "20030063862" | "20040117981" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/01/08 01:38 PM

Senko Advanced Components v. US Conec Ltd
Senko EX1025-A
Page 115

		"20090226140" | "20110019962" | "20120177326" | "20130183004" | "20130209041" | "20130216188" | "20130301994" | "20140147081" | "20140331464" | "20140348468").pn. AND (PGPB | USPT | USOC).dbnm.					
L1820	1	(13/790599).APP.	(USPAT; USOCR)	OR	ON	ON	2024/01/08 01:38 PM
L1821	136	1758 AND 1806	(US-PGPUB; USPAT; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/01/08 01:38 PM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

Senko Advanced Components v. US Conec Ltd
Senko EX1025-A
Page 116

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/857,300	12/26/2023 02:51:51 PM Z ET	USCO-053-05

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5557	FILED BY	Michael Leetzow
PATENT CENTER #	63749650	AUTHORIZED BY	-
CUSTOMER #	152017	FILING DATE	07/05/2022
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Hiep V. Nguyen

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 1000	E2023BPE52316183	Michael Leetzow

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1251	EXTENSION FOR RESPONSE WITHIN FIRST MONTH	220.00	1	220.00
1801	REQUEST FOR CONTINUED EXAMINATION (RCE) - 1ST REQUEST (SEE 37 CFR 1.114)	1360.00	1	1360.00
			TOTAL AMOUNT:	$1,580.00

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 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/22 (12-22)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

Docket Number (Optional): USCO-053-05

Application Number: 17/857,300

Filed: 2022-07-05

For: Alignment Adapter and Alignment Design for a Connector Therefor

Art Unit: 2874

Examiner: Omar R ROJAS

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	Micro Entity Fee	
☑	One month (37 CFR 1.17(a)(1))	$220	$88	$44	$ 220
☐	Two months (37 CFR 1.17(a)(2))	$640	$256	$128	$
☐	Three months (37 CFR 1.17(a)(3))	$1,480	$592	$296	$
☐	Four months (37 CFR 1.17(a)(4))	$2,320	$928	$464	$
☐	Five months (37 CFR 1.17(a)(5))	$3,160	$1,264	$632	$

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☐ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number _____.

☑ Payment made via USPTO's patent electronic filing system (Patent Center or EFS-Web).

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant.

☒ attorney or agent of record. Registration number 35932.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

/Michael L. Leetzow/ — Signature

2023-12-26 — Date

Michael L. Leetzow — Typed or printed name

407 302 9970 — Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☐ * Total of _____ forms are submitted.

A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995, unless the information collection has a currently valid OMB Control Number. The OMB Control Number for this information collection is 0651-0031. Public burden for this form is estimated to average 6 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the Chief Administrative Officer, United States Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 or email InformationCollection@uspto.gov. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS.** If filing this completed form by mail, 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.

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. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013). https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf

Routine uses of the information in this record may include disclosure to: 1) law enforcement, in the event that the system of records indicates a violation or potential violation of law; 2) a Federal, state, local, or international agency, in response to its request; 3) a contractor of the USPTO having need for the information in order to perform a contract; 4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record; 5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record; 6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations; 7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals; 8) 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)); 9) the Office of Personnel Management (OPM) for personnel research purposes; and 9) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

Additional Uses

Additional USPTO uses of the information in this record may include disclosure to: 1) the International Bureau of the World Intellectual Property Organization, if the record is related to an international application filed under the Patent Cooperation Treaty; 2) the public i) after publication of the application pursuant to 35 U.S.C. 122(b), ii) after issuance of a patent pursuant to 35 U.S.C. 151, iii) 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, or iv) without publication of the application or patent under the specific circumstances provided for by 37 CFR 1.14(a)(1)(v)-(vii); and/or 3) the National Archives and Records Administration, for inspection of records.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/857,300	**12/26/2023 02:51:51 PM Z ET**	**USCO-053-05**

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5557	FILED BY	Michael Leetzow
PATENT CENTER #	63749650	FILING DATE	07/05/2022
CUSTOMER #	152017	FIRST NAMED INVENTOR	Hiep V. Nguyen
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	-

Documents

TOTAL DOCUMENTS: 3

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
USCO-053-05_USPTO_AIA22_20231226_141408.pdf	2	Extension of Time	244 KB
AmendUSCO5305Dec2023.pdf	11	Amendment Submitted/Entered with Filing of Continued Prosecution Application (CPA)/Request for Continued Examination(RCE)	482 KB
USCO-053-05_USPTO_SB30PC_20231226_141057.pdf	3	Request for Continued Examination (RCE)	1642 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
USCO-053-05_USPTO_AIA22_20231226_141408.pdf	F1B2FB36C1AFA6523DE0AFF63A68023B67C197203A510FAC450F27A3A8709C2989AE8AC71FDA8C420BF41DBA15105AEBCB346F503E3762D99C6BF99CED55F40B
AmendUSCO5305Dec2023.pdf	A857F42674E9D84FE068A5664721807EC31F41C11C89475AA9401DDC7F840461ADDE912864A1535FC99CFE31B37DF3744A8C3726EBDA85AFCCD5334A7CB783D5
USCO-053-05_USPTO_SB30PC_20231226_141057.pdf	42DE9A6FCA9FB9662D4BC2255EB56C6A5A0C8811FCBC2B3826042FA81842BABFEC07EB904D1B83C207EC5792CF7A6E22A458670FC6CF8CAD64F1A15FDCE8F625

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 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/SB/30EFS (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	17/857,300	Filing Date	2022-07-05	Docket Number (if applicable)	USCO-053-05	Art Unit	2874
First Named Inventor	Hiep V. Nguyen			Examiner Name	Omar R ROJAS		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☒ Other Fees

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☐ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No _____

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Michael L. Leetzow/	Date (YYYY-MM-DD)	2023-12-26
Name	Michael L. Leetzow	Registration Number	35932

This collection of information is required by 37 CFR 1.114. 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 1.11 and 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.

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

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Hiep V. Nguyen	)	
		)	Group Art Unit: 2874
Serial No.:	17/857,300	)	
		)	Examiner: Rojas, Omar R.
Filing Date:	July 5, 2022	)	
		)	
Title:	Alignment Adapter and Alignment Design for a Connector Therefor	)	

Commissioner for Patents
PO Box 1450
Arlington VA 22313-1450

AMENDMENT WITH REQUEST FOR CONTINUED EXAMINATION

In response to the final Office Action mailed on September 19, 2023, and the Advisory Action on December 8, 2023, Applicant amends the application as follows:

IN THE CLAIMS:

1. (Currently Amended) An adapter for holding fiber optic connectors, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located between the first side and the opposing second side, a first fiber optic connector from the first side mating with a second fiber optic connector from the opposing second side within the central portion,

a first internal groove of the first top wall extending from the first side toward the central portion; and

a second internal groove of the first bottom wall also extending from the first side toward the central portion,

wherein the first internal groove has a first width and the second internal groove has a second width, the first width is greater than the second width, wherein the adapter is free of internal walls outwardly of the central portion in a space between the opposing side walls along the width and between the first top wall and the first bottom wall along the height, and wherein the main body includes at least two channels on the first side to respectively receive the first fiber optic connector and an additional fiber optic connector side-by-side with the first fiber optic connector without any internal walls therebetween, and wherein the main body includes at least two channels on the opposing second side to respectively receive the second fiber optic connector and another additional fiber optic connector side-by-side with the second fiber optic connector without any internal walls therebetween.

2. (Original) The adapter of claim 1, wherein the central portion includes a wall extending across the opening in the adapter.

3. (Original) The adapter of claim 2, wherein the wall divides the central portion in half.

4. (Original) The adapter of claim 2, wherein the wall has passageways sized to allow respective ferrules from the first fiber optic connector and the second fiber optic connector to engage.

5. (Original) The adapter of claim 1, wherein the first top wall has a dropped top portion and the first bottom wall has a raised bottom portion for mitigating electromagnetic interference (EMI).

6. (Original) The adapter of claim 1, wherein the first top wall and the first bottom wall have a smooth plane structure in the central portion.

7. (Original) The adapter of claim 6, further comprising a wall in the central portion extending across the opening in the adapter.

8. (Original) The adapter of claim 7, wherein the wall has passageways sized to allow respective ferrules from the first fiber optic connector and the second fiber optic connector to engage.

9. (Original) The adapter of claim 1, wherein the main body has a width to receive one fiber optic connector to four fiber optic connectors.

10. (Currently Amended) An adapter for aligning fiber optic ferrules inserted from opposing sides comprising:

a main body having an opening extending between a first side and a second side, the first side and the second side separated by a central portion; and

at least one groove in a top surface and at least one groove in a bottom surface of the main body extending longitudinally toward the central portion from each of the first side and the second side,

wherein the adapter is configured such that a first fiber optic ferrule is received at the first side and a second fiber optic ferrule is received at the second side of the adapter for alignment by the at least one groove at the top surface and the bottom surface of the main body, and wherein the adapter is configured to mate at least four fiber optic ferrules in pairs with space for at least two fiber optic ferrules on the first side without any internal walls therebetween and at least two fiber optic ferrules on the second side without any internal walls therebetween, including the first fiber optic ferrule and the second fiber optic ferrule.

11. (Original) The adapter of claim 10, wherein the at least one groove is sized differently on the top surface than on the bottom surface.

12. (Original) The adapter of claim 10, wherein the first fiber optic ferrule is disposed partially inside a first ferrule holder, and

wherein the at least one groove is sized to match a projection on an outside surface of the first ferrule holder for alignment.

13. (Original) The adapter of claim 10, wherein the central portion includes a wall extending across the opening in the adapter.

14. (Original) The adapter of claim 13, wherein the wall divides the central portion in half.

15. (Currently Amended) An adapter for aligning a first fiber optic connector having a first fiber optic ferrule inserted from a first side and a second fiber optic connector having a second fiber optic ferrule inserted from a second side, comprising:

a main body having an opening defined by two opposing side walls, a top surface and a bottom surface joining the two opposing side walls, the opening extending between the first side and the second side, the first side configured to receive the first fiber optic connector and the second side configured to receive the second fiber optic connector;

a central portion inside the main body located between the first side and the second side,

the first fiber optic connector and the second fiber optic connector mating in a region of the central portion; and

a first groove disposed on the top surface and a second groove disposed on the bottom surface on each of the first side and the second side, each of the first groove and the second groove extending toward the central portion from each of the first side and the second side,

wherein the first groove has a dimension different from the second groove, and wherein the main body includes at least two channels on the first side to respectively receive the first fiber optic connector and an additional fiber optic connector side-by-side with the first fiber optic connector without any internal walls therebetween, and wherein the main body includes at least two channels on the second side to respectively receive the second fiber optic connector and another additional fiber optic connector side-by-side with the second fiber optic connector without any internal walls therebetween.

16. (Original) The adapter of claim 15, wherein the first groove is wider than the second groove.

17. (Original) The adapter of claim 15, wherein the dimension of the first groove matches a dimension of a projection of the first fiber optic connector for alignment.

18. (Currently Amended) An adapter for holding fiber optic connectors, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located between the first side and the opposing second side, a first fiber optic connector from the first side mating with a second fiber optic connector from the opposing second side within the central portion; and

a plurality of internal grooves on each of the first side and the opposing second side within a space of the adapter, the plurality of internal grooves configured to align the first fiber optic connector and the second fiber optic connector in the main body and also align an additional fiber optic connector side-by-side with the first fiber optic connector without any internal walls therebetween to an additional fiber optic connector side-by-side with the second fiber optic connector without any internal walls therebetween within the width of the adapter.

19. (Original) The adapter of claim 18, wherein the plurality of internal grooves are sized to receive a respective projection on each of the first fiber optic connector and the second fiber optic connector for alignment.

20. (Original) The adapter of claim 18, wherein the plurality of internal grooves extend longitudinally in a direction toward the central portion.

21. (Currently Amended) An adapter for optical fiber communications, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side into the main body, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located longitudinally inward from the first side,

at least two channels on the first side, each of the at least two channels configured to respectively receive one of at least two fiber optic connectors from the first side for an optical connection within the central portion,

a first internal groove of the first top wall extending toward the central portion; and

a second internal groove of the first bottom wall extending toward the central portion, the second internal groove being on a same side of the opening as the first internal groove,

wherein the first internal groove has a first width and the second internal groove has a second

width, the first width is greater than the second width, wherein the adapter is free of internal walls between the at least two channels on the first side ~~outwardly of the central portion in a space between the opposing side walls along the width and between the first top wall and the first bottom wall along the height~~.

REMARKS

In the above-referenced Office Action, the Examiner rejected claims 10 and 12-14 under 35 U.S.C. 102(a)(1) as being anticipated by Patent No. 4,645,295 to Pronovost; rejected claims 1-4, 6-21 under 35 U.S.C. 102(e) as being anticipated by Patent No. WO2013/179197 to Grinderslev et al.; and rejected claim 11 under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Pronovost as applied to claim 10 above, and further in view of Patent Pub. No. US 2012/0057824 A1 to Katoh; rejected claims 1-21 on the ground of non-statutory double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 10,156,684; and rejected claims 1-21 on the ground of non-statutory double patenting as being unpatentable over claims 1-17 of U.S. Patent No. 10,890,723 and claims 1-21 on the ground of non-statutory double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 10,156,684.

With regard to the rejections on the grounds of non-statutory double patenting, Applicant will submit appropriate terminal disclaimers once the claims are in an otherwise allowable state due to the payment that must accompany the disclaimers.

Applicant has amended claims 1, 10, 15, 18, and 21. Thus claims 1-21 are still pending.

The Examiner rejected claims 10 and 12-14 under 35 U.S.C. 102(a)(1) as being anticipated by Patent No. 4,645,295 to Pronovost indicating that there is at least one groove in a bottom surface and that four successive pairs of fiber optic ferrules can be mated and generally referred Applicant to columns 3-6. Applicant was not able to find anything related to more than a single pair of fiber optic ferrules being mated from opposite sides. See Col. 4, ll. 1-5. However, to further prosecution, Applicant has amended claim 10 to explicitly require that the adapter has space for at least two fiber optic ferrules on the first side and at least two fiber optic ferrules on the second side. The adapter in Pronovost does not have that feature and has space to only accept one fiber optic ferrule on each side.

The Examiner also appears to interpret the claim language of the at least one groove in the bottom surface as being shown in Fig. 1. However, the claim requires that there be at least one groove in each of the top and bottom walls on both sides of the adapter. That means, as explained before, that there are at least four grooves. Applicant has annotated Fig. 1 to show where the at least one groove 62 in the top surface is missing:

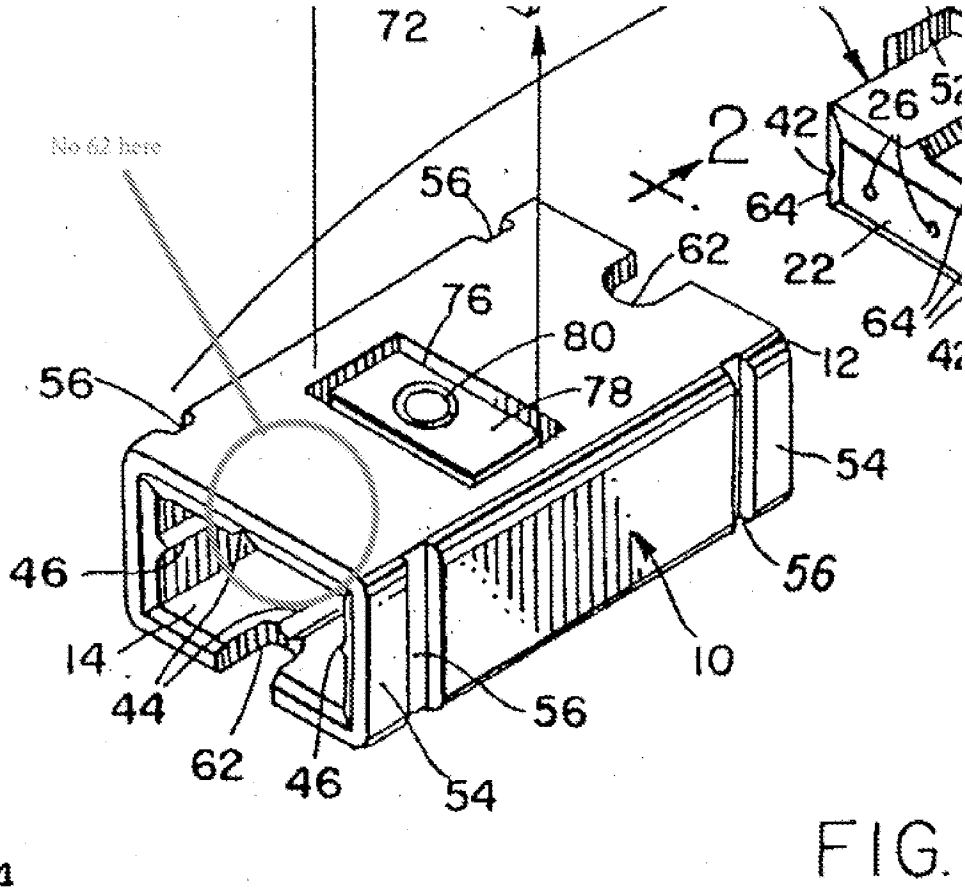


FIG.

Applicant further asserts that the fourth groove below the element 62 on the top right surface is also missing. Cf. Fig. 3 that shows in cross section that there are only two elements 62. For this additional reason, claims 10 and 11-14 are allowable. Claim 21 has similar limitations and is allowable for at least the same reasons.

Next the Examiner rejected claims 1-4, 6-21 under 35 U.S.C. 102(e) as being anticipated by Grinderslev et al. Applicant has amended claim 1 to require that the main body includes at least two channels on the first side to respectively receive the first fiber optic connector and an additional fiber optic connector side-by-side with the first fiber optic connector without any internal walls therebetween. The Examiner has pointed to reference numeral 2 or a sub-space thereof between the opposing outside walls 11,12. Applicant has amended claims 1, 15, 18, and

21 to require that the fiber optic connectors are next to one another in the opening without any walls between them. Clearly only one of the connectors can be disposed within each of the compartments A and B in Fig. 5. See:

Fig. 4

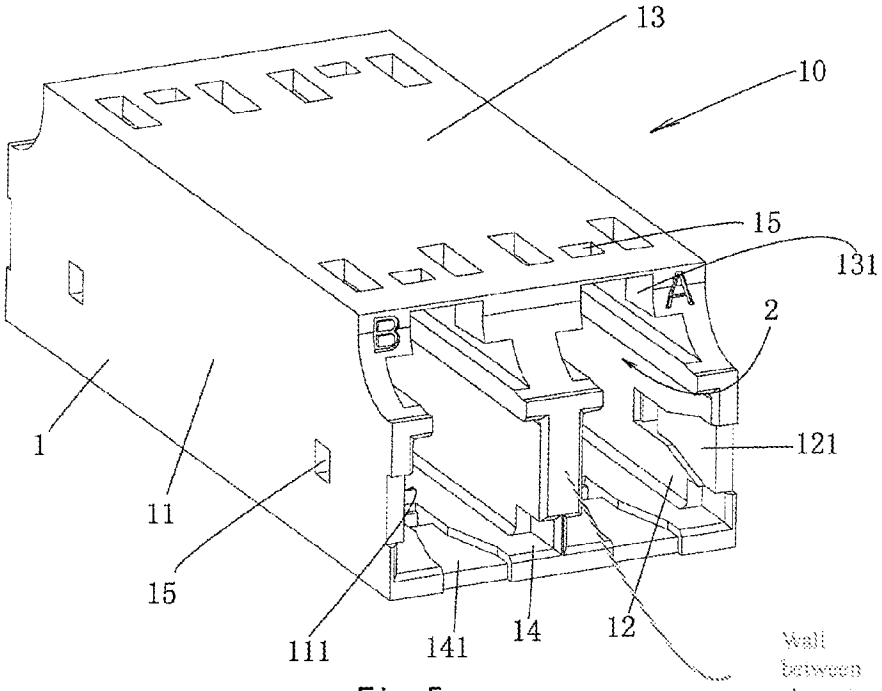


Fig. 5

With only one of the connectors in each of the two channels, there is a wall between the two connectors. For this reason alone, claims 1, 10, 15, 18, and 21 are allowable.

Claims 2-9, depending from claim 1, are allowable for at least the same reasons as claim 1. In fact, Applicant asserts that with all of the claims requiring at least two fiber optic connectors on each side and that there are no walls between the at least two fiber connectors, all of the claims are allowable as the references do not disclose or suggest these claim elements.

Applicant notes that claim 5 was not addressed except as being rejected on the ground of non-statutory double patenting. Thus, claim 5 will be allowable upon the filing of a terminal disclaimer.

With the same amendments to claims 15, and 18, these claims and their dependent claims are allowable for at least the same reasons as claim 1.

Finally, the Examiner rejected claim 11 as being unpatentable over Pronovost as applied to claim 10 above, and further in view of Katoh. Katoh was cited for having keys with different sizes. However, Katoh does not cure the deficiencies of Pronovost noted above for claim 10. Thus, claim 11 is also allowable.

Respectfully submitted,

/Michael L. Leetzow/
Michael L. Leetzow PLLC
Registration No. 35,932
1205 S Keswick Dr.
Troy, VA 22974
Telephone: 407/302-9970

Date: December 26, 2023

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 17/857,300	Filing Date 07/05/2022	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) 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 $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ 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	12/26/2023	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 5	Minus	*** 5	= 0		x $480 =	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		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ 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.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/DEBORAH D SCOTT/
*** 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.	

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.

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.
17/857,300	07/05/2022	Hiep V. Nguyen	USCO-053-05	5557

152017 7590 12/08/2023

US Conec Ltd.
1138 25th Street Southeast
Hickory, NC 28602

EXAMINER
ROJAS, OMAR R

ART UNIT	PAPER NUMBER
2874	

NOTIFICATION DATE	DELIVERY MODE
12/08/2023	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@usconec.com
eofficeaction@appcoll.com
michael@leetzow.com

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 17/857,300	**Applicant(s)** Nguyen et al.	
	Examiner Omar R Rojas	**Art Unit** 2874	**AIA (FITF) Status** No

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

THE REPLY FILED 28 November 2023 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

NO NOTICE OF APPEAL FILED

1. ☑ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:
   a) ☐ The period for reply expires ____ months from the mailing date of the final rejection.
   b) ☑ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
   c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection.The current period for reply expires ____ months from the mailing date of *the prior Advisory Action* or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.
   Examiner Note: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANTS FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37CFR 41.37(a).

AMENDMENTS

3. ☑ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   a) ☑ They raise new issues that would require further consideration and/or search (see NOTE below);
   b) ☐ They raise the issue of new matter (see NOTE below);
   c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.
   NOTE: See Continuation Sheet (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☑ For purposes of appeal, the proposed amendment(s):(a) ☑ will not be entered, or (b) ☐ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____
9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
11. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

12. ☐ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: _____.
13. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
14. ☑ Other: PTOL-2323.

STATUS OF CLAIMS

15. The status of the claim(s) is (or will be) as follows:
    Claim(s) allowed:_____.
    Claim(s) objected to:_____.
    Claim(s) rejected:1-21.
    Claim(s) withdrawn from consideration:_____.

/Omar R Rojas/ Primary Examiner, Art Unit 2874	

Continuation of 3. NOTE: Applicant's AFCP 2.0 request in the response filed 11/28/2023 is acknowledged and appreciated. While applicant has addressed claim 10 with respect to the Pronovost reference, applicant has NOT explained how the proposed amendment to claim 10 would overcome the Grinderslev reference which was also applied to claim 10. Furthermore, contrary to applicant's remarks on pages 9-10 of the response, claim 21 has NOT been amended and, therefore, claim 21 is still considered to be anticipated by Grinderslev. Lastly,consideration of the proposed amendment filed 11/28/2023 is further complicated because the proposed changes to claims 1 and 10 differ substantially in scope. For the aforementioned reasons, the proposed amendments filed 11/28/2023 raise new issues that would require additional search and consideration beyond the scope of AFCP 2.0.

AFCP 2.0 Decision	Application No.	Applicant(s)	
	17/857,300	Nguyen et al.	
	Examiner	Art Unit	AIA (FITF) Status
	Omar R Rojas	2874	No

This is in response to the After Final Consideration Pilot request filed 28 November 2023.

1. **Improper Request** – The AFCP 2.0 request is improper for the following reason(s) and the after final amendment submitted with the request will be treated under pre-pilot procedure.

   ☐ An AFCP 2.0 request form PTO/SB/434 (or equivalent document) was not submitted.

   ☐ A non-broadening amendment to at least one independent claim was not submitted.

   ☐ The request is not the first proper AFCP 2.0 request submitted in response to the most recent final rejection.

   ☐ Other: _____

2. **Proper Request**

   A. After final amendment submitted with the request will not be treated under AFCP 2.0.
   The after final amendment cannot be reviewed and a search conducted within the guidelines of the pilot program.

   ☑ The after final amendment will be treated under pre-pilot procedure.

   B. Updated search and/or completed additional consideration.
   The examiner performed an updated search and/or completed additional consideration of the after final amendment within the time authorized for the pilot program. The result(s) of the updated search and/or completed additional consideration are:

   ☐ 1. All of the rejections in the most recent final Office action are overcome and a Notice of Allowance is issued herewith.

   ☐ 2. The after final amendment would not overcome all of the rejections in the most recent final Office action . See attached interview summary for further details.

   ☐ 3. The after final amendment was reviewed, and it raises a new issue(s). See attached interview summary for further details.

   ☐ 4. The after final amendment raises new issues, but would overcome all of the rejections in the most recent final Office action. A decision on determining allowability could not be made within the guidelines of the pilot. See attached interview summary for further details, including any newly discovered prior art.

   ☐ 5. Other: _____

   Examiner Note: Please attach an interview summary when necessary as described above.

12/04/2023

DO NOT ENTER: /ORR/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Hiep V. Nguyen	)	
		)	Group Art Unit: 2874
Serial No.:	17/857,300	)	
		)	Examiner: Rojas, Omar R.
Filing Date:	July 5, 2022	)	
		)	
Title:	Alignment Adapter and Alignment Design for a Connector Therefor	)	

Commissioner for Patents
PO Box 1450
Arlington VA 22313-1450

AMENDMENT WITH AFTER FINAL CONSIDERATION REQUEST

In response to the final Office Action mailed on September 19, 2023, Applicant proposes to amend the application as follows:

Doc Code: A.NE.AFCP
Document Description: After Final Consideration Program Request

PTO/SB/434 (3-22)

CERTIFICATION AND REQUEST FOR CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0

Practitioner Docket No.:	Application No.:	Filing Date:
USCO-053-05	17/857,300	2022-07-05
First Named Inventor:	**Title:**	
Hiep V. Nguyen	Alignment Adapter and Alignment Design for a Connector Therefor	

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0 (AFCP 2.0) OF THE ACCOMPANYING RESPONSE UNDER 37 CFR 1.116.

1. The above-identified application is (i) an original utility, plant, or design nonprovisional application filed under 35 U.S.C. 111(a) [a continuing application (*e.g.*, a continuation or divisional application) is filed under 35 U.S.C. 111(a) and is eligible under (i)], or (ii) an international application that has entered the national stage in compliance with 35 U.S.C. 371(c).
2. The above-identified application contains an outstanding final rejection.
3. Submitted herewith is a response under 37 CFR 1.116 to the outstanding final rejection. The response includes an amendment to at least one independent claim, and the amendment does not broaden the scope of the independent claim in any aspect.
4. This certification and request for consideration under AFCP 2.0 is the only AFCP 2.0 certification and request filed in response to the outstanding final rejection.
5. Applicant is willing and available to participate in any interview requested by the examiner concerning the present response.
6. This certification and request is being filed electronically using the USPTO's patent electronic filing system.
7. Any fees that would be necessary consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, extension of time fees, are being concurrently filed herewith. [There is no additional fee required to request consideration under AFCP 2.0.]
8. By filing this certification and request, applicant acknowledges the following:
    - Reissue applications and reexamination proceedings are not eligible to participate in AFCP 2.0.
    - The examiner will verify that the AFCP 2.0 submission is compliant, *i.e.*, that the requirements of the program have been met (see items 1 to 7 above). For compliant submissions:
        - The examiner will review the response under 37 CFR 1.116 to determine if additional search and/or consideration (i) is necessitated by the amendment and (ii) could be completed within the time allotted under AFCP 2.0. If additional search and/or consideration is required but cannot be completed within the allotted time, the examiner will process the submission consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, by mailing an advisory action.
        - If the examiner determines that the amendment does not necessitate additional search and/or consideration, or if the examiner determines that additional search and/or consideration is required and could be completed within the allotted time, then the examiner will consider whether the amendment places the application in condition for allowance (after completing the additional search and/or consideration, if required). If the examiner determines that the amendment does not place the application in condition for allowance, then the examiner will contact the applicant and request an interview.
            - The interview will be conducted by the examiner, and if the examiner does not have negotiation authority, a primary examiner and/or supervisory patent examiner will also participate.
            - If the applicant declines the interview, or if the interview cannot be scheduled within ten (10) calendar days from the date that the examiner first contacts the applicant, then the examiner will proceed consistent with current practice concerning responses after final rejection under 37 CFR 1.116.

Signature	Date	Practitioner Registration No.
/Michael L. Leetzow/	2023-11-28	35932
Name (Print/Typed)	**Telephone Number**	
Michael L. Leetzow	4073029970	

***Note**: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.*

☐ * Total of _____ forms are submitted.

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.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/857,300	**11/28/2023 02:39:23 PM Z ET**	**USCO-053-05**

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5557	FILED BY	Michael Leetzow
PATENT CENTER #	63402876	FILING DATE	07/05/2022
CUSTOMER #	152017	FIRST NAMED INVENTOR	Hiep V. Nguyen
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	-

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
USCO-053-05_USPTO_SB434_20231128_142753.pdf	2	After Final Consideration Program Request	258 KB
AFCPPAmendment.pdf	11	Response After Final Action	481 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
USCO-053-05_USPTO_SB434_20231128_	9240FAE7A2461BBCAAAE66F6F3FDF95C5AE1E8904861EC7223EA5756F9F7B30D4CC0FAFD292D1AB899BF874601B5C52AB

142753.pdf	CF41FEF589E5E7C522BA0C937A5F3AD
AFCPPAmendment.pdf	972E293F4AC2BBEC9A5CB864D282F2E6C6F1F0F43A4E3EF8 B119E8F276A40226059AE840209FECE3D956E1F0E7AA458D01 EF904A29BACB93C832A224F102B7C7

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 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Hiep V. Nguyen	)	
		)	Group Art Unit: 2874
Serial No.:	17/857,300	)	
		)	Examiner: Rojas, Omar R.
Filing Date:	July 5, 2022	)	
		)	
Title:	Alignment Adapter and Alignment Design for a Connector Therefor	)	

Commissioner for Patents
PO Box 1450
Arlington VA 22313-1450

AMENDMENT WITH AFTER FINAL CONSIDERATION REQUEST

In response to the final Office Action mailed on September 19, 2023, Applicant proposes to amend the application as follows:

IN THE CLAIMS:

1. (Currently Amended) An adapter for holding fiber optic connectors, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located between the first side and the opposing second side, a first fiber optic connector from the first side mating with a second fiber optic connector from the opposing second side within the central portion,

a first internal groove of the first top wall extending from the first side toward the central portion; and

a second internal groove of the first bottom wall also extending from the first side toward the central portion,

wherein the first internal groove has a first width and the second internal groove has a second width, the first width is greater than the second width, wherein the adapter is free of internal walls outwardly of the central portion in a space between the opposing side walls along the width and between the first top wall and the first bottom wall along the height, and wherein the main body includes at least two channels on the first side to respectively receive the first fiber optic connector and an additional fiber optic connector side-by-side with the first fiber optic connector without any internal walls therebetween, and wherein the main body includes at least two channels on the opposing second side to respectively receive the second fiber optic connector and another additional fiber optic connector side-by-side with the second fiber optic connector without any internal walls therebetween.

2. (Original) The adapter of claim 1, wherein the central portion includes a wall extending across the opening in the adapter.

3. (Original) The adapter of claim 2, wherein the wall divides the central portion in half.

4. (Original) The adapter of claim 2, wherein the wall has passageways sized to allow respective ferrules from the first fiber optic connector and the second fiber optic connector to engage.

5. (Original) The adapter of claim 1, wherein the first top wall has a dropped top portion and the first bottom wall has a raised bottom portion for mitigating electromagnetic interference (EMI).

6. (Original) The adapter of claim 1, wherein the first top wall and the first bottom wall have a smooth plane structure in the central portion.

7. (Original) The adapter of claim 6, further comprising a wall in the central portion extending across the opening in the adapter.

8. (Original) The adapter of claim 7, wherein the wall has passageways sized to allow respective ferrules from the first fiber optic connector and the second fiber optic connector to engage.

9. (Original) The adapter of claim 1, wherein the main body has a width to receive one fiber optic connector to four fiber optic connectors.

10. (Currently Amended) An adapter for aligning fiber optic ferrules inserted from opposing sides comprising:

a main body having an opening extending between a first side and a second side, the first side and the second side separated by a central portion; and

at least one groove in a top surface and at least one groove in a bottom surface of the main body extending longitudinally toward the central portion from each of the first side and the second side,

wherein the adapter is configured such that a first fiber optic ferrule is received at the first side and a second fiber optic ferrule is received at the second side of the adapter for alignment by the at least one groove at the top surface and the bottom surface of the main body, and wherein the adapter is configured to mate at least four fiber optic ferrules in pairs with space for at least two fiber optic ferrules on the first side and at least two fiber optic ferrules on the second side, including the first fiber optic ferrule and the second fiber optic ferrule.

11. (Original) The adapter of claim 10, wherein the at least one groove is sized differently on the top surface than on the bottom surface.

12. (Original) The adapter of claim 10, wherein the first fiber optic ferrule is disposed partially inside a first ferrule holder, and

wherein the at least one groove is sized to match a projection on an outside surface of the first ferrule holder for alignment.

13. (Original) The adapter of claim 10, wherein the central portion includes a wall extending across the opening in the adapter.

14. (Original) The adapter of claim 13, wherein the wall divides the central portion in half.

15. (Currently Amended) An adapter for aligning a first fiber optic connector having a first fiber optic ferrule inserted from a first side and a second fiber optic connector having a second fiber optic ferrule inserted from a second side, comprising:

a main body having an opening defined by two opposing side walls, a top surface and a bottom surface joining the two opposing side walls, the opening extending between the first side and the second side, the first side configured to receive the first fiber optic connector and the second side configured to receive the second fiber optic connector;

a central portion inside the main body located between the first side and the second side, the first fiber optic connector and the second fiber optic connector mating in a region of the

central portion; and

a first groove disposed on the top surface and a second groove disposed on the bottom surface on each of the first side and the second side, each of the first groove and the second groove extending toward the central portion from each of the first side and the second side,

wherein the first groove has a dimension different from the second groove, and wherein the main body includes at least two channels on the first side to respectively receive the first fiber optic connector and an additional fiber optic connector side-by-side with the first fiber optic connector without any internal walls therebetween, and wherein the main body includes at least two channels on the second side to respectively receive the second fiber optic connector and another additional fiber optic connector side-by-side with the second fiber optic connector without any internal walls therebetween.

16. (Original) The adapter of claim 15, wherein the first groove is wider than the second groove.

17. (Original) The adapter of claim 15, wherein the dimension of the first groove matches a dimension of a projection of the first fiber optic connector for alignment.

18. (Currently Amended) An adapter for holding fiber optic connectors, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located between the first side and the opposing second side, a first fiber optic connector from the first side mating with a second fiber optic connector from the opposing second side within the central portion; and

a plurality of internal grooves on each of the first side and the opposing second side within a space of the adapter, the plurality of internal grooves configured to align the first fiber optic connector and the second fiber optic connector in the main body and also align an additional fiber optic connector side-by-side with the first fiber optic connector without any internal walls therebetween to an additional fiber optic connector side-by-side with the second fiber optic connector without any internal walls therebetween within the width of the adapter.

19. (Original) The adapter of claim 18, wherein the plurality of internal grooves are sized to receive a respective projection on each of the first fiber optic connector and the second fiber optic connector for alignment.

20. (Original) The adapter of claim 18, wherein the plurality of internal grooves extend longitudinally in a direction toward the central portion.

21. (Previously Presented) An adapter for optical fiber communications, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side into the main body, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located longitudinally inward from the first side,

at least two channels on the first side, each of the at least two channels configured to respectively receive one of at least two fiber optic connectors from the first side for an optical connection within the central portion,

a first internal groove of the first top wall extending toward the central portion; and

a second internal groove of the first bottom wall extending toward the central portion, the second internal groove being on a same side of the opening as the first internal groove,

wherein the first internal groove has a first width and the second internal groove has a second width, the first width is greater than the second width, wherein the adapter is free of internal

walls outwardly of the central portion in a space between the opposing side walls along the width and between the first top wall and the first bottom wall along the height.

REMARKS

In the above-referenced Office Action, the Examiner rejected claims 10 and 12-14 under 35 U.S.C. 102(a)(1) as being anticipated by Patent No. 4,645,295 to Pronovost; rejected claims 1-4, 6-21 under 35 U.S.C. 102(e) as being anticipated by Patent No. WO2013/179197 to Grinderslev et al.; and rejected claim 11 under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Pronovost as applied to claim 10 above, and further in view of Patent Pub. No. US 2012/0057824 A1 to Katoh; rejected claims 1-21 on the ground of non-statutory double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 10,156,684; and rejected claims 1-21 on the ground of non-statutory double patenting as being unpatentable over claims 1-17 of U.S. Patent No. 10,890,723 and claims 1-21 on the ground of non-statutory double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 10,156,684.

With regard to the rejections on the grounds of non-statutory double patenting, Applicant will submit appropriate terminal disclaimers once the claims are in an otherwise allowable state due to the payment that must accompany the disclaimers.

Applicant has amended claims 1, 10, 15, and 18. Thus claims 1-21 are still pending.

The Examiner rejected claims 10 and 12-14 under 35 U.S.C. 102(a)(1) as being anticipated by Patent No. 4,645,295 to Pronovost indicating that there is at least one groove in a bottom surface and that four successive pairs of fiber optic ferrules can be mated and generally referred Applicant to columns 3-6. Applicant was not able to find anything related to more than one pair of fiber optic ferrules being mated from opposite sides. See Col. 4, ll. 1-5. However, to further prosecution, Applicant has amended claim 10 to explicitly require that the adapter has space for at least two fiber optic ferrules on the first side and at least two fiber optic ferrules on the second side. The adapter in Pronovost does not have that feature and has space to only accept one fiber optic ferrule on each side.

The Examiner also appears to interpret the claim language of the at least one groove in the bottom surface as being shown in Fig. 1. However, the claim requires that there be at least one groove in each of the top and bottom walls on both sides of the adapter. That means, as explained before, that there are at least four grooves. Applicant has annotated Fig. 1 to show where the at least one groove 62 in the top surface is missing:

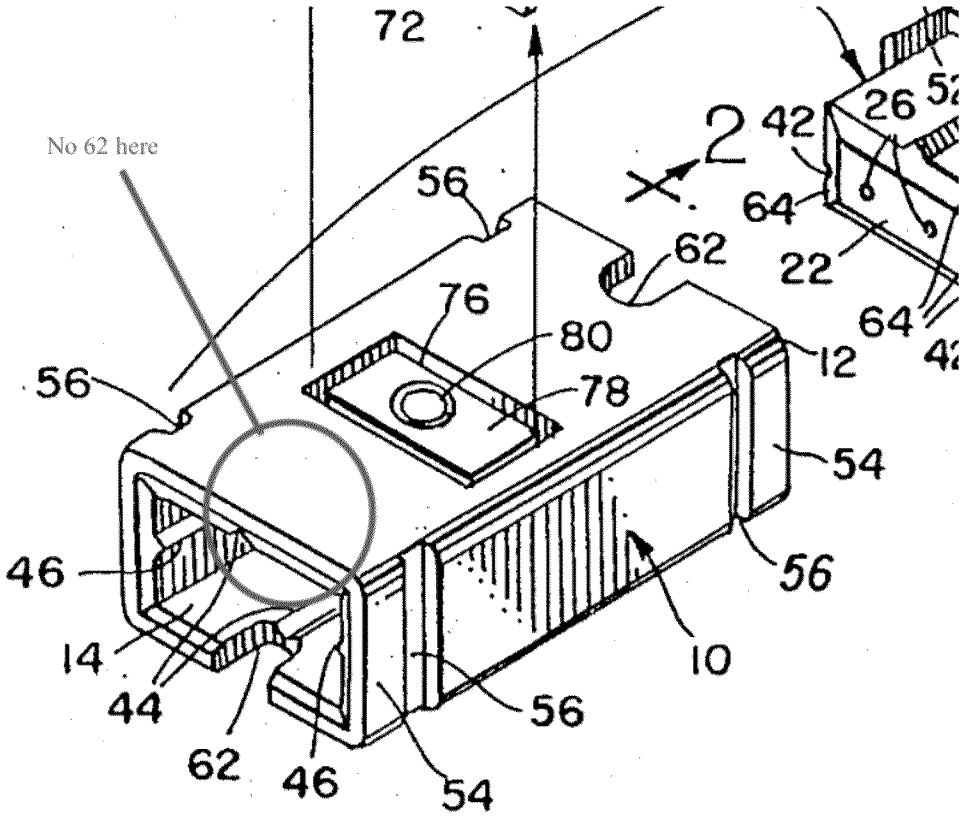


FIG.

Applicant further asserts that the fourth groove below the element 62 on the top right surface is also missing. Cf. Fig. 3 that shows in cross section that there are only two elements 62. For this additional reason, claims 10 and 11-14 are allowable. Claim 21 has similar limitations and is allowable for at least the same reasons.

Next the Examiner rejected claims 1-4, 6-21 under 35 U.S.C. 102(e) as being anticipated by Grinderslev et al. Applicant has amended claim 1 to require that the main body includes at least two channels on the first side to respectively receive the first fiber optic connector and an additional fiber optic connector side-by-side with the first fiber optic connector without any internal walls therebetween. The Examiner has pointed to reference numeral 2 or a sub-space thereof between the opposing outside walls 11,12. Applicant has amended claims 1, 15, 18, and

21 to require that the fiber optic connectors are next to one another in the opening without any walls between them. Clearly only one of the connectors can be disposed within each of the compartments A and B in Fig. 5. See:

Fig. 4

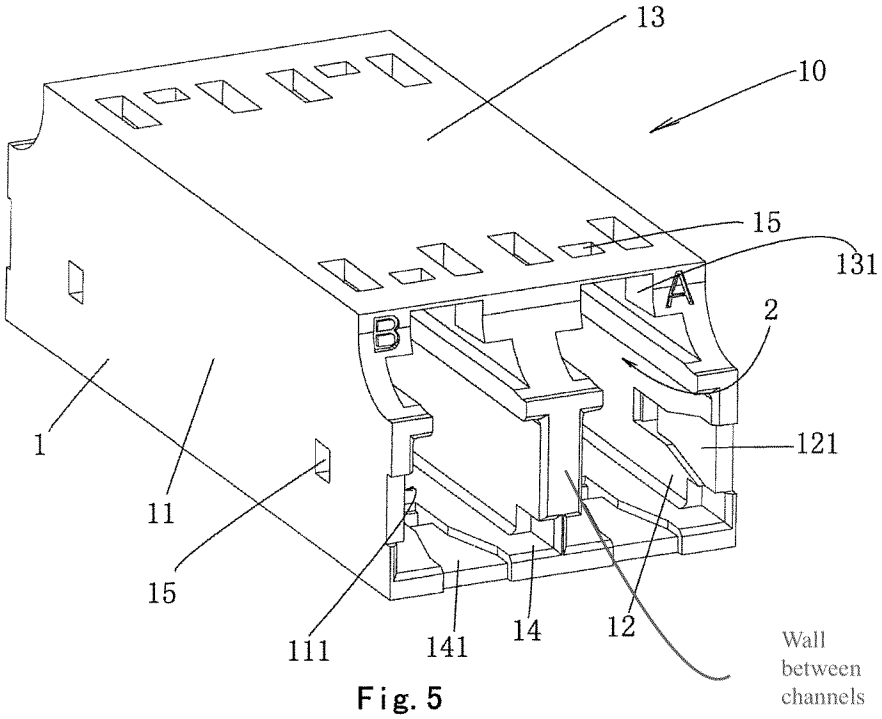


Fig. 5

With only one of the connectors in each of the two channels, there is a wall between the two connectors. For this reason alone, claim 1 is allowable.

Claims 2-9, depending from claim 1, are allowable for at least the same reasons as claim 1. Applicant notes that claim 5 was not addressed except as being rejected on the ground of non-statutory double patenting. Thus, claim 5 will be allowable upon the filing of a terminal disclaimer.

Applicant has made similar amendments to claims 15, and 18. They and their dependent claims are allowable for at least the same reasons as claim 1.

Finally, the Examiner rejected claim 11 as being unpatentable over Pronovost as applied to

claim 10 above, and further in view of Katoh. Katoh was cited for having keys with different sizes. However, Katoh does not cure the deficiencies of Pronovost noted above for claim 10. Thus, claim 11 is also allowable.

Applicant has submitted the form 434 to request consideration under the After Final Consideration Pilot Program 2.0. Applicant looks forward to a discussion with the Examiner about this amendment.

Respectfully submitted,

/Michael L. Leetzow/
Michael L. Leetzow PLLC
Registration No. 35,932
1205 S Keswick Dr.
Troy, VA 22974
Telephone: 407/302-9970

Date: November 28, 2023

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 17/857,300	Filing Date 07/05/2022	☐ 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 $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ 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	11/28/2023	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 5	Minus	*** 5	= 0		x $480 =	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		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ 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.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/RENEE D HAWKINS/
*** 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.	

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.

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.
17/857,300	07/05/2022	Hiep V. Nguyen	USCO-053-05	5557

152017 7590 09/19/2023

US Conec Ltd.
1138 25th Street Southeast
Hickory, NC 28602

EXAMINER
ROJAS, OMAR R

ART UNIT	PAPER NUMBER
2874	

NOTIFICATION DATE	DELIVERY MODE
09/19/2023	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@usconec.com
eofficeaction@appcoll.com
michael@leetzow.com

Office Action Summary	Application No. 17/857,300	Applicant(s) Nguyen et al.	
	Examiner Omar R Rojas	Art Unit 2874	AIA (FITF) 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 August 18, 2023.

☐ 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) 1-21 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) 1-21 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 _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

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

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

Priority under 35 U.S.C. § 119

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

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

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

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

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

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

Attachment(s)

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

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

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

4) ☑ Other: WO-2013179197-A1.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Response to Amendment

2. With regards to the amendment filed on August 18, 2023, all the requested changes to the claims have been entered. Applicant's constructive efforts to advance prosecution are appreciated. Claim(s) 1-21 are pending.

Response to Arguments

3. Applicant's arguments filed August 18, 2023 with respect to the Pronovost reference have been fully considered but they are not fully persuasive. In the examiner's opinion, Pronovost still reads upon amended claim 10 as indicated below.

4. Applicant's arguments with respect to claim(s) 1-4 and 6-21 have been considered but are moot because the new ground of rejection does not rely on any reference applied in the prior rejection of record for any teaching or matter specifically challenged in the argument.

Information Disclosure Statement

5. The prior art documents submitted by applicant(s) in the Information Disclosure Statement(s) ("IDS") filed on September 13, 2023 have all been considered and made of record (note the attached copy of form(s) PTO/SB/08a).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claim(s) 10 and 12-14 is/are rejected under 35 U.S.C. 102(b) as being anticipated by Patent No. 4,645,295 to Pronovost (hereinafter "Pronovost"). Pronovost was applied in a prior Office action.

In re claim 10, Pronovost discloses an adapter (10) for aligning fiber optic ferrules (16) inserted from opposing sides, see FIGS. 1-3, comprising:

a main body having an opening extending between a first side (12) and a second side (14), the first side (12) and the second side (14) separated by a central portion; and

at least one groove (62) in a top surface and at least one groove (62) in a bottom surface of the main body extending longitudinally toward the central portion from each of the first side (12) and the second side (14), wherein the adapter (10) is configured such that a first fiber optic ferrule is received at the first side (12) and a second fiber optic ferrule is received at the second side (14) of the adapter (10) for alignment by the at least one groove (62) at the top surface and the bottom surface of the main body, and wherein the adapter (10) is capable of mating at least four fiber optic ferrules (16) in successive pairs, including the first fiber optic ferrule (16) and the second fiber optic ferrule (16). *See* columns 3-6 of Pronovost for further details.

In re claim 12, the first fiber optic ferrule (16) is disposed partially inside a first ferrule holder comprising flaps (48), and wherein the at least one groove (62) is sized to match a projection on an outside surface of the first ferrule holder comprising flaps (48) for alignment.

In re claim 13, the central portion includes a wall (72) extending across the opening in the adapter (10).

In re claim 14, the wall (72) divides the central portion in half.

8. Claim(s) 1-4 and 6-21 is/are rejected under 35 U.S.C. 102(e) as being anticipated by WIPO Publication No. WO 2013/179197 A1 to Grinderslev et al. (hereinafter "Grinderslev").

In re claim 1, Grinderslev discloses an adapter (10), see Figs. 2-5, for holding fiber optic connectors (Fig. 20, 400), the adapter comprising:

a main body (10) having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls (11, 12) spaced apart along the width and a first top wall (13) and a first bottom wall (14) spaced apart along the height, each of the first top wall (13) and the first bottom wall (14) extending widthwise between the two opposing side walls (11, 12);

a central portion inside the main body (1) located between the first side and the opposing second side, a first fiber optic connector from the first side mating with a second fiber optic connector from the opposing second side within the central portion,

a first internal groove (131) of the first top wall (13) extending from the first side toward the central portion; and

a second internal groove (141) of the first bottom wall (14) also extending from the first side toward the central portion, wherein the first internal groove (131) has a first maximum width and the second internal groove (141) has a second minimum width, the first maximum width is

greater than the second minimum width, as seen in Fig. 5, wherein the adapter (10) is free of internal walls outwardly of the central portion in a space (interface 2 or a sub-space thereof) between the opposing side walls (11, 12) along the width and between the first top wall and the first bottom wall along the height, and wherein the main body includes at least two channels (2) on the first side to respectively receive the first fiber optic connector (400) and an additional fiber optic connector (400) side-by-side with the first fiber optic connector, and wherein the main body includes at least two channels (2) on the opposing second side to respectively receive the second fiber optic connector (400) and another additional fiber optic (400) connector side-by-side with the second fiber optic connector.

In re claims 2 and 3, as seen in Fig. 22 of Grindeslev, the central portion of the adapter (10) includes a wall at a corresponding portion (202) extending across the opening in the adapter (10) that divides the central portion in half.

In re claim 4, as seen in Fig. 22 of Grindeslev, the wall has corresponding passageways within portion (202) sized to allow respective ferrules (301) from the first fiber optic connector and the second fiber optic connector to engage.

In re claim 6, as seen in Fig. 5 of Grindeslev, the first top wall (13) and the first bottom wall (14) have a smooth plane structure in the central portion.

In re claims 7 and 8, as seen in Fig. 22 of Grindeslev, the central portion of the adapter (10) includes a wall at a corresponding portion (202) extending across the opening in the adapter (10)

with corresponding passageways within portion (202) sized to allow respective ferrules (301) from the first fiber optic connector (400) and the second fiber optic connector (400) to engage.

In re claim 9, the main body (1) has a width to receive one fiber optic connector (400) to four fiber optic connectors (400).

In re claim 10, Grinderslev discloses an adapter (10), see Figs. 2-5, for aligning fiber optic ferrules (Fig. 20, 301) inserted from opposing sides comprising:

a main body (1) having an opening comprising interfaces (2) extending between a first side and a second side, the first side and the second side separated by a central portion; and

at least one groove (131) in a top surface and at least one groove (141) in a bottom surface of the main body (1) extending longitudinally toward the central portion from each of the first side and the second side,

wherein the adapter (10) is configured such that a first fiber optic ferrule (301) is received at the first side and a second fiber optic ferrule (301) is received at the second side of the adapter (10) for alignment by the at least one groove at the top surface and the bottom surface of the main body (1), and wherein the adapter (10) is configured to mate at least four fiber optic ferrules (301) in pairs, including the first fiber optic ferrule (301) and the second fiber optic ferrule (301). *See* page 1 and pages 7-9 of Grinderslev for further details.

In re claim 11, as seen in Fig. 5 of Grinderslev, the at least one groove (131, 141) is sized differently on the top surface than on the bottom surface.

In re claim 12, as seen in Fig. 20 of Grinderslev, the first fiber optic ferrule (301) is disposed partially inside a first ferrule holder (401), and wherein the at least one groove (131) is sized to match a projection/latch on an outside surface of the first ferrule holder (401) for alignment.

In re claims 13 and 14, as seen in Fig. 22 of Grindeslev, the central portion of the adapter (10) includes a wall at a corresponding portion (202) extending across the opening in the adapter (10) that divides the central portion in half.

In re claim 15, Grinderslev discloses an adapter (10), see Figs. 2-5, for aligning a first fiber optic connector (Fig. 20, 400) having a first fiber optic ferrule (301) inserted from a first side and a second fiber optic connector (400) having a second fiber optic ferrule (301) inserted from a second side, comprising:

a main body (1) having an opening defined by two opposing side walls (11, 12), a top surface and a bottom surface joining the two opposing side walls (11, 12), the opening extending between the first side and the second side, the first side configured to receive the first fiber optic connector (400) and the second side configured to receive the second fiber optic connector (400);

a central portion inside the main body (1) located between the first side and the second side, the first fiber optic connector (400) and the second fiber optic connector (400) mating in a region of the central portion; and

a first groove (131) disposed on the top surface and a second groove (141) disposed on the bottom surface on each of the first side and the second side, each of the first groove (131) and the second groove (141) extending toward the central portion from each of the first side and the second side,

wherein the first groove (131) has a dimension different from the second groove (141), see Fig. 5, and wherein the main body (1) includes at least two channels (2) on the first side to respectively receive the first fiber optic connector (400) and an additional fiber optic connector (400) side-by-side with the first fiber optic connector (400), and

wherein the main body (1) includes at least two channels (2) on the second side to respectively receive the second fiber optic connector (400) and another additional fiber optic connector (400) side-by-side with the second fiber optic connector (400). *See* page 1 and pages 7-9 of Grinderslev for further details.

In re claim 16, as seen in Fig. 5 of Grinderslev, the first groove (131) has a maximum width wider than a minimum width of the second groove (141).

In re claim 17, the dimension of the first groove (131) matches a dimension of a projection/latch of the first fiber optic connector (400) for alignment.

In re claim 18, Grinderslev discloses an adapter (10), see Figs. 2-5, for holding fiber optic connectors (Fig. 20, 400), the adapter (10) comprising:

a main body (1) having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body (1) comprising two opposing side walls (11, 12) spaced apart along the width and a first top wall (13) and a first bottom wall (14) spaced apart along the height, each of the first top wall (13) and the first bottom wall (14) extending widthwise between the two opposing side walls (11, 12);

a central portion inside the main body (1) located between the first side and the opposing

second side, a first fiber optic connector (400) from the first side mating with a second fiber optic connector (400) from the opposing second side within the central portion; and

a plurality of internal grooves (131) on each of the first side and the opposing second side within a space of the adapter (10), the plurality of internal grooves (131) configured to align the first fiber optic connector (400) and the second fiber optic connector (400) in the main body (1) and also align an additional fiber optic connector (400) side-by-side with the first fiber optic connector (400) to an additional fiber optic connector (400) side-by-side with the second fiber optic connector (400) within the width of the adapter (10).

In re claim 19, the plurality of internal grooves (131) are sized to receive a respective projection/latch on each of the first fiber optic connector (400) and the second fiber optic connector (400) for alignment.

In re claim 20, as seen in Fig. 5 of Grinderslev, the plurality of internal grooves (131) extend longitudinally in a direction toward the central portion.

In re claim 21, Grinderslev discloses an adapter (10), see Figs. 2-5, for optical fiber communications, the adapter (10) comprising:

a main body (1) having a width and a height and an opening extending longitudinally from a first side into the main body (1), the main body (1) comprising two opposing side walls (11, 12) spaced apart along the width and a first top wall (13) and a first bottom wall (14) spaced apart along the height, each of the first top wall (13) and the first bottom wall (14) extending widthwise between the two opposing side walls (11, 12);

a central portion inside the main body (1) located longitudinally inward from the first side,

at least two channels (2) on the first side, each of the at least two channels (2) configured to respectively receive one of at least two fiber optic connectors (Fig. 20, 400) a fiber optic connector (400) from the first side for an optical connection within the central portion,

a first internal groove (131) of the first top wall (13) extending toward the central portion; and

a second internal groove (141) of the first bottom wall (14) extending toward the central portion, the second internal groove (141) being on a same side of the opening as the first internal groove (131), wherein the first internal groove (131) has a first maximum width and the second internal groove (141) has a second minimum width, the first maximum width is greater than the second minimum width, as seen in Fig. 5, wherein the adapter (10) is free of internal walls outwardly of the central portion in a space (interface 2 or a sub-space thereof) between the opposing side walls (11, 12) along the width and between the first top wall (13) and the first bottom wall (14) along the height.

Claim Rejections - 35 USC § 103

9. 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, 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.

10. This application currently names joint inventors. In considering patentability of the claims the examiner presumes that the subject matter of the various claims was commonly

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

11. Claim 11 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Pronovost as applied to claim 10 above, and further in view of Patent Pub. No. US 2012/0057824 A1 to KATOH ("Katoh"). Katoh was also applied in a prior Office action.

In re claim 11, Pronovost only differs in that he does not teach his at least one groove (62) is sized differently on the top surface than on the bottom surface. Katoh, on the other hand, teaches a connector (1) having keys (51, 52) that are sized differently on a top surface than on a bottom surface. In order to receive the connector (1) of Katoh, the at least one groove (62) of Pronovost would have been sized differently on the top surface than on the bottom surface, thereby obtaining the invention specified by claim 11. Therefore, it would have been obvious to one ordinary skill in the art before the effective filing date of the claimed invention to obtain the invention specified by claim 11 in view of Pronovost combined with Katoh.

Double Patenting

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either

anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

13. **Claims 1-21 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 10,156,684 (hereinafter "the '684 patent").**

The '684 parent was also cited by applicant(s) in the IDS. Although the claims at issue are not identical, they are not patentably distinct from each other because both sets of claims are directed to the same underlying embodiment and the same disclosure. Claims 1-11 of the '684 patent only differ from pending claims 1-21 in that the patented claims do not recite all of the additional aspects recited in pending claims 1-21. It would have been obvious to one of ordinary skill in the art before the effective filing date to modify the invention of claims 1-11 of the '684 patent to include additional unclaimed aspects from the underlying embodiment of the patented claims, thereby obtaining the invention specified by pending claims 1-21. Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date to obtain the invention specified by claims 1-21 in view of claims 1-11 of the '684 patent.

14. **Claims 1-21 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-17 of U.S. Patent No. 10,890,723 (hereinafter "the '723 patent").** Although the claims at issue are not identical, they are not patentably distinct from each other because both sets of claims are directed to the same underlying embodiment and the same disclosure. Claims 1-17 of the '723 patent only differ from pending claims 1-21 in that the patented claims do not recite all of the additional aspects recited in pending claims 1-21. It would have been obvious to one of ordinary skill in the art before the effective filing date to modify the invention of claims 1-17 of the '723 patent to include additional unclaimed aspects from the underlying embodiment of the patented claims, thereby obtaining the invention specified by pending claims 1-21. Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date to obtain the invention specified by claims 1-21 in view of claims 1-17 of the '723 patent.

15.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Omar R. Rojas whose telephone number is (571)272-2357. The examiner can normally be reached on Monday-Friday, 10AM-6PM EST.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas 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.

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.

/Omar R Rojas/
Primary Examiner
Art Unit 2874

or
September 13, 2023

Notice of References Cited	Application/Control No. 17/857,300	Applicant(s)/Patent Under Reexamination Nguyen et al.	
	Examiner Omar R Rojas	Art Unit 2874	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
	A					
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N	WO-2013179197-A1	12-2013	WO	GRINDERSLEV S	G02B6/3825
	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.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/857,300	Nguyen et al.
	Examiner	Art Unit
	Omar R Rojas	2874

CPC - Searched*		
Symbol	Date	Examiner
G02B6/3825,3831,3879	09/11/2023	/ORR/

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
Checked refs. for 17/145,864.	07/14/2023	/ORR/
G02B6/3825,3831,3879 limited by CPC query - PE2E Search History Printout.	09/11/2023	/ORR/

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/Omar R Rojas/ Primary Examiner, Art Unit 2874	

Senko Advanced Components v. US Conec Ltd
Senko EX1025-A
Page 176

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1801	7531	(G02B6/3825).CPC.	(US-PGPUB; USPAT; EPO; JPO; DERWENT)	OR	ON	ON	2023/09/11 05:20 PM
L1802	4043	G02B6/3831.cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/09/11 05:20 PM
L1803	1818	1801 AND 1802	(US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2023/09/11 05:21 PM
L1804	7636	(G02B6/3879).CPC.	(US-PGPUB; USPAT; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/09/11 05:21 PM
L1805	954	1803 AND 1804	(US-PGPUB; USPAT; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/09/11 05:21 PM
L1806	1322	1802 AND 1804	(US-PGPUB; USPAT; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO,	OR	ON	ON	2023/09/11 07:05 PM

Senko Advanced Components v. US Conec Ltd
Senko EX1025-A
Page 177

			MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L1807	126	1758 AND 1806	(US-PGPUB; USPAT; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/09/11 07:06 PM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

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

PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	17857300
Filing Date	2022-07-05
First Named Inventor	Hiep V. Nguyen
Art Unit	2874
Examiner Name	Omar R ROJAS
Attorney Docket Number	USCO-053-05

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
/ORR/	1	6764222	B1	2004-07-20	Szilagyi et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
/ORR/	1	20050135752	A1	2005-06-23	Kiani et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
/ORR/	1	2013100892	WO	A1	2013-07-04	Tsuzaki et al.		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

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

Receipt date: 09/13/2023

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	17857300
	Filing Date	2022-07-05
	First Named Inventor	Hiep V. Nguyen
	Art Unit	2874
	Examiner Name	Omar R ROJAS
	Attorney Docket Number	USCO-053-05

	1		☐

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

EXAMINER SIGNATURE

Examiner Signature	/Omar R Rojas/	Date Considered	09/13/2023

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

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

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
5 December 2013 (05.12.2013)

WIPO | PCT

(10) International Publication Number
WO 2013/179197 A1

(51) International Patent Classification:
H01R 9/24 (2006.01) *H01R 13/514* (2006.01)
G02B 6/00 (2006.01) *H01R 31/06* (2006.01)
H01R 13/506 (2006.01) *H01R 13/518* (2006.01)
H01R 13/508 (2006.01) *H01R 13/74* (2006.01)

(21) International Application Number:
PCT/IB2013/054312

(22) International Filing Date:
24 May 2013 (24.05.2013)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
201220254953.7 31 May 2012 (31.05.2012) CN

(71) Applicant: **TYCO ELECTRONICS (SHANGHAI) CO. LTD.** [CN/CN]; Level 1, No. 142 He Dan Road, Waigaoqiao Free Trade Zone, Shanghai 200233 (CN).

(71) Applicant *(for MG only)*: **TYCO ELECTRONICS UK LTD** [GB/GB]; Faraday Road, Dorcan, Swindon, Wiltshire SN3 5HH (GB).

(71) Applicant: **TYCO ELECTRONICS CORPORATION** [US/US]; 1050 Westlakes Drive, Berwyn, PA 19312 (US).

(72) Inventors: **XUE, Hawk**; c/o Tyco Electronics (Shanghai) Co. Ltd., Level 1, No. 142 He Dan Road, Waigaoqiao Free Trade Zone, Shanghai 200233 (CN). **LIU, Lily**; c/o Tyco Electronics (Shanghai) Co. Ltd., Level 1, No. 142 He Dan Road, Waigaoqiao Free Trade Zone, Shanghai 200233 (CN). **GRINDERSLEV, Soren**; 1554 Mackintosh Way, Hummelstown, PA 17036 (US). **TONG, Zhaoyang**; c/o Tyco Electronics (Shanghai) Co. Ltd., Level 1, No. 142 He Dan Road, Waigaoqiao Free Trade Zone, Shanghai 200233 (CN).

(74) Agents: **HEINZ-SCHAEFER, Marion** et al.; c/o Tyco Electronics UK Ltd, European Patent Department, Faraday Road, Dorcan, Swindon, Wiltshire SN3 5HH (GB).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,

[Continued on next page]

(54) Title: ADAPTER ASSEMBLY AND CONNECTOR ASSEMBLY

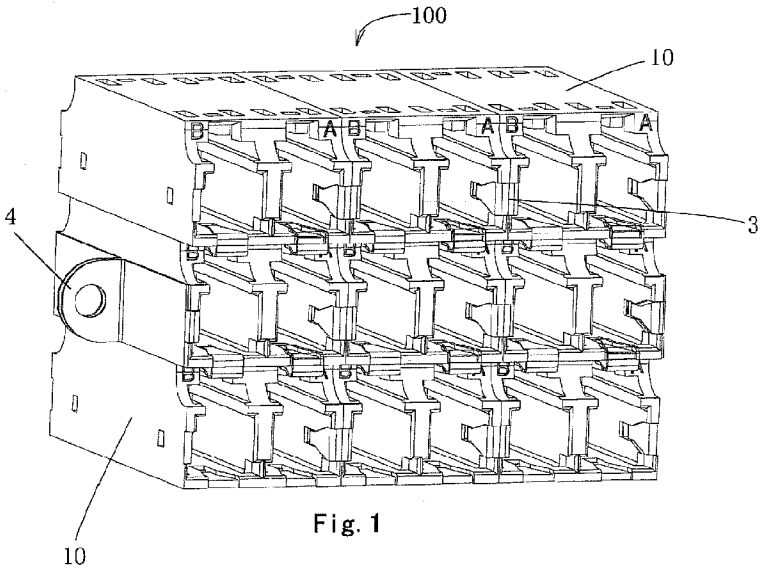


Fig. 1

(57) Abstract: An adapter assembly (100) for coupling with a plurality of connectors, comprising: a plurality of adapters (10) each including a housing, and at least one connection device (3). The housing is formed with at least one interfaces each for coupling with one of the connectors. Adjacent walls of the interfaces of two adjacent adapters of the plurality of adapters are connected with each other by the at least one connection device in a snap-fit manner, so that the plurality of adapters are connected together. The plurality of adapters are connected together in order in a manner of side by side in a horizontal direction and/or stacked in a vertical direction, so that the space above a mounting panel for mounting the plurality of adapters can be utilized optimally.

WO 2013/179197 A1

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 181

TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

ADAPTER ASSEMBLY AND CONNECTOR ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATION

This application claims the benefit of Chinese Patent Application No.201220254953.7 filed on May 31, 2012 in the State Intellectual Property Office of China, the whole disclosure of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to an adapter for a connector applied in a data communication and telecommunication field, more particularly, relates to an adapter for a plug connector, and relates to a connector assembly having the adapter.

Description of the Related Art

In various fiber communication systems, a fiber optic connector is generally used to couple fibers of different fiber optic cables.

Fig.20 is an illustrative perspective view of two conventional fiber optic connectors 400. Fig.21 and Fig.22 show a conventional adapter 200 used with the conventional fiber optic connector 400.

As shown in Figs.20-22, each of the fiber optic connector 400 comprises a connector body 401. A fiber optic cable 300 is inserted from an end of the connector body 401. A ferrule 301 for the fiber of the fiber optic cable 300 is exposed outside from the other end of the connector body 401. The adapter 200 comprises four interfaces 201 and two splicing portions 202. The four interfaces 201 are formed in both ends of the adapter 200 in pairs and configured to receiving the inserted connectors 400, respectively. Each of the splicing portions 202 is disposed between a pair of interfaces 201 for splicing the ferrules 301 of the fiber optic connectors 400 inserted into the pair of interfaces 201. When the fiber optic connector 400 is inserted into the adapter 200, the connector body 401 is received in the interface 201, and the fiber ferrule 301 is inserted into the splicing portion 202 to be spliced with another ferrule 301. Furthermore, the above adapter may be used to receive an electrical connector for electrically connecting two electrical cables in some cases.

As for the above conventional adapter for a plug connector, a flange feature may be formed on the adapter, and the adapter may be fixed on a mounting panel by an installation hole formed in the flange feature. Also, an elastic metal clamp may be provided on the adapter, and the adapter may be fixed on the mounting panel by the elastic metal clamp.

However, the adapters must be individually and respectively mounted on the mounting panel by the flange feature or the elastic metal clamp. If it needs to mount a plurality of adapters on the mounting panel, a certain distance must be kept between two adjacent adapters. Accordingly, the plurality of adapters cannot be arranged on the mounting panel in a high density, decreasing the space utilization efficiency of the mounting panel and wasting the installation space of the mounting panel.

SUMMARY OF THE INVENTION

The present invention has been made to overcome or alleviate at least one aspect of the above mentioned disadvantages.

An object of the present invention is to provide an adapter assembly and a connector assembly having the adapter assembly, in which a plurality of adapters are connected together in order in a manner of side by side in a horizontal direction and/or stacked in a vertical direction, so that the space above a mounting panel for mounting the plurality of adapters can be utilized optimally.

According to an aspect of the present invention, there is provided an adapter assembly for coupling with a plurality of connectors, comprising: a plurality of adapters each including a housing, and at least one connection device. The housing is formed with at least one interfaces each for coupling with one of the connectors. Adjacent walls of the interfaces of two adjacent adapters of the plurality of adapters are connected with each other by the at least one connection device in a snap-fit manner, so that the plurality of adapters are connected together.

In the above mentioned adapter assembly, the housing of each of the adapters exhibits a substantively cuboid shape and comprises a first vertical wall, a second vertical wall opposite to the first vertical wall, a top wall and a bottom wall for defining the interface; and the connection device is configured to connect the adjacent first and second vertical walls and/or the adjacent top and bottom walls of two adjacent adapters of the plurality of adapters.

In the above mentioned adapter assembly, the connection device is an elastic clamping member configured to clamp the adjacent first and second vertical walls and/or the adjacent top and bottom walls of two adjacent adapters of the plurality of adapters.

In the above mentioned adapter assembly, each of the first vertical wall, the second vertical wall, the top wall and the bottom wall is formed with a recess in an inner side thereof; and the clamping member comprises a pair of clamping arms each constructed to substantively match with that of the recess to be received in the respective recess.

In the above mentioned adapter assembly, each of the clamping members comprises a pair of holding portions protruding toward each other at free ends of the pair of clamping arms; and a distal end of each of the recesses is formed with a through hole running through

the first vertical wall, the second vertical wall, the top wall and the bottom wall for receiving the respective holding portion therein.

In the above mentioned adapter assembly, each of the clamping arms exhibits a substantively triangle shape.

In the above mentioned adapter assembly, the adapter assembly further comprises at least one pair of installation members. One of the pair of installation members is mounted on the first vertical wall or the second vertical wall at the outmost side of a row of adapters. Each of the installation members comprises a body having a first end and a second end opposite to the first end, and the length of the body from the first end to the second end being equal to about an half of a longitudinal length of the adapter; an installation lug perpendicularly extending from the first end of the body; and an auxiliary clamping component formed by bending inward from the second end of the body by about 180 degrees and engaged in the recess of the vertical wall at the outmost side of the row of adapters.

In the above mentioned adapter assembly, an installation hole is provided in the installation lug; and an elastic clamping protrusion is formed on a free end of the auxiliary clamping component.

In the above mentioned adapter assembly, each of the connection devices comprises: at least one first horizontal connection member formed by extending from an outer side of the first vertical wall in a horizontal direction; and at least one second horizontal connection member formed on an outer side of the second vertical wall. The first and second horizontal connection members are configured to be engaged with each other in a snap-fit manner so as to connect the plurality of adapters side by side.

In the above mentioned adapter assembly, the first horizontal connection member comprising: a connection portion formed by extending from the outer side of the first vertical wall in the horizontal direction ; and an engagement portion formed by extending from an end of the connection portion in at least one direction parallel to the first vertical wall; The second horizontal connection member comprising: a receiving groove formed in the second vertical wall and configured to receive the engagement portion of the first horizontal connection member of another adapter; and a first opening communicated with the receiving groove to permit the engagement portion of the another adapter to be inserted into the receiving groove through the first opening.

In the above mentioned adapter assembly, the second horizontal connection member further comprises a second opening communicated with the receiving groove and configured to be fitted with the connection portion of the another adapter, so that the connection portion of the another adapter is allowed to pass through the second opening during inserting the engagement portion of the another adapter into the receiving groove.

In the above mentioned adapter assembly, the engagement portion has a substantively U-shape and comprises two elastic arms and a base connected between ends of the two

elastic arms; and the connection portion is connected between the base and the first vertical wall.

In the above mentioned adapter assembly, a projection is formed on an end of each of the elastic arms; and when the engagement portion of the another adapter acted as an insertion end is inserted into the receiving groove, the projection of the another adapter is exposed outside the first opening to block the engagement portion from being further inserted.

In the above mentioned adapter assembly, each of the adapters further comprises: two positioning portions formed by protruding from the second vertical wall and separate from the first opening by a predetermined distance to locate the projection of the another adapter between the second horizontal connection member and the positioning portions when the engagement portion of the another adapter is inserted into the receiving groove.

In the above mentioned adapter assembly, the second horizontal connection member further comprises a third opening communicated with the receiving groove and opposite to the first opening. A projection is formed on an end of each of the elastic arms. When the engagement portion of the another adapter acted as an insertion end is inserted into the receiving groove, the projection of the another adapter is exposed outside the third opening to block the engagement portion of the another adapter from being retreated from the receiving groove.

In the above mentioned adapter assembly, the first horizontal connection member is disposed in a notch formed in the first vertical wall; and the second horizontal connection member is protruded from the second vertical wall.

In the above mentioned adapter assembly, the adapter assembly further comprises a first installation member and a second installation member. The first installation member comprises a first plate body; and a first auxiliary connection member formed on a first side of the first plate body and configured the same as the first horizontal connection member so as to engage with the second horizontal connection member of one adapter at the outmost side of a row of adapters. The second installation member comprises a second plate body; and a second auxiliary connection member formed on a first side of the second plate body and configured the same as the second horizontal connection member so as to engage with the first horizontal connection member of another adapter at the outmost side of the row of adapters.

In the above mentioned adapter assembly, the first installation member further comprises a first installation lug formed on a second side of the first plate body; and the second installation member further comprises a second installation lug formed on a second side of the second plate body.

In the above mentioned adapter assembly, each of the connection devices comprises: first vertical connection members formed by extending from outer sides of the first and second vertical walls proximate to the top wall or the bottom wall; and second horizontal

connection members formed on outer sides of the first and second vertical walls proximate to the bottom wall or the top wall and configured to be inserted into and fixed in a slot in the first vertical connection member of another adapter. The plurality of adapters are stacked and engaged with each other in a vertical direction by engaging the first vertical connection members of one adapter and the second vertical connection members of the other adapter.

In the above mentioned adapter assembly, each of the first vertical connection members has a substantively U-shape, and comprises: a first arm formed by protruding outward from an upper end or a lower end of the outside of the first or second vertical wall; a second arm located above the top wall or the bottom wall and extending in a direction parallel to the first arm; and a base connected between the first and second arms to form the slot between the first and second arms. Each of the second vertical connection members comprises an elongated protrusion formed by protruding outward from the lower end or the upper end of the outside of the first or second vertical wall. The elongated protrusion is configured to be received in the slot between the first and second arms of the another adapter to stack and engage two adapters.

In the above mentioned adapter assembly, a free end of the second arm is formed with a block portion extending inward to prevent the elongated portion from being disengaged from the slot between the first and second arms.

In the above mentioned adapter assembly, each of the connection devices comprises a vertical connection member having a substantively L-shape and a receiving groove. The vertical connection member comprises a base vertically extending outward from the top wall or the bottom wall; and a arm extending from an end of the base in a direction parallel to an outer surface of the top wall or the bottom wall. The receiving groove is formed in the bottom wall or the top wall and configured to receive the arm of another adapter to stack and engage two adapters.

In the above mentioned adapter assembly, each of the adapters further comprises installation members formed by protruding from the first and second vertical walls to mount the adapter assembly on a mounting panel.

According to another aspect of the present invention, there is provided a connector assembly, comprising: the adapter assembly according to the above various embodiments; and a plurality of connectors each coupled into one of the interfaces of the respective adapter.

In the above mentioned connector assembly, the connector is a fiber optic connector.

In various exemplary embodiments of the present invention, a plurality of adapters may be connected together in order in a manner of side by side in a horizontal direction and/or stacked in a vertical direction, for example, two adjacent adapters may be removably connected together in a snap-fit manner, so that the space above a mounting panel for mounting the plurality of adapters can be utilized optimally.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other features of the present invention will become more apparent by describing in detail exemplary embodiments thereof with reference to the accompanying drawings, in which:

Fig.1 is an illustrative perspective view of an adapter assembly according to a first exemplary embodiment of the present invention;

Fig.2 is an illustrative perspective view of a row of adapters arranged in the middle of the adapter assembly shown in Fig.1;

Fig.3 is an exploded view of a portion of parts of the row of adapters of Fig.2 before being assembled;

Fig.4 is an illustrative perspective view of two rows of adapters arranged at the lower of the adapter assembly shown in Fig.1;

Fig.5 is an illustrative perspective view of one adapter of the adapter assembly shown in Fig.1;

Fig.6 is an illustrative perspective view of a connection device of the adapter assembly shown in Fig.1;

Fig.7 is an illustrative perspective view of an installation member of the adapter assembly shown in Fig.1;

Fig.8 is an illustrative perspective view of an adapter assembly according to a second exemplary embodiment of the present invention;

Fig.9 is an illustrative perspective view of one adapter of the adapter assembly shown in Fig.8 when viewing from a first side in a first orientation;

Fig.10 is another illustrative perspective view of the adapter of Fig.9 when viewing from the first side in a second orientation;

Fig.11 is an illustrative perspective view of the adapter of Fig.9 when viewing from a second side;

Fig.12 is a local enlarged cross section view of two adjacent connected adapters of the adapter assembly shown in Fig.8 along a line A-A of Fig.10 (or a line B-B of Fig.11), which shows an exemplary embodiment of a first connection form of a first connection member and a second connection member;

Fig.13 is an enlarged cross section view of an exemplary embodiment of another connection form of a first connection member and a second connection member;

Fig.14 is an illustrative perspective view of a first installation member of the adapter assembly shown in Fig.8, as viewed from an inner side;

Fig.15 is another illustrative perspective view of the first installation member of the adapter assembly shown in Fig.8, as viewed from an outer side;

Fig.16 is an illustrative perspective view of a second installation member of the adapter assembly shown in Fig.8, as viewed from an outer side;

Fig.17 is another illustrative perspective view of the second installation member of the

adapter assembly shown in Fig.8, as viewed from an outer side;

Fig.18 is an illustrative perspective view of an adapter assembly according to a third exemplary embodiment of the present invention;

Fig.19 is an illustrative perspective view of one adapter of the adapter assembly shown in Fig.18;

Fig.20 is an illustrative perspective view of two conventional fiber optic connectors;

Fig.21 is an illustrative perspective view of a conventional adapter coupled with the conventional fiber optic connectors shown in Fig.20; and

Fig.22 is a cross section view of the adapter of Fig.21 taken along a line C-C.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS OF THE IVENTION

Exemplary embodiments of the present disclosure will be described hereinafter in detail with reference to the attached drawings, wherein the like reference numerals refer to the like elements. The present disclosure may, however, be embodied in many different forms and should not be construed as being limited to the embodiment set forth herein; rather, these embodiments are provided so that the present disclosure will be thorough and complete, and will fully convey the concept of the disclosure to those skilled in the art.

The adapter of the present invention may be used with the conventional fiber optic connectors (for example, a LC fiber optic connector) 400 shown in Fig.20 or a fiber optic connector (for example, for splicing, distributing or abutting two fibers of two fiber optic cables) disclosed in Chinese Patent Application No.201210037495.6 filed by the applicant of the present invention. The adapter assembly for coupling with, for example, a plurality of connectors of Fig.20 according to various exemplary embodiments of the present invention comprises a plurality of adapters 10 each including a housing 1 made of, for example, plastic material ; and at least one connection device. The housing 1 may be formed with at least one interfaces 2 each for coupling with one of the connectors. Adjacent walls of the interfaces 2 of two adjacent adapters 10 of the plurality of adapters 10 are connected with each other by the at least one connection device 3 in a snap-fit manner, so that the plurality of adapters 10 are connected together. For example, the plurality of adapters 10 may be connected together in order in a manner of side by side in a horizontal direction and/or stacked in a vertical direction.

Figs.1-7 show an illustrative perspective view of an adapter assembly 100 according to a first exemplary embodiment of the present invention.

As shown in Figs.1-7, the adapter assembly 100 may comprise nine adapters 10 arranged in an array of 3 rows and 3 columns. The housing 1 of each of the adapters 10 may exhibit a substantively cuboid shape and comprise a first vertical wall 11, a second vertical wall 12 opposite to the first vertical wall, a top wall 13 and a bottom wall 14 for defining the interface 2. The connection device is configured to connect the adjacent first and second

vertical walls 11, 12 and/or the adjacent top and bottom walls 13, 14 of two adjacent adapters of the plurality of adapters 10. Furthermore, the connection device may be an elastic clamping member 3 configured to clamp the adjacent first and second vertical walls 11, 12 and/or the adjacent top and bottom walls 13, 14 of two adjacent adapters of the plurality of adapters 10.

In another exemplary embodiment, as shown in Fig.5, each of the first vertical wall 11, the second vertical wall 12, the top wall 13 and the bottom wall 14 is formed with a recess 111, 121, 131 or 141 in an inner side thereof, respectively. The recesses 111, 121, 131, 141 may have a substantively same shape. The clamping member 3 comprises a pair of clamping arms 30 each having a shape substantively matched with that of a respective recess 111, 121, 131 or 141, so that the pair of clamping arms 30are received in two respective recess 111, 121, 131, 141. For example, as shown in Figs.2-3, two clamping arms 30 of the clamping member 3 may be received in the recess 121 of the second vertical wall 12 of a first adapter and the recess 111 of the first vertical wall 11 of a second adapter in a same row of adapters 10. In this way, the plurality of adapters 10 can be connected and fixed together in order in a manner of side by side in a horizontal direction. Furthermore, as shown in Fig.4, two clamping arms 30 of the clamping member 3 may be received in the recess 141 of the bottom wall 14 of an upper adapter and the recess 131 of the top wall 13 of a lower adapter in a same column of adapters 10. In this way, the plurality of adapters 10 can be stacked and fixed together in a vertical direction. As shown in Fig. 4, each of the clamping arms 30 may exhibit a substantively triangle shape to facilitate the insertion of the clamping member 3 into the respective recesses. In an exemplary embodiment, the recess 131 in the top wall 13 may be formed in a receiving groove for receiving, for example, a locking member of the connector 400 shown in Fig.20.

Since each of the first vertical wall 11, the second vertical wall 12, the top wall 13 and the bottom wall 14 is formed with a recess 111, 121, 131 or 141 in the inner side thereof, when two adapters 10 are placed together either by arranging them side by side in a direction or by stacking them in the vertical direction, there are always two walls abutting against each other, for example, the second vertical wall 12 of an adapter and the first vertical wall 11 of another adapter abut against each other, or the bottom wall 14 of an adapter and the top wall 13 of another adapter abut against each other. Furthermore, the recesses 121, 111 or the recesses 141, 131 formed in inner surfaces of the walls are juxtaposed relative to each other, so that the clamping arms 30 of the clamping member 3 may be received in the recesses to connect two adjacent adapters 10 together.

Thus, the adapters of the first exemplary embodiment of can be arranged side by side and/or stacked with one over the other by means of the clamping member 3, saving the space for mounting the adapters 10. In a case where the adapters 10 of the adapter assembly 100 of the present invention are stacked with one over the other in the vertical direction, it is especially adapted to the connectors disclosed in Chinese Patent Application

No.201210037495.6 by the applicant of the present invention.

In a further exemplary embodiment, each of the clamping members 3 comprises a pair of holding portions 301 protruding toward each other at free ends of the pair of clamping arms 30. At a distal end of each of recesses is formed with a through hole 15 running through the first vertical wall 11, the second vertical wall 12, the top wall 13 and the bottom wall 14, and each of the holding portions 301 can be received in the respective through hole 15. In this way, the protruding holding portion 301 can enter into the through hole 15 during pushing the clamping member 3 into the recesses, so that the clamping member 3 can be firmly engaged in the recesses. Alternatively, the through hole 15 may be replaced with a notch running through a part of the wall thickness of the housing 1 (or not running through the wall thickness of the housing 1) as long as the notch is deeper than the other parts of the recess.

The adapter assembly according to the first exemplary embodiment of the present invention may further comprise at least one pair of installation members 4. One of the pair of installation members 4 is mounted on the first vertical wall 11 or the second vertical wall 12 at the outmost side of a row of adapters 10. As shown in Fig.7, each of the installation members 4 comprises an elongated body 41 made of, for example, a plate material, an installation lug 42 and an auxiliary clamping component 43. The body 41 has a first end and a second end opposite to the first end, and the length of the body 41 from the first end to the second end is equal to about an half of a longitudinal length of the adapter 10. The installation lug 42 perpendicularly extends from the first end of the body 41. The auxiliary clamping component 43 is formed by bending inward from the second end of the body 41 by about 180 degrees. With this configuration, the auxiliary clamping component 43 is engaged in the recess 111 or 121 of the first vertical wall 11 or the second vertical wall 12 at the outmost side of the row of adapters 10. Also, an installation hole 421 is formed in the installation lug 42. An elastic clamping protrusion 431 for fitting in the through hole 15 is formed on a free end of the auxiliary clamping component 43. Since the length of the body 41 is equal to about an half of the longitudinal length of the adapter 10, two installation members 4 can be mounted on the first vertical wall 11 or the second vertical wall 12 from both ends thereof, respectively, and the installation lugs 42 of two installation members 4 mounted on a same outermost vertical wall abut against each other, so that the entire adapter assembly 100 can be easily mounted on a mounting frame with the installation members 4 as well as connection pieces, for example, bolts or the like which pass through the through holes 15.

Figs.8-17 show an illustrative perspective view of an adapter assembly 100' according to a second exemplary embodiment of the present invention.

In the adapter assembly 100' of the second exemplary embodiment, the housing 1' of each of the adapters 10' may exhibit a substantively cuboid shape and comprise a first vertical wall 11', a second vertical wall 12' opposite to the first vertical wall, a top wall 13'

and a bottom wall 14' for defining the interface 2'. The connection device is configured to connect the adjacent first and second vertical walls 11', 12' of two adjacent adapters 10' of the plurality of adapters 10'. In this way, a plurality of adapters 10' can be fixed together side by side in the horizontal direction.

Furthermore, each of the connection devices comprises at least one first horizontal connection member 31 (please refer to Figs.9-10) and at least one second horizontal connection member 32 (please refer to Fig.11). The first horizontal connection member 31 is formed by extending from an outer side of the first vertical wall 11' in a horizontal direction. The second horizontal connection member 32' is formed on an outer side of the second vertical wall 12'. The first horizontal connection members 31 of one adapter and the second horizontal connection members 32 of the other adapter are configured to be capable of being engaged with each other in a snap-fit manner so as to connect the plurality of adapters 10' side by side in the horizontal direction.

Referring to Figs.9-10, 12, each of the first horizontal connection members 31 comprises a connection portion 311 (please refer to Fig.12) and an engagement portion 312. The connection portion 311 is formed by extending from the outer side of the first vertical wall 11' in the horizontal direction. The engagement portion 312 is formed by extending from an end of the connection portion 311 in at least one direction (for example, as shown in Figs.9, 12, a forward direction, a rearward direction and an upward direction) parallel to the first vertical wall 11'.

Referring to Figs.11-12, each of the second horizontal connection members 32 comprises a receiving groove 321 and a first opening 322 located at an upper end of the receiving groove 321. The receiving groove 321 is formed in the second vertical wall 12' and configured to receive the engagement portion 312 of the first horizontal connection member 31 of another adapter. The first opening 322 is communicated with the receiving groove 321 to permit the engagement portion 312 of the another adapter to be downwardly inserted into the receiving groove 321 through the first opening 322.

Furthermore, the second horizontal connection member 32 may further comprise a second opening 323 extending in the vertical direction. As shown in Figs.11-12, the second opening 323 is communicated with the receiving groove 321 and configured to be fitted with the connection portion 311 of the another adapter to allow the connection portion 311 of the another adapter to pass through the second opening 323 during inserting the engagement portion 312 of the another adapter into the receiving groove 321. In the cross section view of Fig.12, the receiving groove 321 is formed by two substantially L-shaped structures. Two walls of the two L-shaped structures are formed by extending from the second vertical wall 12', the other two walls of the two L-shaped structures extend toward each other to form the second opening 323. On the other hand, as shown in Fig. 9, the engagement portion 312 has a substantively U-shape and comprises two elastic arms 313 and a base 314 connected between ends of the two elastic arms 313. The connection portion 311 is connected between

the base 314 and the first vertical wall 11', as shown in Fig. 13.

Furthermore, a projection 315 is formed on an end of each of the elastic arms 313. When the engagement portion 312 of the another adapter acted as an insertion end is downwardly inserted into the receiving groove 321 through the first opening 322, the projection 315 of the another adapter is exposed outside the first opening 322 to block the engagement portion 312 from being further inserted.

In an exemplary embodiment, as shown in Fig. 11, each of the adapters 10' may further comprises two positioning portions 5. The two positioning portions 5 are formed by protruding from the second vertical wall 12' and separate from the first opening 322 by a predetermined distance to locate the projection 315 of the another adapter between the second horizontal connection member 32 and the positioning portions 5 when the engagement portion 312 of the another adapter is inserted into the receiving groove 321. More specifically, during engaging the engagement portion 312 of the another adapter is inserted into the receiving groove 321, the base 314 and the elastic arms 313 firstly pass through between the two positioning portions 5. After passing through between the two positioning portions 5, the projection 315 is located between the upper end of the second horizontal connection member 32 and the positioning portions 5. In this way, the projection 315 can block the engagement portion 312 from being further downward inserted or being upwardly disengaged from the receiving groove 321. The upper and lower surfaces of the projection 315 may be configured to be sloped guide surfaces, so that the projection 315 can overcome the block of the second horizontal connection member 32 or the positioning portions 5 through the sloped guide surfaces under a relatively larger force.

The above described engagement portion 312 is a U-shaped member with an opening upwardly as shown in the embodiment of Figs.9-10. But the present invention is not limited to this, in another embodiment, the engagement portion 312 may be a U-shaped member with an opening downwardly and a connection portion connected to the uppermost end of a base. In this case, the second opening may be omitted.

In an exemplary embodiment, the second horizontal connection member 32 may further comprise a third opening (not shown) communicated with the receiving groove 321 and opposite to the first opening 322. A projection is formed on an end of each of the elastic arms. When the end of the elastic arm of the another adapter as an insertion end is downwardly inserted into the receiving groove 321, the projection of the another adapter is exposed outside the third opening to block the engagement portion of the another adapter from being retreated from the receiving groove 321.

In an exemplary embodiment, the first horizontal connection member 31 is disposed in a notch 112 formed in the first vertical wall 11', and the second horizontal connection member 32 is protruded from the second vertical wall 12'. In this way, when the first and second horizontal connection members 31, 32 are connected together, the first and second vertical walls 11', 12' of two adjacent adapters 10' abut against each other, saving the

mounting space.

In an alternative embodiment, as shown in Fig.13, both the connection portion 311' and the engagement portion 312' of the first horizontal connection member are provided beyond the outer surface of the first vertical wall 11A. The receiving groove 321' of the second horizontal connection member is formed in the second vertical wall 12A, that is, the entire second horizontal connection member is provided not beyond the outer surface of the second vertical wall 12A. In this way, when the first and second horizontal connection members are connected together, the first and second vertical walls 11A, 12B of two adjacent adapters 10' also can abut against each other, thereby saving the mounting space of the adapters.

As shown in Figs.14-17, the adapter assembly 100' according to the second exemplary embodiment of the present invention may further comprise a first installation member 6 and a second installation member 7. The first installation member 6 comprises a first plate body 61 and a first auxiliary connection member 62. The first auxiliary connection member 62 is formed on a first side of the first plate body 61 and configured the same as the first horizontal connection member 31 so as to engage with the second horizontal connection member 32 of one adapter at the outmost side of a row of adapters. In this way, the first installation member 6 can be mounted on the adapter at the outmost side of the row of adapters. The second installation member 7 comprises a second plate body 71 and a second auxiliary connection member 72. The second auxiliary connection member 72 is formed on a first side of the second plate body 71 and configured the same as the second horizontal connection member 32 so as to engage with the first horizontal connection member 31 of another adapter at the outmost side of the row of adapters. In this way, the second installation member 7 can be mounted on the another adapter at the outmost side of the row of adapters.

Furthermore, the first installation member 6 may further comprise a first installation lug 63 formed on a second side of the first plate body 61, and the second installation member may further comprise a second installation lug 73 formed on a second side of the second plate body 71. Each of the first and second installation lugs 63, 73 is provided with at least one installation hole 64, 74, so that the entire adapter assembly 100' can be mounted on the mounting panel (not shown, please refer to Fig.11) by means of connection pieces, for example, bolts or the like.

Figs.18-19 show an illustrative perspective view of an adapter assembly 100'' according to a third exemplary embodiment of the present invention.

As shown in Figs.18-19, the adapter assembly 100'' comprises a plurality of adapters 10''. Each of the adapters 10'' comprises two first vertical connection members 31' and two second vertical connection members 32'. The two first vertical connection members 31' are provided on upper ends outside the first vertical wall 11'' and the second vertical wall, respectively, and the two second vertical connection members 32' are provided on lower

ends outside the first vertical wall 11'' and the second vertical wall, respectively. The two first vertical connection members 31' and the two second vertical connection members 32' can be engaged together, respectively, so that the plurality of adapters 10'' can be stacked one over the other in the vertical direction.

Furthermore, in the adapter assembly 100'', each of the first vertical connection members 31' has a substantively U-shape and comprises a first arm 313', a second arm 314' and a base 315'. The first arm 313' is formed by protruding outward from the upper end of the outside of the first vertical wall 11'' or the second vertical wall. The second arm 314' is located above the top wall 13'' and extends in a direction parallel to the first arm 313'. The base 315' is connected between the first and second arms 313', 314', so that a slot is formed between the first and second arms 313', 314'. Each of the second vertical connection members 32' comprises an elongated protrusion formed by protruding outward from the lower end of the outside of the first vertical wall 11'' or the second vertical wall. The elongated protrusion is configured to be received in the slot between the first and second arms 313', 314' of the another adapter to stack and engage two adapters in the vertical direction. Also, an inner side of the first arm 313' is flush with the upper surface of the top wall 13'', and the lower side of the elongated protrusion is flush with the lower surface of the bottom wall. In this way, when two adjacent adapters are stacked and engaged in the vertical direction, the bottom wall of the upper adapter can abut against the top wall of the lower adapter, thereby saving the mounting space of the entire adapter assembly.

In a further embodiment, a free end of the second arm 314' is formed with a block portion 316' extending inward to prevent the elongated portion from being disengaged from the slot between the first and second arms 313', 314'. Also, each of the adapters 10'' further comprises an installation members 8 protruding from the first vertical wall 11'' and the second vertical wall to mount the entire adapter assembly on a mounting panel 101, as shown in Fig. 19.

In an alternative embodiment, each of the first vertical connection members has a substantively U-shape and comprises: a first arm formed by protruding outward from the lower end of the outside of the first vertical wall 11'' or the second vertical wall; a second arm located below the bottom wall and extending in a direction parallel to the first arm; and a base connected between the first and second arms to form a slot between the first and second arms. Each of the second vertical connection members comprises an elongated protrusion formed by protruding outward from the upper end of the outside of the first vertical wall or the second vertical wall. The elongated protrusion is configured to be received in the slot between the first and second arms of the another adapter to stack and engage two adapters in the vertical direction. Also, an inner side of the first arm is flush with the lower surface of the bottom wall, and the upper side of the elongated protrusion is flush with the upper surface of the top wall.

In another alternative embodiment, each of the connection devices comprises a vertical

connection member and a receiving groove. The vertical connection member has a substantively L-shape and comprises: a base vertically extending outward from the top wall or the bottom wall; and a arm extending from an end of the base in a direction parallel to an outer surface of the top wall or the bottom wall. The receiving groove is formed in the bottom wall or the top wall and configured to receive the arm of another adapter to stack and engage two adapters together in the vertical direction.

According to an exemplary embodiment of another aspect of the present invention, there is provided a connector assembly comprising: an adapter assembly according to the above mentioned embodiments; and a plurality of connectors each coupled into one of the interfaces of the respective adapter. Furthermore, the connector may be a fiber optic connector, for example, a LC fiber optic connector.

According to various exemplary embodiments of the present invention, a plurality of adapters may be connected together in order in a manner of side by side in a horizontal direction and/or stacked with one on the other in a vertical direction, for example, two adjacent adapters may be removably connected together in a snap-fit manner, so that the space above a mounting panel for mounting the plurality of adapters can be utilized optimally. The entire adapter assembly may be mounted on the mounting panel by means of the installation members. The outer connection features on the adapters may be same with each other, and the inner features of the adapter may be same as those of the conventional adapter, so that the adapters of the present invention may be adapted to couple with the standard LC fiber optic connectors in a high density to optimally utilize the space above a mounting panel. At the same time, the adapters can be assembled in a modularization manner to ensure that an appreciate number of adapters can be quickly assembled together according to various requirements from customers.

Although it has been described the connector of the present invention by using the optical cable as an object to be spliced in the above mentioned embodiments, it should be appreciated for those skilled in this arts that the connector of the present invention may be used to couple two electric cables in some other embodiments. More particularly, for example, in various network communication terminations, such as computer, router, server, digital switch, and so on, having a plug connector and a receptacle connector, the plug connector may be provided with the locking mechanism having a slope arm, a driving arm and a locking protrusion according to the present invention.

It should be appreciated for those skilled in this art that the above embodiments are intended to be illustrated, and not restrictive. For example, many modifications may be made to the above embodiments by those skilled in this art, and various features described in different embodiments may be freely used in combination with each other without conflict in configuration or principle of the present invention, so that more kinds of connector and adapter assemblies can be achieved with overcoming the technical problem of the present invention.

Although several exemplary embodiments have been shown and described, it would be appreciated by those skilled in the art that various changes or modifications may be made in these embodiments without departing from the principles and spirit of the disclosure, the scope of which is defined in the claims and their equivalents.

What is claimed is,

1. An adapter assembly (100, 100', 100") for coupling with a plurality of connectors, comprising:

a plurality of adapters (10, 10', 10") each including a housing (1, 1', 1"), the housing being formed with at least one interfaces (2, 2', 2") each for coupling with one of the plurality of connectors; and

at least one connection device each configured to connect adjacent walls of the interfaces of two adjacent adapters of the plurality of adapters in a snap-fit manner, so that the plurality of adapters are connected together.

2. The adapter assembly according to claim 1,

wherein the housing of each of the adapters exhibits a substantively cuboid shape and comprises a first vertical wall (11), a second vertical wall (12) opposite to the first vertical wall, a top wall (13) and a bottom wall (14) for defining the interface (2); and

wherein the connection device is configured to connect the adjacent first and second vertical walls and/or the adjacent top and bottom walls of two adjacent adapters of the plurality of adapters.

3. The adapter assembly according to claim 2,

the connection device is an elastic clamping member configured to clamp the adjacent first and second vertical walls and/or the adjacent top and bottom walls of two adjacent adapters of the plurality of adapters.

4. The adapter assembly according to claim 3,

wherein each of the first vertical wall, the second vertical wall, the top wall and the bottom wall is formed with a recess (111, 121, 131, 141) in an inner side thereof; and

wherein the clamping member comprises a pair of clamping arms (30) each constructed to substantively match with that of the recess to be received in the respective recess.

5. The adapter assembly according to claim 4,

wherein each of the clamping members comprises a pair of holding portions (301) protruding toward each other at free ends of the pair of clamping arms; and

wherein a distal end of each of the recesses is formed with a through hole (15) running through the first vertical wall, the second vertical wall, the top wall and the bottom wall for receiving the respective holding portion therein.

6. The adapter assembly according to claim 4,

wherein each of the clamping arms exhibits a substantively triangle shape.

7. The adapter assembly according to any one of claims 3-6, further comprising at least one pair of installation members (4),

wherein one of the pair of installation members is mounted on the first vertical wall or the second vertical wall at the outmost side of a row of adapters,

each of the installation members comprises:

a body (41) having a first end and a second end opposite to the first end, and the length of the body from the first end to the second end being equal to about an half of a longitudinal length of the adapter;

an installation lug (42) perpendicularly extending from the first end of the body; and

an auxiliary clamping component (43) formed by bending inward from the second end of the body by about 180 degrees and engaged in the recess of the vertical wall at the outmost side of the row of adapters.

8. The adapter assembly according to claim 7,

wherein an installation hole (421) is provided in the installation lug; and

wherein an elastic clamping protrusion (431) is formed on a free end of the auxiliary clamping component.

9. The adapter assembly according to claim 2,

wherein each of the connection devices comprises:

at least one first horizontal connection member (31) formed by extending from an outer side of the first vertical wall in a horizontal direction; and

at least one second horizontal connection member (32) formed on an outer side of the second vertical wall,

wherein the first and second horizontal connection members are configured to be engaged with each other in a snap-fit manner so as to connect the plurality of adapters side by side.

10. The adapter assembly according to claim 9,

wherein the first horizontal connection member comprising:

a connection portion (311) formed by extending from the outer side of the first vertical wall in the horizontal direction ; and

an engagement portion (312) formed by extending from an end of the connection portion in at least one direction parallel to the first vertical wall,

wherein the second horizontal connection member comprising:

a receiving groove (321) formed in the second vertical wall and configured to receive the engagement portion of the first horizontal connection member of another

adapter; and

a first opening (322) communicated with the receiving groove to permit the engagement portion of the another adapter to be inserted into the receiving groove through the first opening.

11. The adapter assembly according to claim 10, wherein the second horizontal connection member further comprises a second opening (323) communicated with the receiving groove and configured to be fitted with the connection portion of the another adapter, so that the connection portion of the another adapter is allowed to pass through the second opening during inserting the engagement portion of the another adapter into the receiving groove.

12. The adapter assembly according to claim 11,

wherein the engagement portion has a substantively U-shape and comprises two elastic arms (313) and a base (314) connected between ends of the two elastic arms; and

wherein the connection portion is connected between the base and the first vertical wall.

13. The adapter assembly according to claim 12,

wherein a projection (315) is formed on an end of each of the elastic arms; and

wherein when the engagement portion of the another adapter acted as an insertion end is inserted into the receiving groove, the projection of the another adapter is exposed outside the first opening to block the engagement portion from being further inserted.

14. The adapter assembly according to claim 13, wherein each of the adapters further comprises:

two positioning portions (5) formed by protruding from the second vertical wall and separate from the first opening by a predetermined distance to locate the projection of the another adapter between the second horizontal connection member and the positioning portions when the engagement portion of the another adapter is inserted into the receiving groove.

15. The adapter assembly according to claim 12,

wherein the second horizontal connection member further comprises a third opening communicated with the receiving groove and opposite to the first opening,

wherein a projection is formed on an end of each of the elastic arms; and

wherein when the engagement portion of the another adapter acted as an insertion end is inserted into the receiving groove, the projection of the another adapter is exposed outside the third opening to block the engagement portion of the another adapter from being retreated from the receiving groove.

16. The adapter assembly according to any one of claims 9-15,
wherein the first horizontal connection member is disposed in a notch formed in the first vertical wall; and
wherein the second horizontal connection member is protruded from the second vertical wall.

17. The adapter assembly according to claim 16, further comprising:
a first installation member (6) comprising:
a first plate body (61); and
a first auxiliary connection member (62) formed on a first side of the first plate body and configured the same as the first horizontal connection member so as to engage with the second horizontal connection member of one adapter at the outmost side of a row of adapters,
a second installation member (7) comprising:
a second plate body (71); and
a second auxiliary connection member (72) formed on a first side of the second plate body and configured the same as the second horizontal connection member so as to engage with the first horizontal connection member of another adapter at the outmost side of the row of adapters.

18. The adapter assembly according to claim 17,
wherein the first installation member further comprises a first installation lug (63) formed on a second side of the first plate body; and
wherein the second installation member further comprises a second installation lug (73) formed on a second side of the second plate body.

20. The adapter assembly according to claim 2,
wherein each of the connection devices comprises:
first vertical connection members (31') formed by extending from outer sides of the first and second vertical walls proximate to the top wall or the bottom wall; and
second horizontal connection members (32') formed on outer sides of the first and second vertical walls proximate to the bottom wall or the top wall and configured to be inserted into and fixed in a slot in the first vertical connection member of another adapter,
wherein the plurality of adapters are stacked and engaged with each other in a vertical direction by engaging the first vertical connection members of one adapter and the second vertical connection members of the other adapter.

21. The adapter assembly according to claim 20,

wherein each of the first vertical connection members has a substantively U-shape, and comprises:

a first arm (313') formed by protruding outward from an upper end or a lower end of the outside of the first or second vertical wall;

a second arm (314') located above the top wall or the bottom wall and extending in a direction parallel to the first arm; and

a base connected between the first and second arms to form a slot between the first and second arms,

wherein each of the second vertical connection members comprises an elongated protrusion formed by protruding outward from the lower end or the upper end of the outside of the first or second vertical wall, and

wherein the elongated protrusion is configured to be received in the slot between the first and second arms of the another adapter to stack and engage two adapters.

22. The adapter assembly according to claim 21,

wherein a free end of the second arm is formed with a block portion (316') extending inward to prevent the elongated portion from being disengaged from the slot between the first and second arms.

23. The adapter assembly according to claim 2, wherein each of the connection devices comprises:

a vertical connection member having a substantively L-shape, and comprising:

a base vertically extending outward from the top wall or the bottom wall; and

a arm extending from an end of the base in a direction parallel to an outer surface of the top wall or the bottom wall, and

a receiving groove formed in the bottom wall or the top wall and configured to receive the arm of another adapter to stack and engage two adapters.

24. The adapter assembly according to any one of claims 20-23, wherein each of the adapters further comprises installation members (8) formed by protruding from the first and second vertical walls to mount the adapter assembly on a mounting panel.

25. A connector assembly, comprising:

an adapter assembly according to any one of claims 1-24; and

a plurality of connectors each coupled into one of the interfaces of the respective adapter.

26. The connector assembly according to claim 25, wherein the connector is a fiber optic

connector.

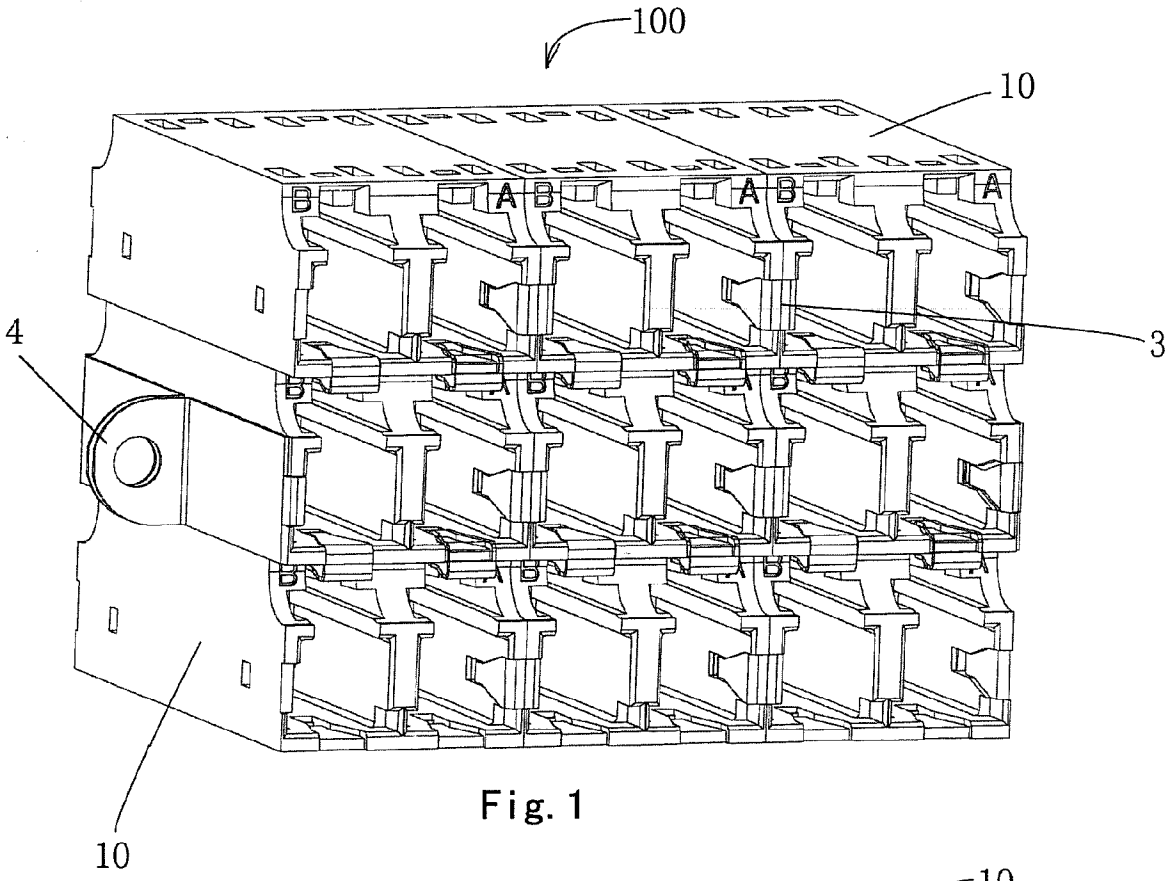


Fig. 1

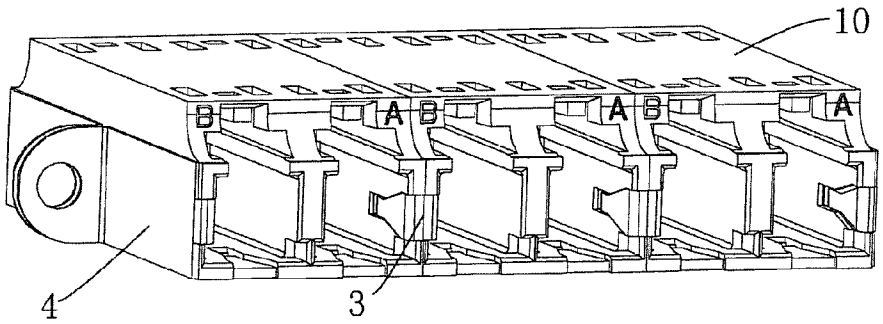


Fig. 2

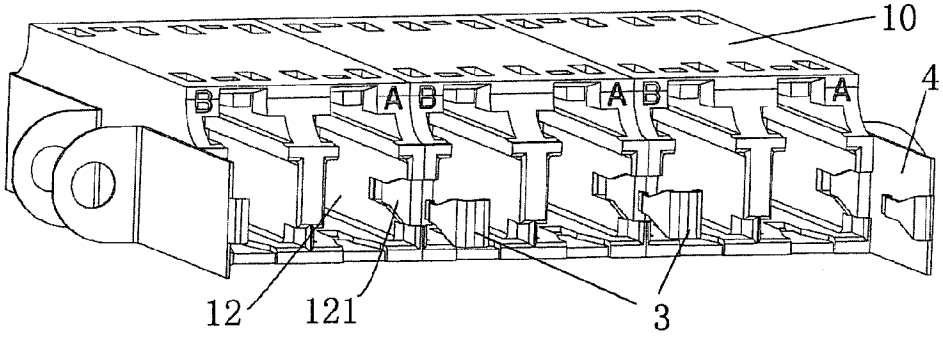


Fig. 3

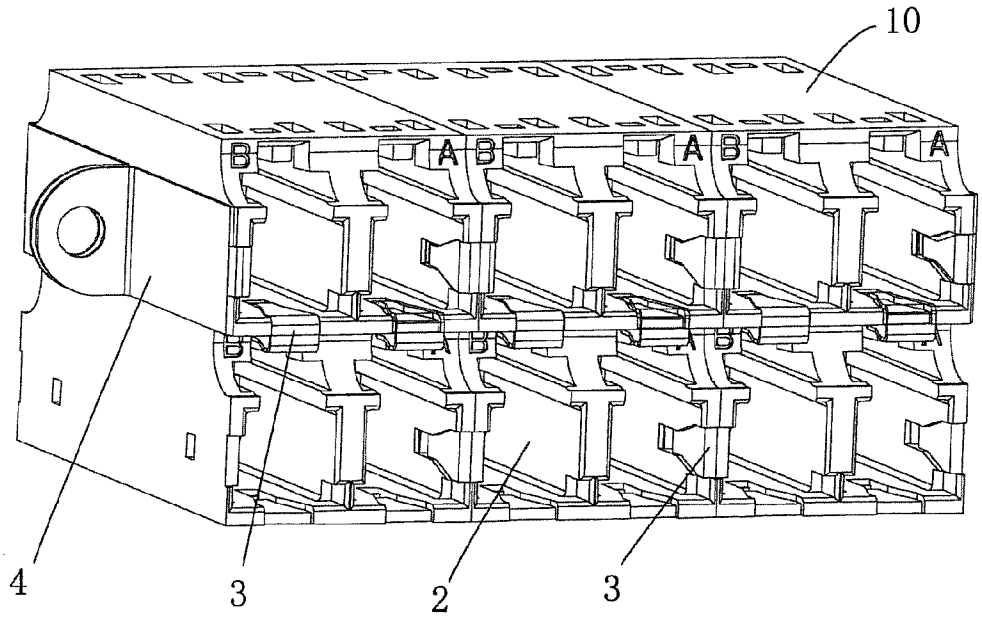


Fig. 4

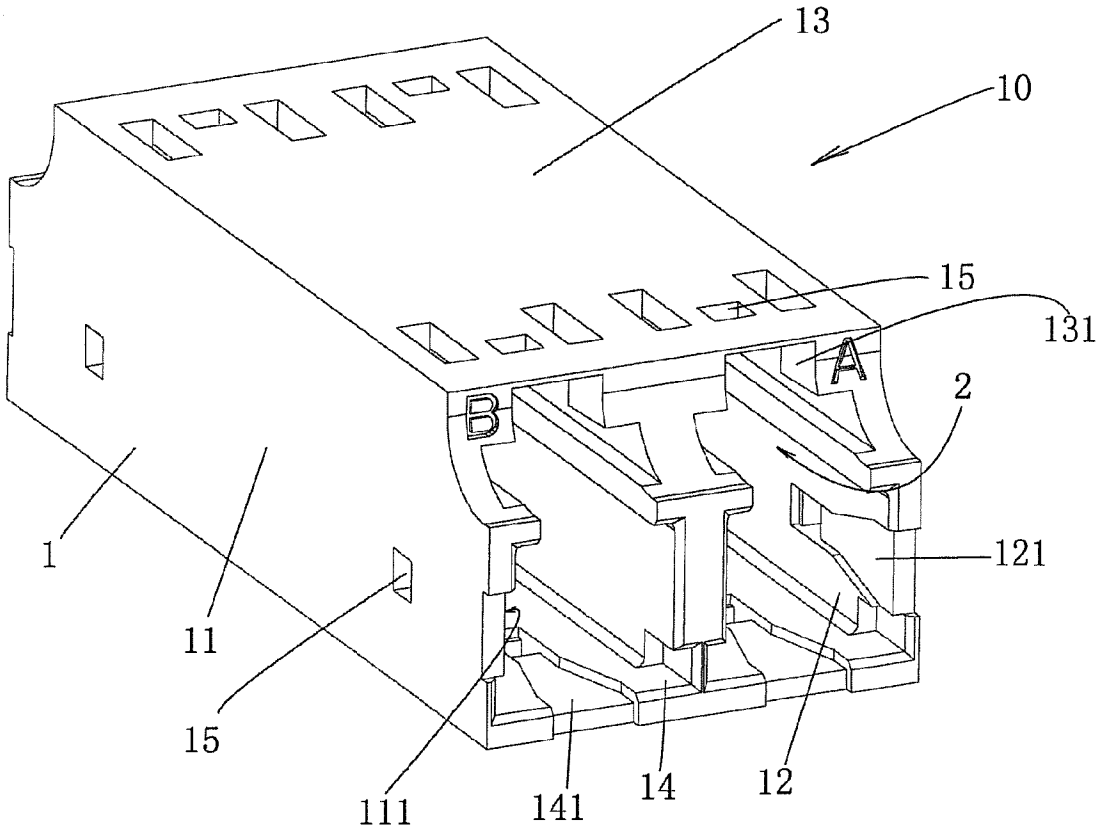


Fig. 5

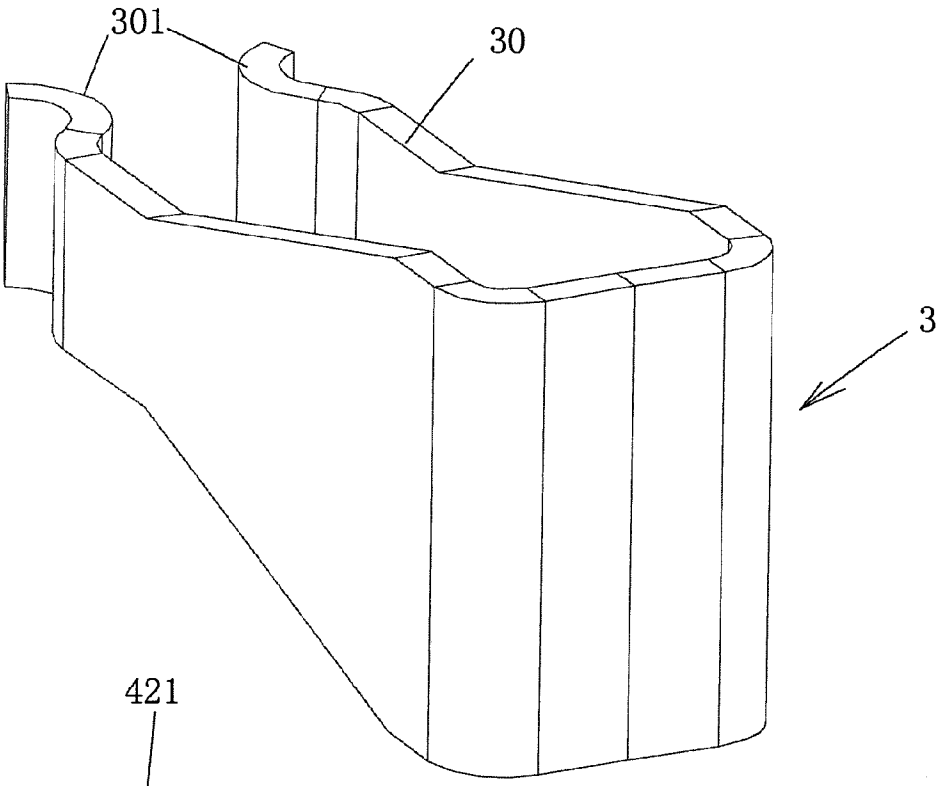


Fig. 6

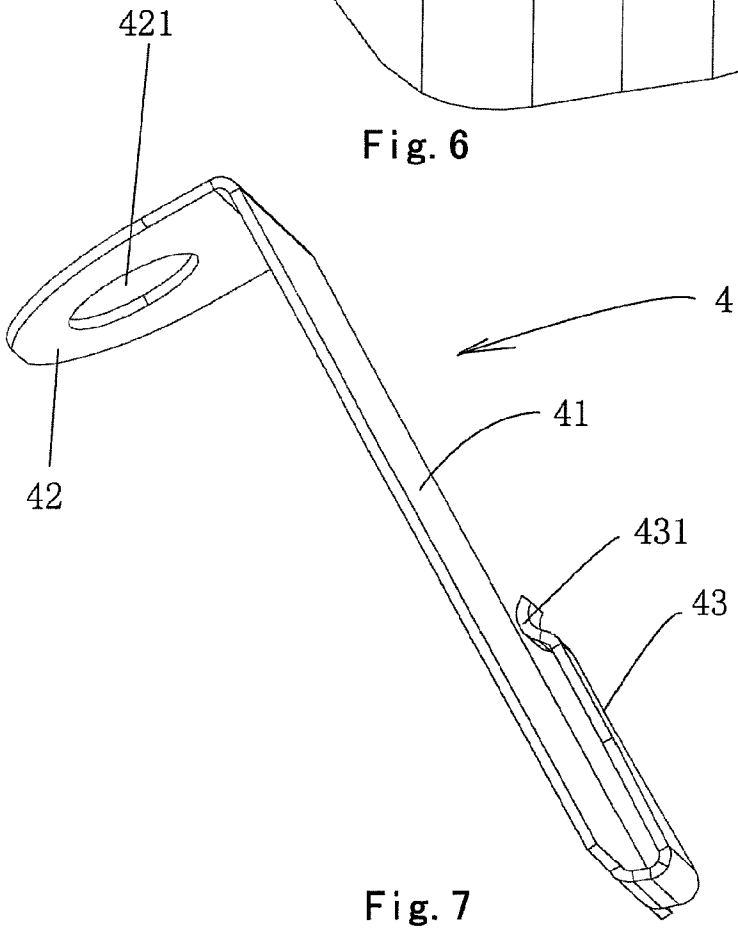


Fig. 7

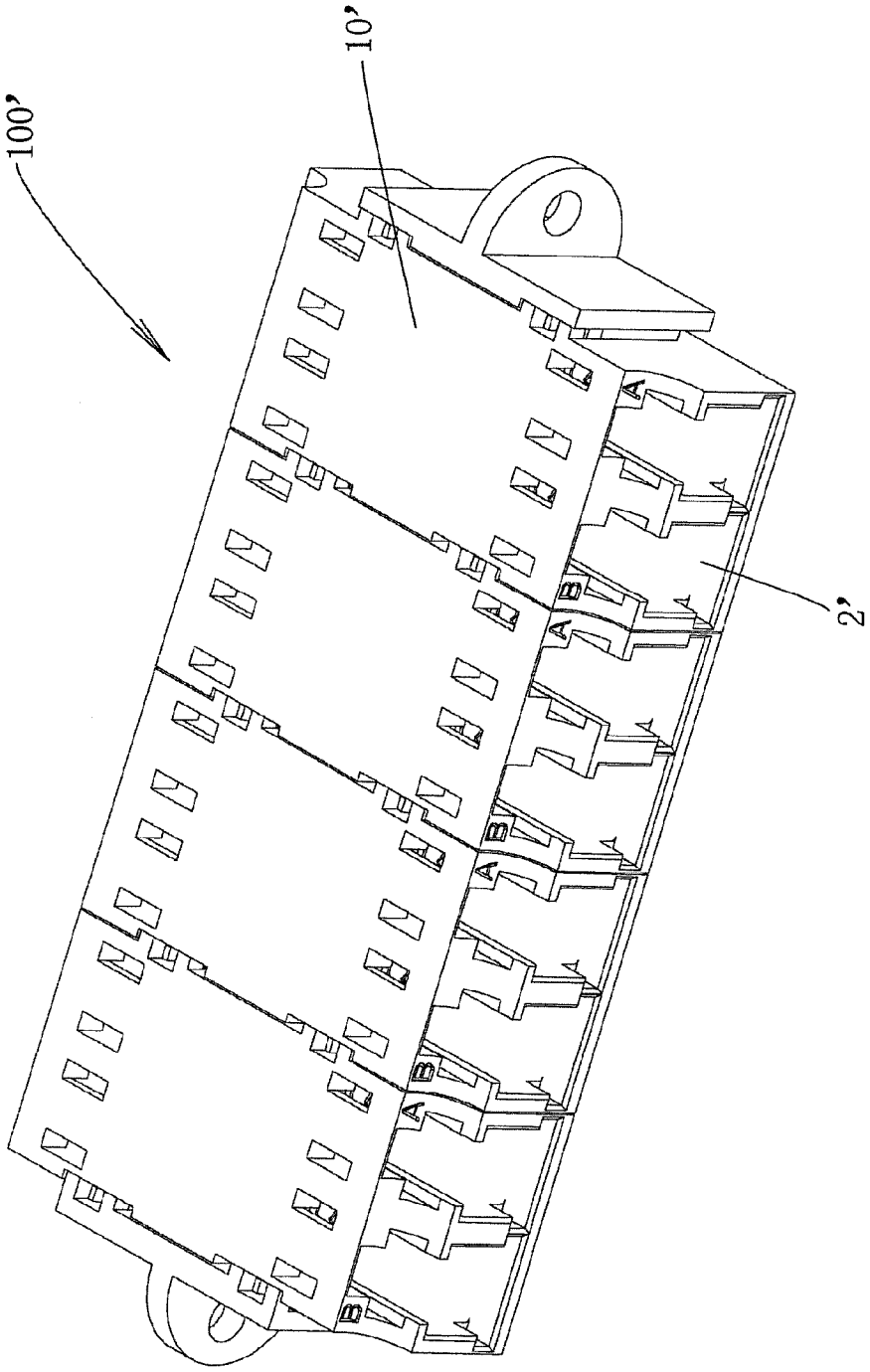


Fig. 8

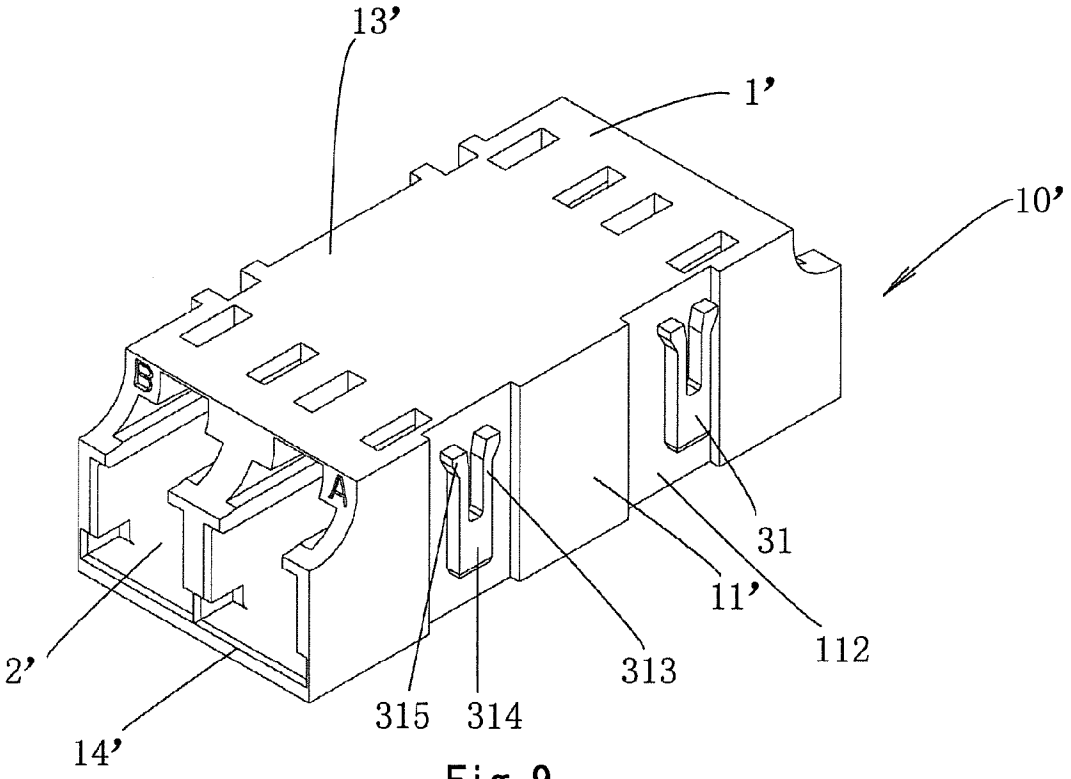


Fig. 9

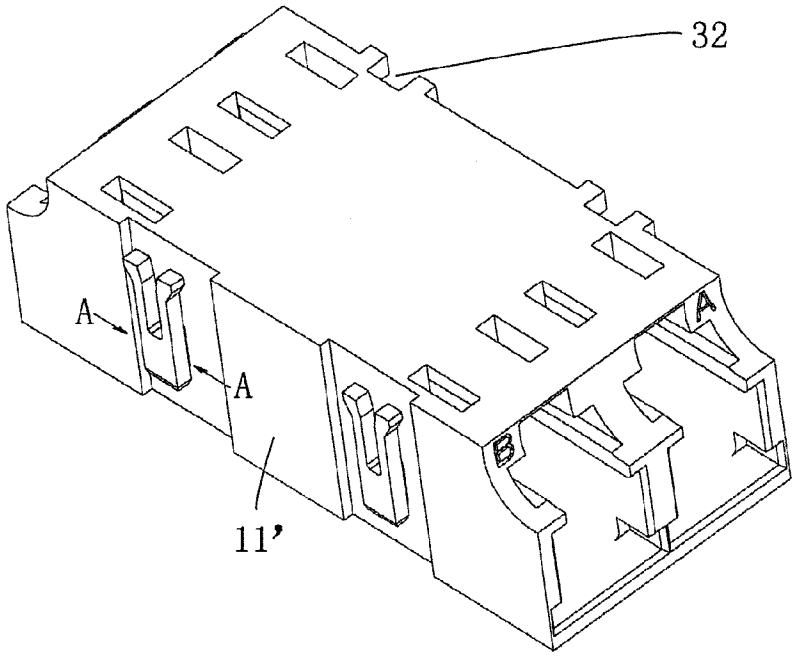


Fig. 10

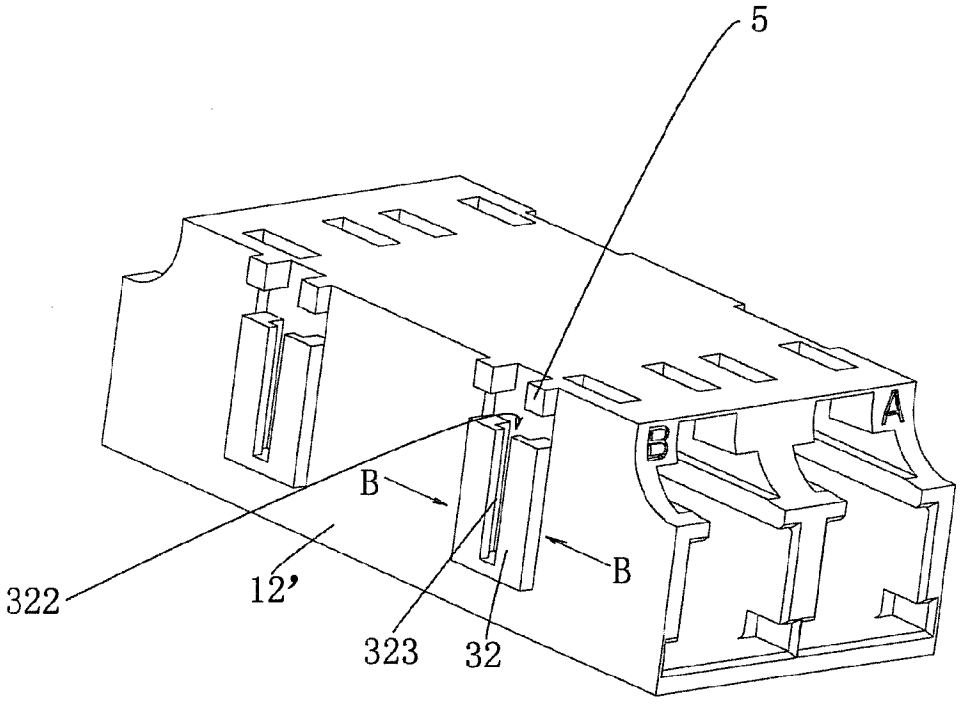


Fig. 11

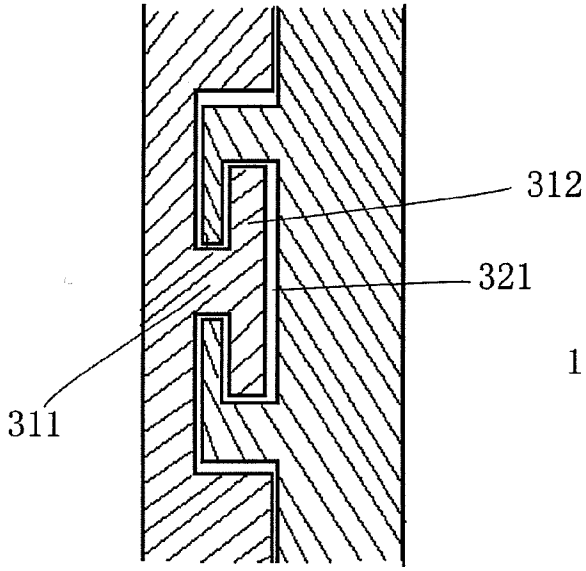


Fig. 12

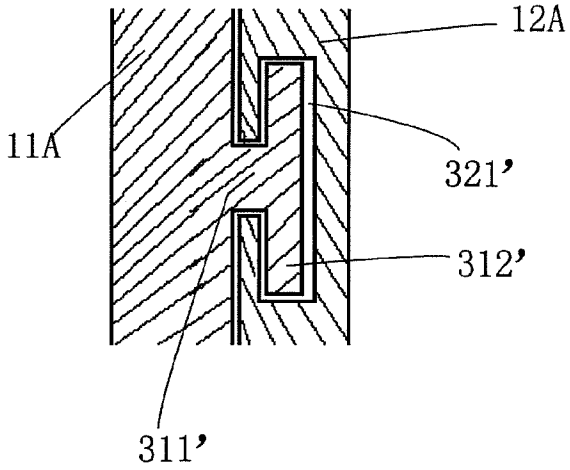


Fig. 13

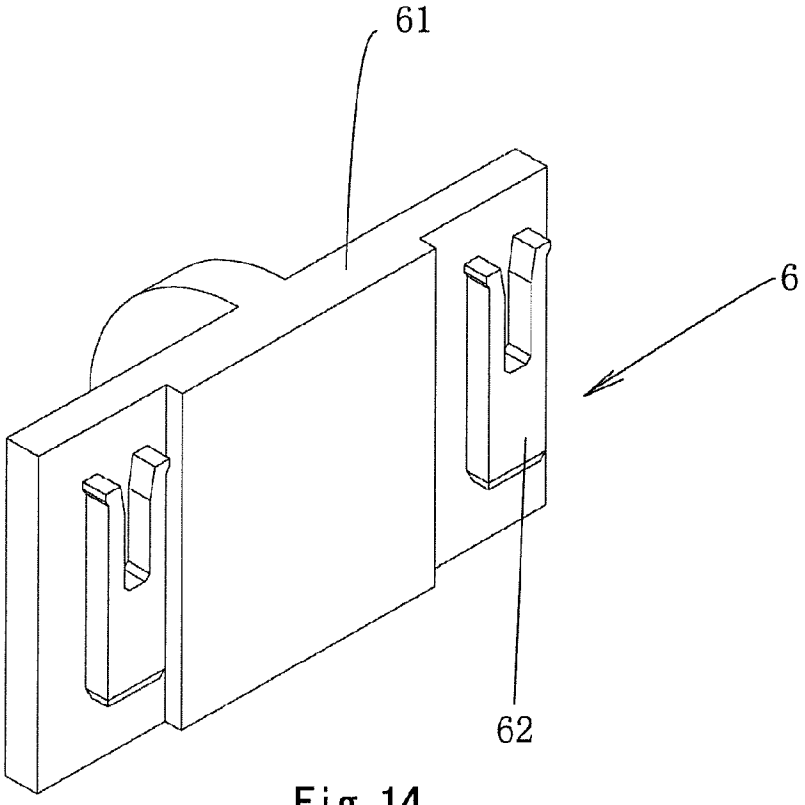


Fig. 14

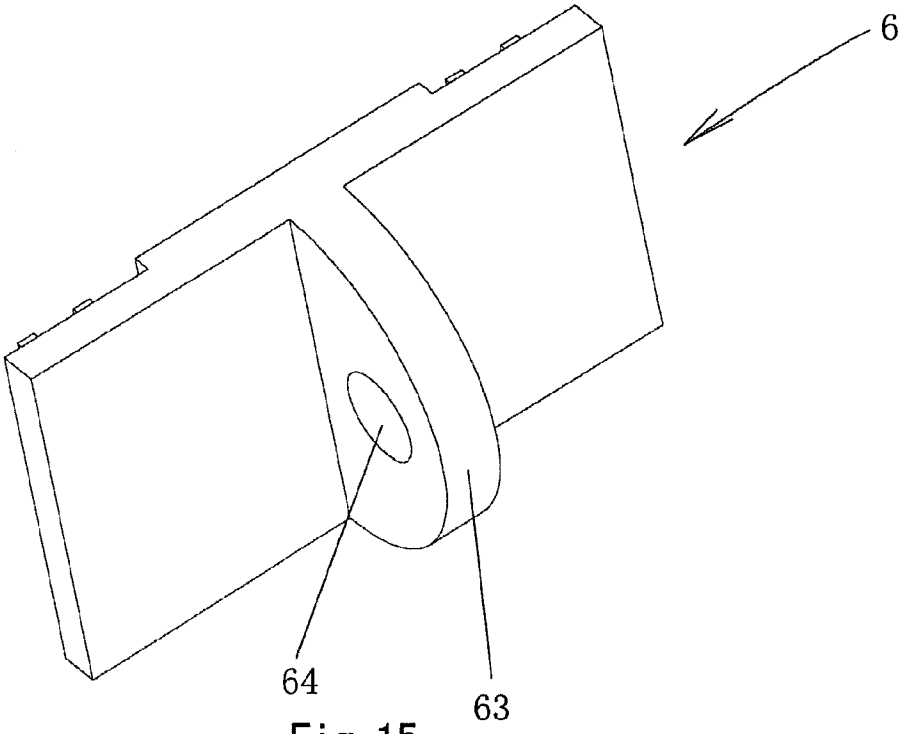


Fig. 15

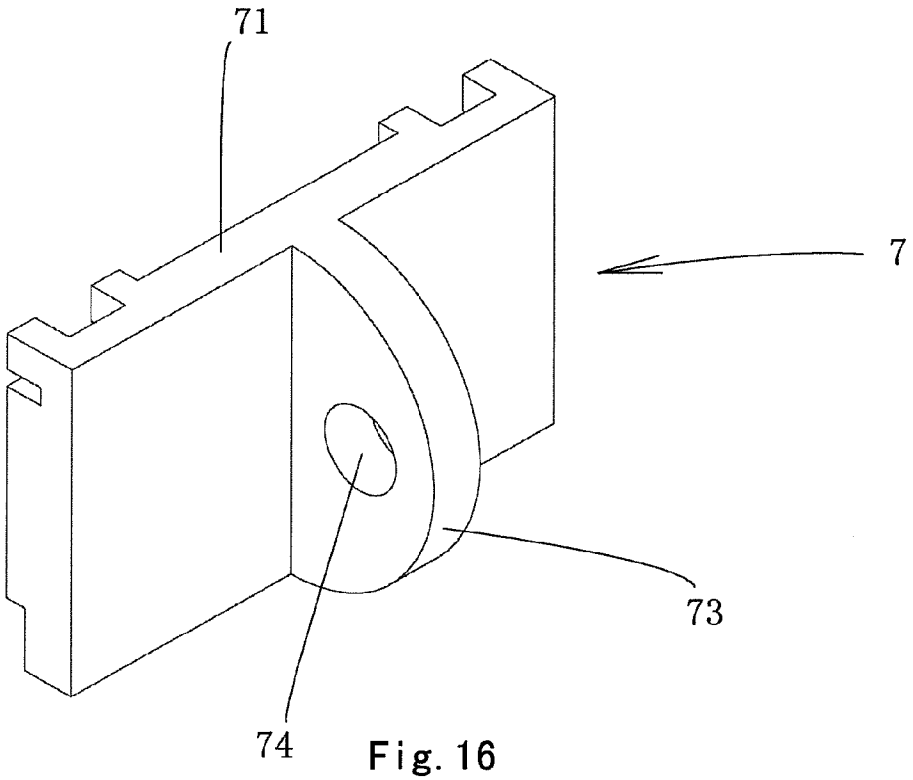


Fig. 16

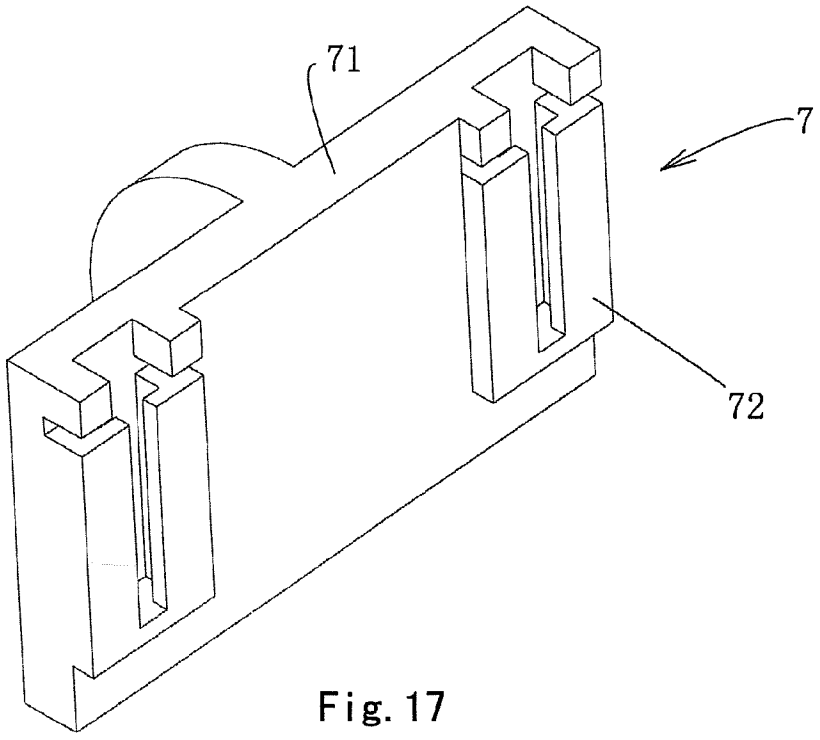


Fig. 17

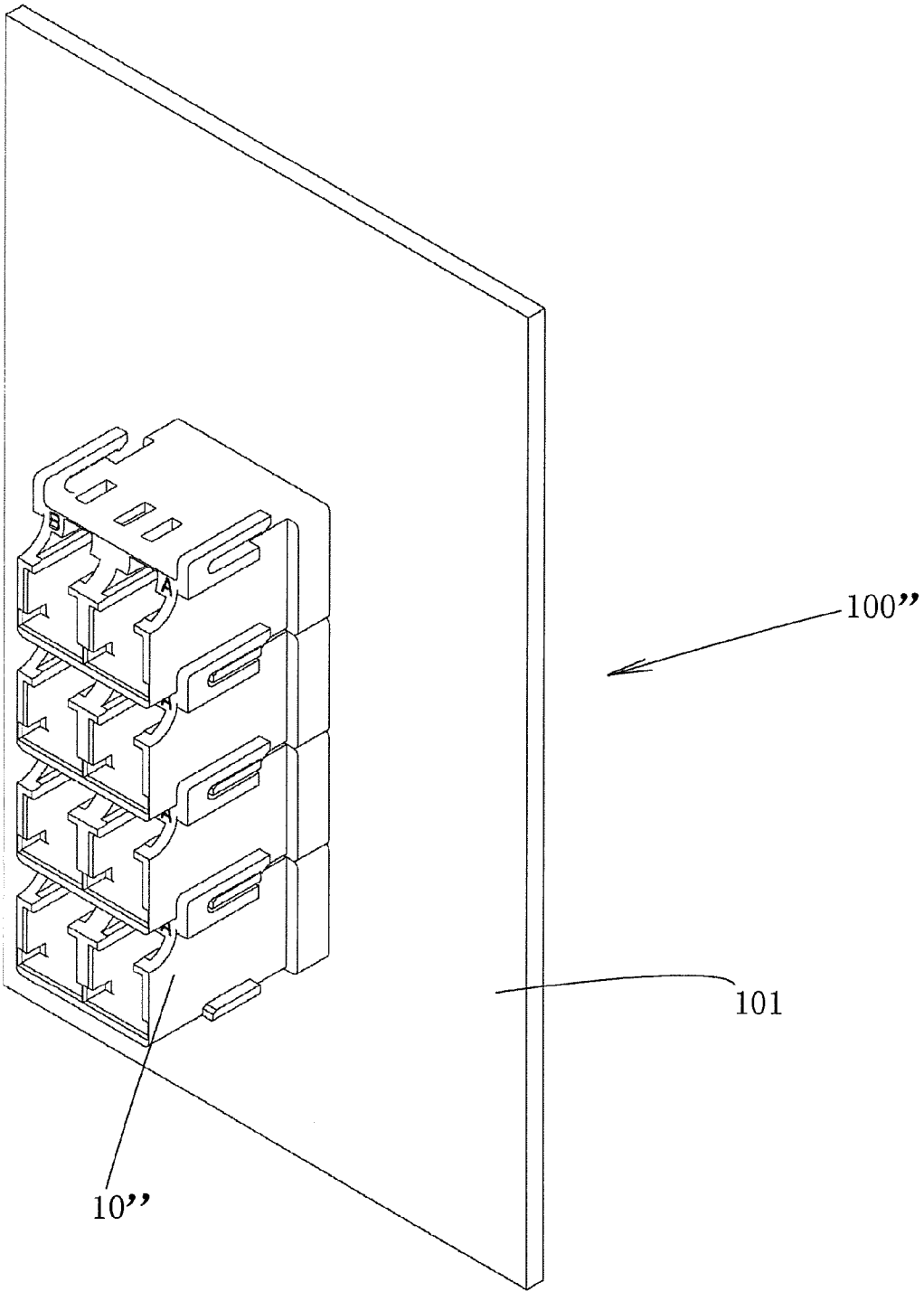


Fig. 18

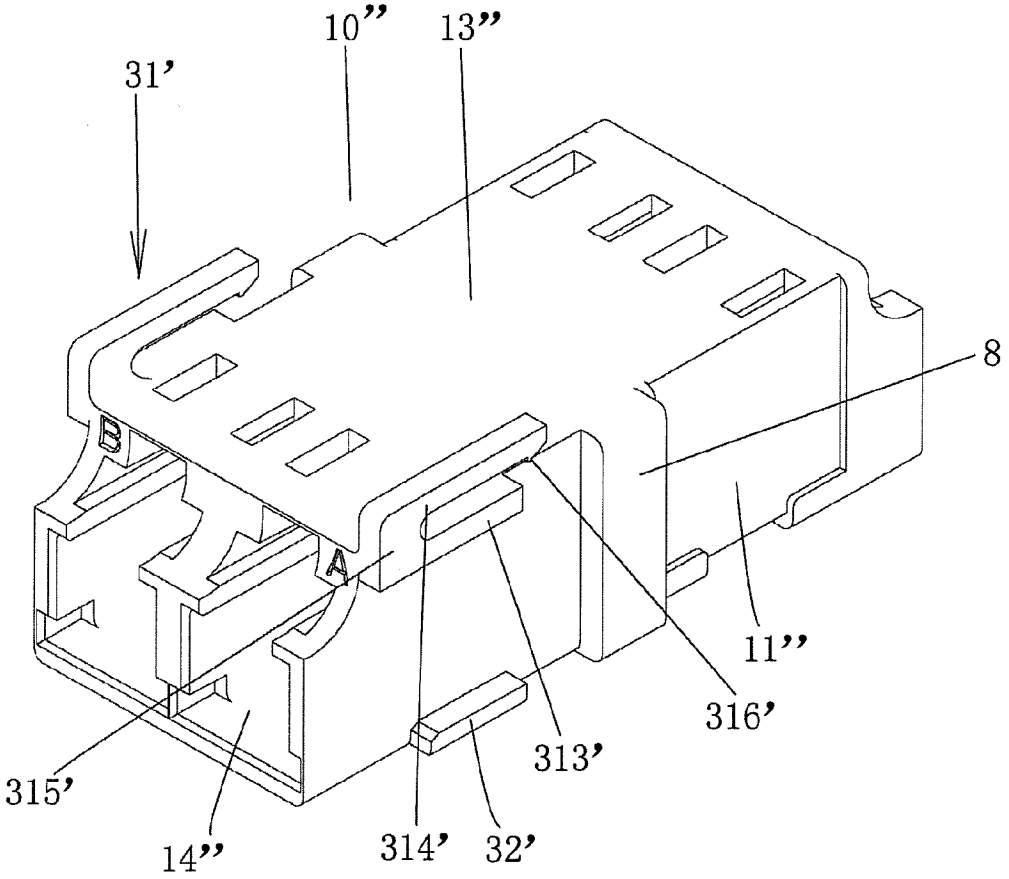


Fig. 19

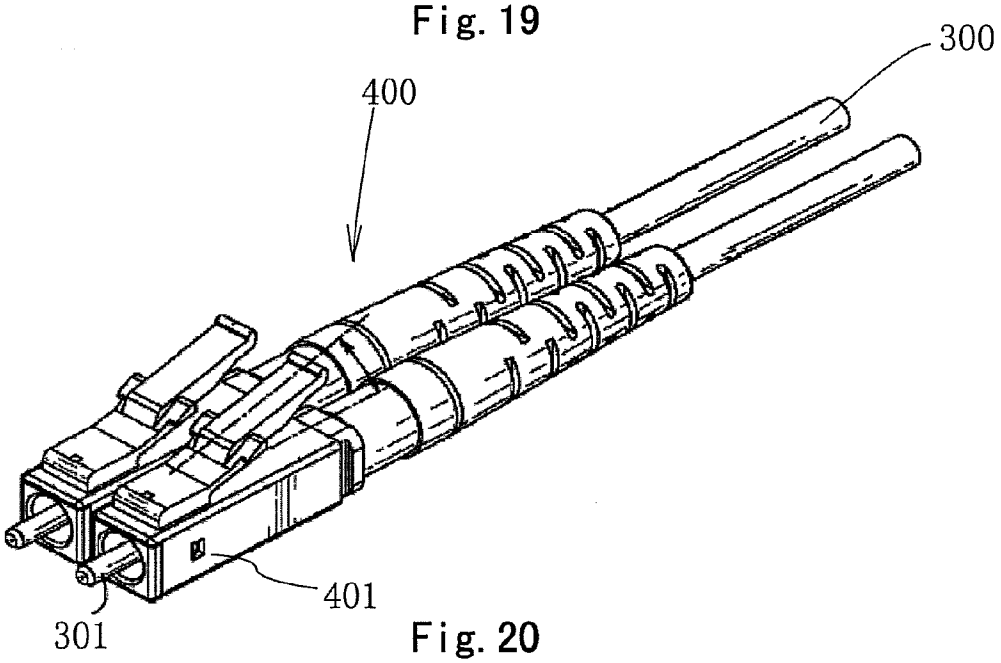


Fig. 20

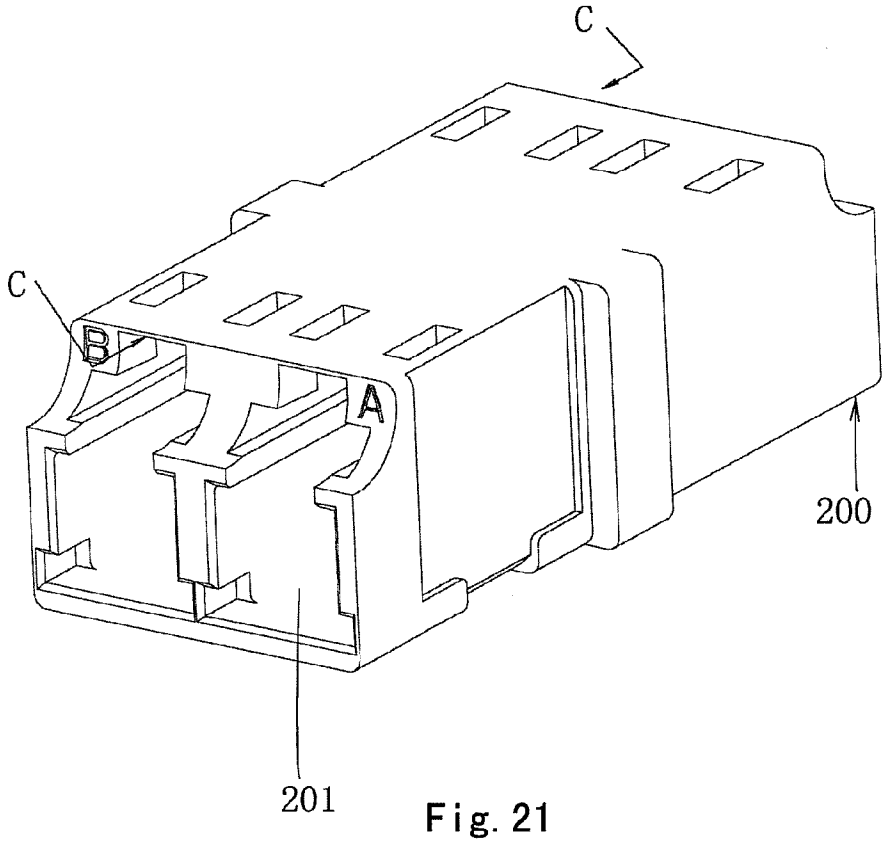


Fig. 21

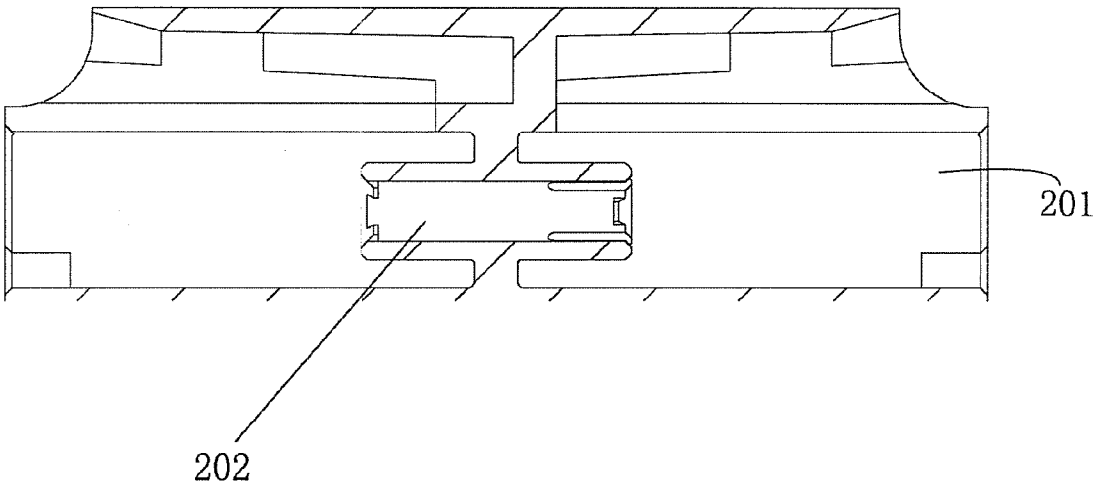


Fig. 22

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2013/054312

A. CLASSIFICATION OF SUBJECT MATTER
INV. H01R9/24 G02B6/00 H01R13/506 H01R13/508 H01R13/514
H01R31/06
ADD. H01R13/518 H01R13/74
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H01R G02B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2008/311781 A1 (WOJCIK ALAN F [US] ET AL) 18 December 2008 (2008-12-18)	1-6,25
Y	claims 1, 15 , 29 , 30 , 32 , 33 paragraph [0054] - paragraph [0056] figures 18-23	26

X	US 2001/049223 A1 (FUKATSU YUKIHIRO [JP]) 6 December 2001 (2001-12-06)	1,2, 9-16,25
Y	claims 1, 10	26
A	paragraph [0033] - paragraph [0035] paragraph [0038] figures 1, 2 , 7 -10	17

	-/--	

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
4 October 2013	16/10/2013

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Stichauer, Libor

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 215

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 319 071 B1 (SATO KEI [JP]) 20 November 2001 (2001-11-20)	1,2,9, 16, 20-22, 24,25
Y	column 4, line 24 - line 52 column 5, line 65 - column 6, line 8 column 6, line 50 - column 7, line 6 column 8, line 1 - line 10 figures 3,6, 9, 10, 13, 16	26

X	US 6 361 355 B1 (MATSUOKA YUTAKA [JP] ET AL) 26 March 2002 (2002-03-26)	1,2,9, 16, 20-22, 24,25
Y	column 5, line 19 - column 6, line 46 figures 1, 10	26

X	US 2006/228932 A1 (KOMIYAMA RYUICHI [JP]) 12 October 2006 (2006-10-12)	1,2,9, 16,25
Y	paragraph [0036] - paragraph [0039] paragraph [0041] figures 1, 2 , 3B, 4, 7, 8, 10, 11	26

X	US 2002/026710 A1 (MURAKAMI TAKAO [JP] ET AL) 7 March 2002 (2002-03-07)	1,2, 23-25
Y	claims 1 , 6 paragraph [0025] paragraph [0033] - paragraph [0037] figures	26

Y	US 2011/300745 A1 (FOLLINGSTAD MICHAEL JAY [US]) 8 December 2011 (2011-12-08)	26
A	paragraphs [0025], [0026], [0030], [0034], [0035] figures 1, 3 , 4 , 7 , 11, 13	1-3,7-9, 16-18,25

A	US 2009/221187 A1 (DALY PETER R [US] ET AL) 3 September 2009 (2009-09-03) figures 20-23	1-3,7-9, 16-18

A	US 2009/258536 A1 (LEE KUO-CHI [TW] ET AL) 15 October 2009 (2009-10-15) paragraph [0025] figures 1-3	1-3,7-9, 16-18

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 216

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2013/054312

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008311781 A1	18-12-2008	CN 101779344 A	14-07-2010
		EP 2168214 A2	31-03-2010
		JP 2010530121 A	02-09-2010
		US 2008311781 A1	18-12-2008
		US 2012190230 A1	26-07-2012
		US 2013252453 A1	26-09-2013
		WO 2008154626 A2	18-12-2008
US 2001049223 A1	06-12-2001	DE 60100639 D1	02-10-2003
		DE 60100639 T2	09-06-2004
		EP 1156553 A1	21-11-2001
		JP 3698250 B2	21-09-2005
		JP 2001326035 A	22-11-2001
		US 2001049223 A1	06-12-2001
US 6319071 B1	20-11-2001	JP 3530046 B2	24-05-2004
		JP 2000150055 A	30-05-2000
		US 6319071 B1	20-11-2001
US 6361355 B1	26-03-2002	AT 267473 T	15-06-2004
		CA 2300000 A1	03-09-2000
		DE 60010778 D1	24-06-2004
		DE 60010778 T2	07-10-2004
		EP 1033786 A2	06-09-2000
		ES 2220342 T3	16-12-2004
		JP 3701495 B2	28-09-2005
		JP 2000252003 A	14-09-2000
		US 6361355 B1	26-03-2002
US 2006228932 A1	12-10-2006	CN 1845381 A	11-10-2006
		EP 1710864 A2	11-10-2006
		JP 2006294386 A	26-10-2006
		US 2006228932 A1	12-10-2006
US 2002026710 A1	07-03-2002	JP 2001230038 A	24-08-2001
		US 2002026710 A1	07-03-2002
US 2011300745 A1	08-12-2011	AR 018435 A1	14-11-2001
		AR 026208 A1	29-01-2003
		AT 246851 T	15-08-2003
		AU 743265 B2	24-01-2002
		AU 4006099 A	20-12-1999
		BR 9910906 A	13-02-2001
		CA 2334152 A1	09-12-1999
		CN 1304569 A	18-07-2001
		CN 1725569 A	25-01-2006
		CO 5270031 A1	30-04-2003
		DE 69910204 D1	11-09-2003
		DE 69910204 T2	17-06-2004
		EP 1084523 A1	21-03-2001
		ES 2207219 T3	16-05-2004
		HK 1040572 A1	24-12-2003
		JP 2002517890 A	18-06-2002
		NZ 508811 A	28-02-2003
		PE 09072000 A1	14-09-2000
		TW 423184 B	21-02-2001
		US 6537106 B1	25-03-2003
		US 2003129871 A1	10-07-2003

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 217

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2013/054312

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 2005191901 A1	01-09-2005
		US 2006025011 A1	02-02-2006
		US 2006228940 A1	12-10-2006
		US 2008009182 A1	10-01-2008
		US 2009176404 A1	09-07-2009
		US 2011300745 A1	08-12-2011
		US 2012322299 A1	20-12-2012
		WO 9963628 A1	09-12-1999
US 2009221187 A1	03-09-2009	NONE	
US 2009258536 A1	15-10-2009	JP 3144088 U	14-08-2008
		TW M354883 U	11-04-2009
		US 2009258536 A1	15-10-2009

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 218

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

PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	17857300
Filing Date	2022-07-05
First Named Inventor	Hiep V. Nguyen
Art Unit	2874
Examiner Name	Omar R ROJAS
Attorney Docket Number	USCO-053-05

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
/ORR/	1	6764222	B1	2004-07-20	Szilagyi et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
/ORR/	1	20050135752	A1	2005-06-23	Kiani et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
/ORR/	1	2013100892	WO	A1	2013-07-04	Tsuzaki et al.		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

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

Receipt date: 09/13/2023

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17857300
	Filing Date	2022-07-05
	First Named Inventor	Hiep V. Nguyen
	Art Unit	2874
	Examiner Name	Omar R ROJAS
	Attorney Docket Number	USCO-053-05

	1		☐

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

EXAMINER SIGNATURE

Examiner Signature	/Omar R Rojas/	Date Considered	09/13/2023

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

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

PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	17857300
Filing Date	2022-07-05
First Named Inventor	Hiep V. Nguyen
Art Unit	2874
Examiner Name	Omar R ROJAS
Attorney Docket Number	USCO-053-05

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6764222	B1	2004-07-20	Szilagyi et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050135752	A1	2005-06-23	Kiani et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2013100892	WO	A1	2013-07-04	Tsuzaki et al.		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	17857300
	Filing Date	2022-07-05
	First Named Inventor	Hiep V. Nguyen
	Art Unit	2874
	Examiner Name	Omar R ROJAS
	Attorney Docket Number	USCO-053-05

	1		☐

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

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(**Not for submission under 37 CFR 1.99)**

Application Number	17857300
Filing Date	2022-07-05
First Named Inventor	Hiep V. Nguyen
Art Unit	2874
Examiner Name	Omar R ROJAS
Attorney Docket Number	USCO-053-05

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Michael L. Leetzow/	Date (YYYY-MM-DD)	2023-09-13
Name/Print	Michael L. Leetzow	Registration Number	35932

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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.**

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 record s.

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.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/857,300	**09/13/2023 07:30:53 AM ET**	**USCO-053-05**

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5557	FILED BY	Michael Leetzow
PATENT CENTER #	62785756	FILING DATE	07/05/2022
CUSTOMER #	152017	FIRST NAMED INVENTOR	Hiep V. Nguyen
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	-

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
IDS2_Form_20230912_USCO05305.pdf	4	Information Disclosure Statement (IDS) Form (SB08)	1252 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
IDS2_Form_20230912_USCO05305.pdf	C3D61E22DD98B2096ADF81F2055FACF75B5D5219D92236FB20A19693971164EC2BA5EE371B64011CB2CAE0BADDD4ABF392D80A82C767DEB9D8684B3796586DC4

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized

Senko Advanced Components v. US Conec Ltd.
Senko EX1025-A
Page 225

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 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/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	17857300
Filing Date	2022-07-05
First Named Inventor	Hiep V. Nguyen
Art Unit	2874
Examiner Name	Omar R ROJAS
Attorney Docket Number	USCO-053-05

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6764222	B1	2004-07-20	Szilagyi et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050135752	A1	2005-06-23	Kiani et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2013100892	WO	A1	2013-07-04	Tsuzaki et al.		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	17857300
	Filing Date	2022-07-05
	First Named Inventor	Hiep V. Nguyen
	Art Unit	2874
	Examiner Name	Omar R ROJAS
	Attorney Docket Number	USCO-053-05

	1		☐

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

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(**Not for submission under 37 CFR 1.99)**

Application Number	17857300
Filing Date	2022-07-05
First Named Inventor	Hiep V. Nguyen
Art Unit	2874
Examiner Name	Omar R ROJAS
Attorney Docket Number	USCO-053-05

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature		Date (YYYY-MM-DD)	
Name/Print	Michael L. Leetzow	Registration Number	35932

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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.**

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 record s.

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.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/857,300	**09/13/2023 07:14:19 AM ET**	**USCO-053-05**

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5557	FILED BY	Michael Leetzow
PATENT CENTER #	62785735	AUTHORIZED BY	-
CUSTOMER #	152017	FILING DATE	07/05/2022
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Hiep V. Nguyen

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 7852	**E20239C818328701**	**Michael Leetzow**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1806	SUBMISSION OF AN INFORMATION DISCLOSURE STATEMENT	260.00	1	260.00
			TOTAL AMOUNT:	**$260.00**

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 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.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
4 July 2013 (04.07.20 13)

W I P O | P C T

(10) International Publication Number
WO 2013/100892 A1

(51) International Patent Classification:
G02B 6/36 (2006.01)

(21) International Application Number:
PCT/US201 1/067336

(22) International Filing Date:
27 December 201 1 (27. 12.201 1)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant *(for all designated States except US)*: **YAZAKI CORPORATION** [JP/JP]; 4-28, Mita 1-chome, Minato-ku, Tokyo 108-8333 (JP).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **TSUZAKI, Nozomi** [JP/JP]; c/o Yazaki Corporation, 4th Floor of Asolty-Atsuginakacho Bldg, 9-14, Nakacho 4-chome, Atsugi-shi, Kanagawa 243-0018 (JP). **LAMPERT, Norman R.** [US/US]; P.O. Box 924016, Norcross, Georgia 30010-4016 (US).

(74) Agents: **GRUSKIN, Steven M.** et al; Sughrue Mion, PLLC, 2100 Pennsylvania Ave., N.W., Suite 800, Washington, District of Columbia 20037-3213 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

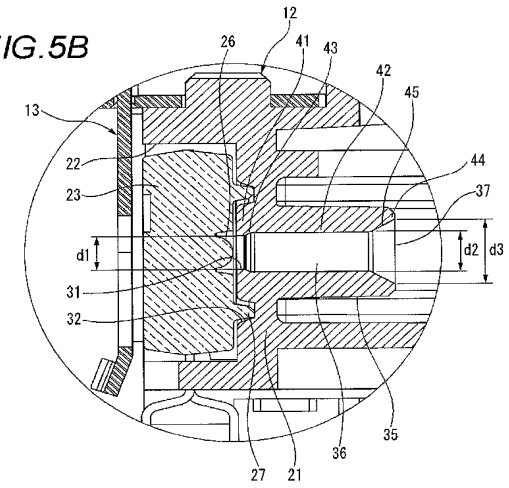
Published:

— *with international search report (Art. 21(3))*

WO 2013/100892 A1

(54) **Title:** OPTICAL MODULE

FIG.5B



(57) **Abstract:** An optical module includes: a fiber optic transceiver which includes a light-emitting/receiving surface for transmitting light with an optical fiber; and a housing which includes a holding portion which holds the fiber optic transceiver and a cylindrical portion which has a first opening facing on the light-emitting/receiving surface and a second opening from which the optical fiber is inserted. The cylindrical portion includes a first annular portion which forms the first opening of the cylindrical portion, a second annular portion which has an inner diameter larger than an inner diameter of the first annular portion, and a first interconnecting portion which interconnects edges of the first annular portion and the second annular portion having the different inner diameters. An optical module accepts an optical connector plug with plastic optical fiber without a ferrule; and glass optical fiber or smaller diameter plastic optical fiber both with a ferrule.

DESCRIPTION

Title of the Invention :

OPTICAL MODULE

Technical Field

[0001] The present invention relates to an optical module to which a plug attached to an optical fiber is coupled to thereby enable optical communication.

Background Art

[0002] There is an optical module of a receptacle type constituting a part of an optical connection which is configured to be mounted on a circuit board contained within a device. The optical module includes a housing having a fixing portion to be fixed to the circuit board, and a fiber optic transceiver (FOT: Fiber Optic Transceiver) having a light-emitting element or a light-receiving element (for example, see Patent Literature 1).

Citation List

Patent Literature

[0003] Patent Literature 1 : JP-A-2011-59183

Summary of Invention

Technical Problem

[0004] Some of the optical fibers have different configurations accorded to

their standards. Since an optical fiber accorded to one of the standards can not be coupled to an optical module dedicated to an optical fiber accorded to another standard, it is necessary to prepare an optical module dedicated to the one standard for the optical fiber accorded to the one standard. For example, it is necessary, as to a plastic optical fiber acceded to one standard, to prepare an optical module accorded to the configuration of the plastic optical fiber without a ferrule; and also as to an optical fiber made of glass or a smaller outside diameter (OD) plastic optical fiber both with a ferrule, to prepare an optical module accorded to the configuration of a ferrule to be assembled to the glass optical fiber or a smaller OD plastic optical fiber. Thus, there arises a problem that the model number of the optical module increases.

[0005] The present invention has been made in view of the circumstances and an object of the present invention is to provide an optical module which can be coupled to a plurality of optical fibers accorded to different standards.

Solution to Problem

[0006] In order to attain the object, an optical module according to each aspect of the present invention is configured by any one of the following configurations (1) to (6).

(1) An optical module, including:

a fiber optic transceiver which includes a light-emitting/receiving surface for transmitting light with an optical fiber; and

a housing which includes a holding portion which holds the fiber optic transceiver and a cylindrical portion which has a first opening facing on the

light-emitting/receiving surface and a second opening from which the optical fiber is inserted, wherein

the cylindrical portion includes a first annular portion which forms the first opening of the cylindrical portion, a second annular portion which has an inner diameter larger than an inner diameter of the first annular portion, and a first interconnecting portion which interconnects edges of the first annular portion and the second annular portion having the different inner diameters.

(2) The optical module according to the configuration (1), wherein the first interconnecting portion has a slanted surface.

(3) The optical module according to the configuration (1) or (2), wherein

the cylindrical portion further includes a third annular portion which forms the second opening of the cylindrical portion and has an inner diameter larger than the inner diameter of the second annular portion, and a second interconnecting portion which interconnects edges of the second annular portion and the third annular portion having the different inner diameters.

(4) The optical module according to the configuration (3), wherein the second interconnecting portion has a slanted surface.

(5) The optical module according to any one of the configurations (1) to (4), wherein

the optical fiber to be inserted in the cylindrical portion of the housing includes a plastic optical fiber, and a glass optical fiber which is provided with a ferrule at an end part of the glass optical fiber or a smaller

outside diameter plastic optical fiber which is provided with a ferrule at an end part of the smaller outside diameter plastic optical fiber, and

the inner diameter of the first annular portion is slightly larger than an outer diameter of the plastic optical fiber and smaller than an outer diameter of the ferrule, and the inner diameter of the second annular portion is larger than the outer diameter of the ferrule.

(6) The optical module according to the configuration (5), wherein

an end of the ferrule has a tapered portion which abuts the first interconnecting portion when inserted in the cylindrical portion so that the first interconnecting portion prevents the end of the ferrule from being in contact with the light-emitting/receiving surface of the fiber optic transceiver.

[0007] According to the optical module in the configuration (l), the first annular portion has a cylindrical shape accorded to the shape of one type of the optical fiber. Further, the second annular portion has a cylindrical shape accorded to the shape of another type of the optical fiber. The first interconnecting portion interconnects the first and second annular portions. Thus, in the case of coupling each of the optical fibers with the different standards to the optical module, the single optical module can cope with these optical fibers and so can be coupled to each of these optical fibers of the different standards with good transmission characteristics.

Further, the first interconnecting portion guides the tip end of the one type of the optical fiber without ferrule to the first annular portion at the time of inserting the optical fiber into the cylindrical portion. Thus, the assembling procedure at the time of coupling the optical fiber to the optical

module can be facilitated.

According to the optical module in the configuration (2), the slanted surface of the first interconnecting portion serves as a guide for the one type of the optical fiber and also serves as a stopper for the other type of the optical fiber. Thus, in the case of coupling each of the optical fibers with the different standards to the optical module, the single optical module can cope with these optical fibers and so can be coupled to each of these optical fibers of the different standards with good transmission characteristics. Further, the assembling properties can be enhanced.

According to the optical module in the configuration (3), the tip end of the optical fiber is guided by the second interconnecting portion, whereby the assembling properties can be enhanced.

According to the optical module in the configuration (4), the slanted surface of the second interconnecting portion serves as a guide for the optical fibers, whereby the assembling properties can be enhanced.

According to the optical module in the configuration (5), the first annular portion has a cylindrical shape accorded to the shape of the plastic optical fiber. Further, the first interconnecting portion forms a slanted surface, for example, and the second annular portion has a cylindrical shape accorded to the shape of a ferrule attached to the glass optical fiber or smaller OD plastic optical fiber, both of which use a ferrule. Thus, in the case of coupling each of the optical fibers with the different standards to the optical module, the single optical module can cope with these optical fibers and so can be coupled to each of these optical fibers of the different standards with good transmission characteristics.

According to the optical module in the configuration (6), the first interconnecting portion prevents the end of the ferrule attached to the glass optical fiber from being contact with the light-emitting/receiving surface of the fiber optic transceiver. Thus, even when the optical module copes with the plurality of optical fibers accorded to different standards such as a plastic optical fiber and a glass optical fiber or smaller OD plastic optical fiber, the light-emitting/receiving surface of the fiber optic transceiver is not damaged with the end of the ferrule attached to the glass optical fiber.

Advantageous Effects of Invention

[0008] According to the invention, an optical module capable of coupling with a plurality of optical fibers accorded to different standards can be provided.

[0009] The invention is explained briefly. The details of the invention will be further made clear by reading an embodiment of the invention explained below with reference to drawings.

Brief Description of Drawings

[00 10] Fig. 1 is a perspective view of an optical module according to an embodiment of the invention.

Fig. 2 is a perspective view of the optical module according to the embodiment of the invention seen from a side of an optical port portion.

Fig. 3 is a front view of the optical module according to the embodiment of the invention seen from the side of the optical port portion.

Fig. 4 is a perspective view of the optical module seen from a side of a

holding portion of a housing.

Fig. 5A is a sectional view showing the inner configuration of the optical module.

Fig. 5B is an enlarged sectional view of a part VB in Fig. 5A.

Fig. 6A is a sectional view of the optical module to which an optical fiber made of plastics is coupled.

Fig. 6B is an enlarged sectional view of a part VIB in Fig. 6A.

Fig. 7A is a sectional view of the optical module to which an optical fiber made of glass or small OD plastic optical fiber, of which both use a ferrule, is coupled.

Fig. 7B is an enlarged sectional view of a part VIIB in Fig. 7A.

Fig. 8 is a perspective view of the optical module according to a modified example seen from an optical port portion side.

Description of Embodiments

[0011] Hereinafter, an embodiment of the invention will be explained with reference to drawings.

[0012] Fig. 1 is a perspective view of an optical module according to the embodiment of the invention, Fig. 2 is a perspective view of the optical module according to the embodiment of the invention seen from a side of an optical port portion, Fig. 3 is a front view of the optical module according to the embodiment of the invention seen from the side of the optical port portion, Fig. 4 is a perspective view of the optical module seen from a side of a holding portion of a housing, Fig. 5A is a sectional view showing the inner configuration of the optical module and Fig. 5B is an enlarged sectional view

of a part VB in Fig. 5A.

[0013] As shown in Figs. 1 and 2, an optical module 11 according to the embodiment is an optical receptacle constituting a part of an optical connection used for the optical communication for the OA (Office Automation), the FA (Factory Automation) or a vehicle-mounted device etc., for example. The optical module 11 is mounted on a circuit board contained within each of various kinds of devices and includes a housing 12 formed by resin and a shield casing 13 made of metal attached to the one end side of the housing 12.

[0014] As shown in Fig. 3, an optical port portion 14 is formed on the other end side of the housing 12, and an optical plug is inserted into and withdrawn from the optical port portion 14.

[0015] The shield casing 13 includes a front plate portion 13a and side plate portions 13b provided on both the side portions of the front plate portion 13a and is formed in a U-shape in its plan view. Thus, when the shield casing 13 is attached to the housing 12, the shield casing 13 covers the one end and the both side portions on the one end side of the housing 12. Further, in the shield casing 13, a terminal portion 13c extending to the downward side is formed at each of the potions 13b.

[0016] As shown in Figs. 4, 5A and 5B, a partition wall 21 for partitioning the one end side and the other end side is formed in the housing 12.

[0017] The housing 12 has two holding portions 22 each formed in a concave shape on the one end side. An FOT (Fiber Optic Transceiver) 23 as a fiber optic transceiver having a light-emitting element or a light-receiving element is attached to each of the holding portions 22. The FOT 23 has an

element main body 24 and a plurality of leads 25 extended from the element main body 24. In each of the holding portions 22, a notch portion 22a is formed on the downward side of the housing 12 and the leads 25 of the FOT 23 are drawn from the notch portion 22a to the downward side of the housing 12.

[0018] Each of the FOTs 23 is provided with a light reception/emission surface 26 formed in a semispherical shape at the center of the one side surface of the element main body 24. The light reception/emission surface 26 acts as the light emission surface for emitting an optical signal when the FOT 23 includes a light-emitting element, whilst the light reception/emission surface 26 acts as the light reception surface for receiving an optical signal when the FOT 23 includes a light-receiving element.

[0019] In the FOT 23, an annular projection 27 is formed around the light reception/emission surface 26 on the one side surface of the element main body 24 where the light reception/emission surface 26 is provided.

[0020] An opening 31 is formed at the partition wall 21. An annular groove portion 32 is formed around the opening 31 on the surface of the holding portion 22 of the partition wall 21. The annular projection 27 of the FOT 23 to be received within the holding portion 22 is fit into the annular groove portion 32. When the projection 27 is fit into the groove portion 32, the light reception/emission surface 26 of the FOT 23 is disposed so as to be positioned at a position facing on the opening 31. The FOT 23 thus attached to and received within the holding portion 22 of the housing 12 is covered by the shield casing 13 attached to the housing 12.

[0021] In the housing 12, a cylindrical portion 35 protruding on a side of the

optical port portion 14 is formed at the partition wall 21. The cylindrical portion 35 has an insertion hole 36 at the center thereof. One of the openings on the side of the holding portion 22 of the insertion hole 36 is formed as the opening (or first opening) 31 facing on the light reception/emission surface 26 of the FOT 23. The other opening on the opposite side of the insertion hole 36 is formed as an opening (or second opening) 37 from which the optical fiber is inserted.

[0022] The one opening 31 side of the cylindrical portion 35 is formed as a first annular portion 41 having an inner diameter d1 slightly larger than the outer diameter of a plastic optical fiber 51 described later. A second annular portion 42 having an inner diameter d2 larger than the inner diameter d1 of the first annular portion 41 is provided on the other opening 37 side of the cylindrical portion 35. Further, the cylindrical portion 35 has a first interconnecting portion 43 for interconnecting the first annular portion 41 and the second annular portion 42 having the different inner diameters.

[0023] A portion forming the other opening 37 of the cylindrical portion 35 is configured as a third annular portion 44 having an inner diameter d3 larger than the inner diameter d2 of the second annular portion 42. A portion for interconnecting the second annular portion 42 and the third annular portion 44 having the different inner diameters is formed as a second interconnecting portion 45. Each of the first interconnecting portion 43 and the second interconnecting portion 45 is configured to have a tapered shape having an inner diameter reducing toward the FOT 23 side.

[0024] The optical module 11 is mounted on the circuit board within which various kinds of devices are contained. The terminal portions 13c of the

shield casing 13 and the leads 25 of the FOT 23 are inserted into through holes of the circuit board, then soldered and hence electrically coupled to a conductive pattern. The terminal portions 13c of the shield casing 13 are electrically coupled to the conduction pattern as the ground of the circuit board.

[0025] In the optical module 11, optical plugs having optical fibers of the different standards can be coupled to the optical port portion 14. The optical fibers of the different standards include a plastic optical fiber made of plastics and a glass optical fiber made of glass, for example. The plastic optical fiber is excellent in the noise withstanding properties and is a plastic optical fiber (POF), core and clad of which are made of plastics. The glass optical fiber includes one type in which core and clad are each made of glass and a hard polymer clad fiber (HPCF) in which core and clad are respectively made of glass and plastics. The glass optical fiber or smaller OD plastic optical fiber are provided and coupled with a ferrule at the end part including a tip thereof.

[0026] The optical transmission between the FOT 23 and the light reception/emission surface 26 is made possible by coupling the plastic optical fiber or the glass optical fiber to the optical module 11. Further, in the optical module 11, since the FOT 23 attached to and received within the holding portion 22 of the housing 12 is covered by the shield casing 13, good signal transmission can be realized whilst suppressing the influence of electromagnetic noise.

[0027] Next, the explanation will be made as to a case of coupling the plastic optical fiber without a ferrule and the glass optical fiber or smaller OD

plastic optical fiber both with a ferrule to the optical module 11.

[0028] (Coupling with Plastic Optical Fiber without Ferrule)

As shown in Figs. 6A and 6B, a pre-assembled optical plug 61 is attached to an end portion of the plastic optical fiber 51. The plastic optical fiber 51 is covered by a sheath 53 to thereby form an optical cable. The plastic optical fiber 51 is exposed from the sheath 53 at the end portion thereof. The optical plug 61 attached to the end portion of the plastic optical fiber 51 has a housing 63 provided with an insertion hole 62 which opens at the rear end thereof. The plastic optical fiber 51 is inserted into the strength member 67 which is press-fit into insertion hole 62 of the housing 63. In the nature of the plastic optical fiber 51, it is preferable that the tip of the plastic optical fiber 51 is close to or contact with the light-emitting/receiving surface 26 of the FOT 23.

[0029] The insertion hole 62 has a guide portion 64 having its diameter reducing gradually toward the end thereof. The plastic optical fiber 51 inserted into the strength member 67 which is press-fit into insertion hole 62 and is guided toward the center by the guide portion 64. An engagement hole 65 having an inner diameter slightly larger than the outer of the plastic optical fiber 51 is formed closer to the end side than the guide portion 64. The plastic optical fiber 51 guided by the guide portion 64 is inserted into the engagement hole 65. An engagement hole portion 66 having an inner diameter slightly larger than an outer diameter of the cylindrical portion 35 of the optical module 11 is formed at the end of the optical plug 61.

[0030] A latch portion 68 is formed at the housing 63 of the optical plug 61. When the optical plug 61 is inserted into and coupled with the optical port

portion 14 of the optical module 11, the latch portion 68 engages with the housing 12 of the optical module 11 and maintains the coupling state.

[0031] The portion of the plastic optical fiber 51 exposed from the sheath 53 is inserted into the insertion hole 62, then guided toward the center by the guide portion 64 and pushed into the engagement hole 65. Then, the plastic optical fiber 51 is protruded on the engagement hole portion 66 side from the engagement hole 65 and further protruded from the tip end surface of the optical plug 61, whereby the end surface 51a thereof is disposed at a predetermined position from the tip end surface of the optical plug 61.

[0032] The metal strength member 67 is press-fitted into the insertion hole 62 of the optical plug 61. The strength member 67 is fixed with a pressure crimp at section 67a of the strength member 67 to fix the end portion of the sheath 53.

[0033] When the optical plug 61 is inserted into the optical port portion 14 of the optical module 11, the end portion of the plastic optical fiber 51 is inserted from the opening 37 into the second annular portion 42 of the cylindrical portion 35 of the optical module 11. In this case, the end portion of the plastic optical fiber 51 is smoothly guided to the second annular portion 42 by the taper- shaped second interconnecting portion 45.

[0034] When the optical plug 61 is further inserted into the optical port portion 14 of the optical module 11, the cylindrical portion 35 is fit into the engagement hole portion 66 of the optical plug 61.

[0035] Thereafter, the end portion of the plastic optical fiber 51 is inserted into the first annular portion 41 of the cylindrical portion 35 of the optical module 11. In this case, the end portion of the plastic optical fiber 51 is

smoothly guided to the first annular portion 41 by the taper-shaped first interconnecting portion 43 and is aligned at its center. Thus, the end surface 51a of the plastic optical fiber 51 is disposed at the opening 31, whereby the end surface 51a is disposed at a close position or a contact position so as to oppose to the light reception/emission surface 26 of the FOT 23.

[0036] Thus, the optical module 11 is placed in a state that good optical transmission can be realized between the plastic optical fiber 51 and the light reception/emission surface 26 of the FOT 23.

[0037] In this state, the latch portion 68 of the optical plug 61 engages with the housing 12 of the optical module 11 to thereby maintain the coupling state of the optical plug 61 to the optical module 11.

[0038] (Coupling with Glass Optical Fiber with Ferrule or Plastic Optical Fiber with Ferrule)

As shown in Figs. 7A and 7B, also when the glass optical fiber 55 is to be used, the optical plug 61 is attached to the end portion of the glass optical fiber 55. The glass optical fiber 55 is covered by a buffer 56 to thereby form part of an optical cable. The glass optical fiber 55 is exposed from the buffer 56 at the end portion thereof. In the nature of the glass optical fiber 55, it is necessary to adopt the configuration in which the direct contact force is avoided between the tip of the glass optical fiber 55 (and a ferrule 71) and the light-emitting/receiving surface 26 of the FOT 23.

[0039] The optical plug 61 includes a ferrule 71 that is press-fit or made as a part of a flange 69, and a compression spring 70 to urge the ferrule 71 forward. The ferrule 71 is typically made of zirconia ceramic, plastic, or

metal. The ferrule 71 and the flange 69 are sometimes made as one part. The front end of the compression spring 70 abuts the flange 69 and the back end of the compression spring 70 abuts the front end of the strength member 67 which is press-fit into a housing of the optical plug 61.

[0040] Epoxy adhesive, for example, is injected into a capillary hole 73 of the ferrule 71 and the flange 69. The capillary hole 73 is formed around the longitudinal axis of the ferrule 71. The portion of the glass optical fiber 55 exposed from the buffer 56 is inserted into capillary hole 73 of the ferrule 71. The buffer 56 is at the same time inserted into the flange 69, and the epoxy adhesive is cured. The excess fiber outside of the end face of the ferrule 71 is cut; and the end face is polished to a high level finish. The glass optical fiber 55 is therefore attached inside the ferrule 71. The ferrule 71 has an outer diameter larger than the inner diameter d1 (see Fig. 5B) of the first annular portion 41 and smaller than the inner diameter d2 (see Fig. 5B) of the second annular portion 42. The peripheral edge at the tip end portion of the ferrule is configured as a tapered portion 72 having an inner diameter reducing gradually toward the tip end thereof. In the ferrule 71, the end surface 71a thereof is protruded from the tip end surface of the optical plug 61 and disposed at a predetermined position from the tip end surface of the optical plug 61.

[0041] When the optical plug 61 is inserted into the optical port portion 14 of the optical module 11, the end portion of the ferrule 71 attached to the glass optical fiber 55 is inserted from the opening 37 into the second annular portion 42 of the cylindrical portion 35 of the optical module 11. In this case, the end portion of the ferrule 71 is smoothly guided to the second annular

portion 42 by the taper-shaped second interconnecting portion 45.

[0042] When the optical plug 61 is further inserted into the optical port portion 14 of the optical module 11, the cylindrical portion 35 is fit into the engagement hole portion 66 of the optical plug 61.

[0043] Thereafter, when the tapered portion 72 formed at the end portion of the ferrule 71 abuts against the first interconnecting portion 43, the ferrule 71 is aligned at its center and the movement of the ferrule 71 in the insertion direction is restricted. That is, the first interconnecting portion 43 prevents the end portion of the ferrule 71 from being contact with the light-emitting/receiving surface 26 of the FOT 23. Thus, the end surface 71a of the ferrule 71 is disposed at the opening 31, whereby the end surface is disposed at a close position so as to oppose to the light reception/emission surface 26 of the FOT 23.

[0044] Thus, the optical module 11 is placed in a state that good optical transmission can be realized between the glass optical fiber 55 and the light reception/emission surface 26 of the FOT 23.

[0045] In this state, the latch portion 68 of the optical plug 61 engages with the housing 12 of the optical module 11 and is fixed at the mechanical plane MP (shown in Fig. 5A) to thereby maintain the coupling state of the optical plug 61 to the optical module 11.

[0046] Although the description is made as to the glass optical fiber 55 which is provided with the ferrule 71, the optical module 11 can accept another plastic optical fiber which is provided with a ferrule. When a smaller outside diameter (OD) plastic optical fiber rather than the plastic optical fiber 51 is used, it is usual to attach a ferrule at the end part of the

smaller OD plastic optical fiber. In this case, the smaller OD plastic optical fiber with the ferrule is received in the optical module 11, in the different way from receiving the plastic optical fiber 51 without a ferrule shown in Figs. 6A and 6B, but rather in the same way as receiving the glass optical fiber 55 with the ferrule 71, as shown in Figs. 7A and 7B.

[0047] As explained above, according to the optical module of this embodiment, the first annular portion 41 has a cylindrical shape accorded to the shape of the plastic optical fiber 51. Further, the first interconnecting portion 43 has the slanted surface against where the tip end of the ferrule 71 having a diameter reducing toward the tip abuts and the second annular portion 42 has a cylindrical shape accorded to the shape of the ferrule 71. Thus, in the case of coupling the optical module 11 to each of the plastic optical fiber 51, and the glass optical fiber 55 having the ferrule 71 or the smaller OD plastic optical fiber having the ferrule with the different standards, the single optical module 11 can cope with these optical fibers and so can be coupled to each of these optical fibers of the different standards with good transmission characteristics.

[0048] In general, an optical module is not configured to be connectable to both the plastic optical fiber 51, and the glass optical fiber 55 attached to the ferrule 71 or the smaller OD plastic optical fiber with ferrule having the different standards. This is because the suitable distance between the end surface of the optical fiber and the light reception/emission surface 26 of the FOT 23 differs between these optical fibers depending on the type of the optical fiber. Thus, the plastic optical fiber 51 and the glass optical fiber 55 or the smaller OD plastic optical fiber with ferrule are coupled to different

optical modules having different structures, respectively.

[0049] In contrast, according to the optical module 11 of this embodiment, the positions of the end surfaces of the optical fibers of the different standards can be disposed at the positions separated by the suitable distances with respect to the light reception/emission surface 26 of the FOT 23 according to the position of the first annular portion 41 and the shape of the first interconnecting portion 43. Thus, the single optical module 11 can cope with the optical fibers of the different standards and can be coupled to these optical fibers with good transmission characteristics.

[0050] The first interconnecting portion 43 guides the tip end of the plastic optical fiber 51 to the first annular portion 41 at the time of inserting the plastic optical fiber 51 into the cylindrical portion 35. Thus, the assembling procedure at the time of coupling the plastic optical fiber 51 to the optical module 11 can be facilitated.

[0051] Further, the tip end of the plastic optical fiber 51 or the tip end of the ferrule 71 is guided by the second interconnecting portion 45, whereby the assembling properties can be enhanced.

[0052] Although the optical module 11 according to the embodiment is configured that the FOT 23 is covered by the shield casing 13 as the countermeasure to the electromagnetic noise, the optical module may be configured in a manner that, as shown in Fig. 8, a casing 81 made of resin is part of housing 12 to thereby cover the FOT 23 attached to and received within the holding portion 22 of the housing 12 in the casing 81.

[0053] The invention is not limited to the aforesaid embodiment and may be suitably modified and improved, for example. The material, shape, size,

number, disposed position etc. of each of the constituent elements of the aforesaid embodiment are not limited thereto and may be arbitrary so long as the invention is attained.

CLAIMS

1. An optical module, comprising:

a fiber optic transceiver which includes a light-emitting/receiving surface for transmitting light with an optical fiber; and

a housing which includes a holding portion which holds the fiber optic transceiver and a cylindrical portion which has a first opening facing on the light-emitting/receiving surface and a second opening from which the optical fiber is inserted, wherein

the cylindrical portion includes a first annular portion which forms the first opening of the cylindrical portion, a second annular portion which has an inner diameter larger than an inner diameter of the first annular portion, and a first interconnecting portion which interconnects edges of the first annular portion and the second annular portion having the different inner diameters.

2. The optical module according to claim 1, wherein

the first interconnecting portion has a slanted surface.

3. The optical module according to claim 1 or 2, wherein

the cylindrical portion further includes a third annular portion which forms the second opening of the cylindrical portion and has an inner diameter larger than the inner diameter of the second annular portion, and a second interconnecting portion which interconnects edges of the second annular portion and the third annular portion having the different inner

diameters.

4. The optical module according to claim 3, wherein

the second interconnecting portion has a slanted surface.

5. The optical module according to any one of claims 1 to 4, wherein

the optical fiber to be inserted in the cylindrical portion of the housing includes a plastic optical fiber, and a glass optical fiber which is provided with a ferrule at an end part of the glass optical fiber or a smaller outside diameter plastic optical fiber which is provided with a ferrule at an end part of the smaller outside diameter plastic optical fiber, and

the inner diameter of the first annular portion is slightly larger than an outer diameter of the plastic optical fiber and smaller than an outer diameter of the ferrule, and the inner diameter of the second annular portion is larger than the outer diameter of the ferrule.

6. The optical module according to claim 5, wherein

an end of the ferrule has a tapered portion which abuts the first interconnecting portion when inserted in the cylindrical portion so that the first interconnecting portion prevents the end of the ferrule from being in contact with the light-emitting/receiving surface of the fiber optic transceiver.

FIG.1

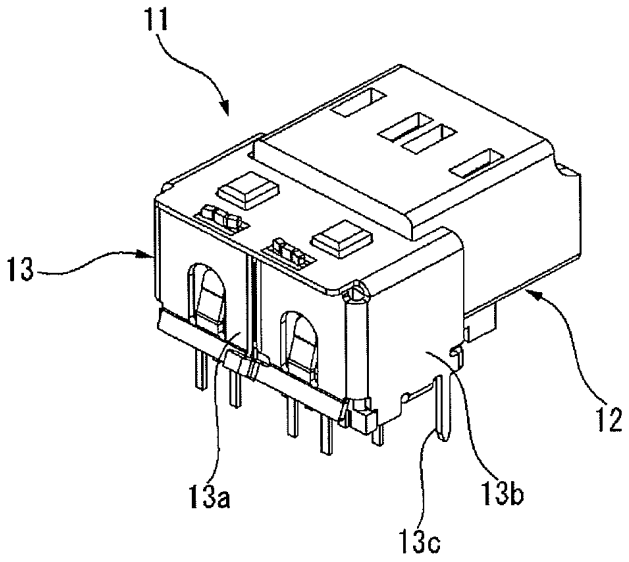


FIG.2

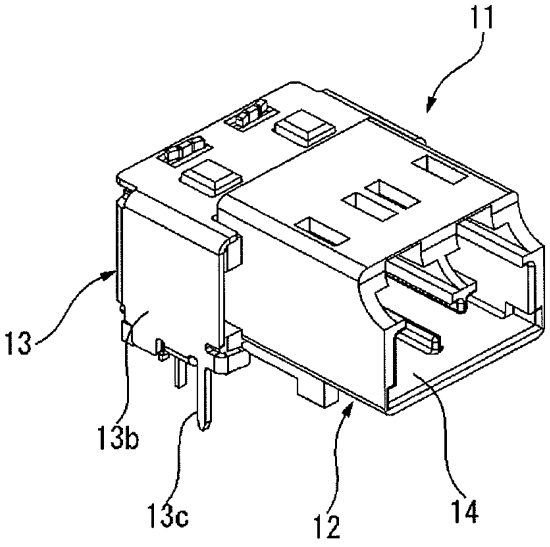


FIG.3

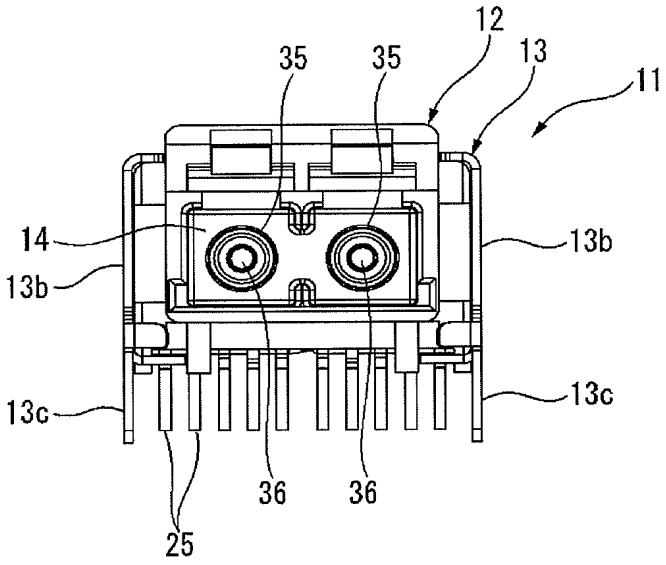


FIG.4

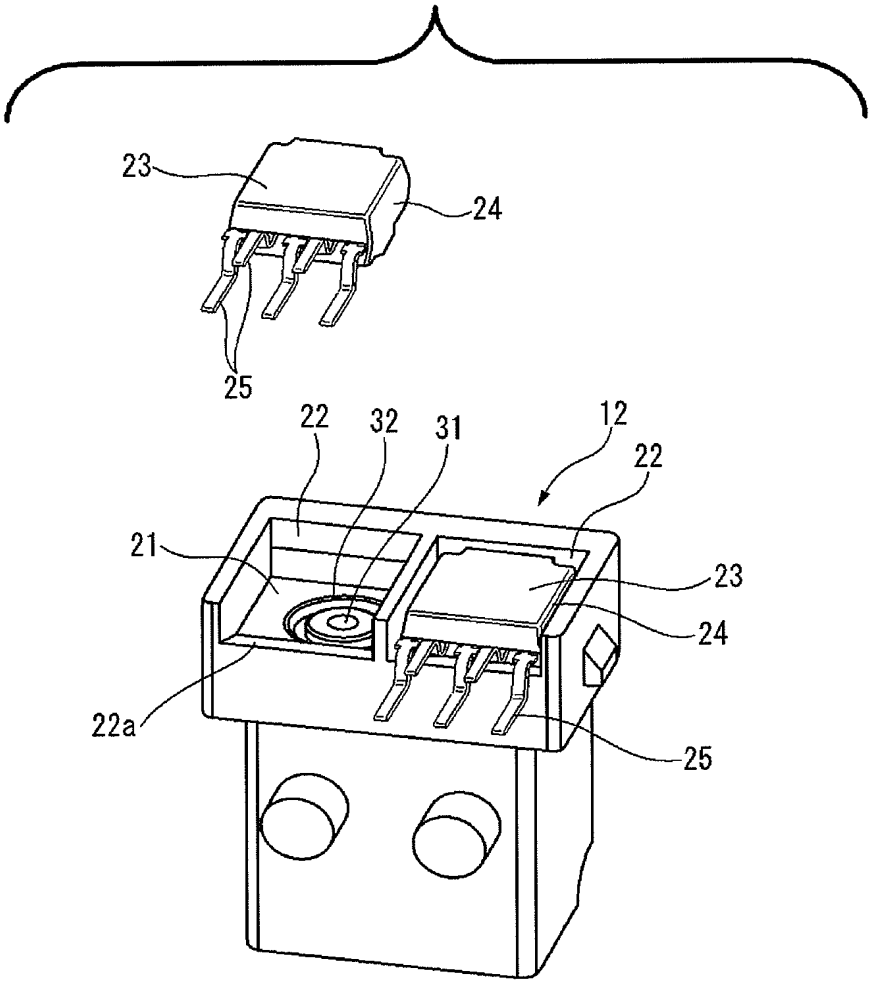


FIG.5A

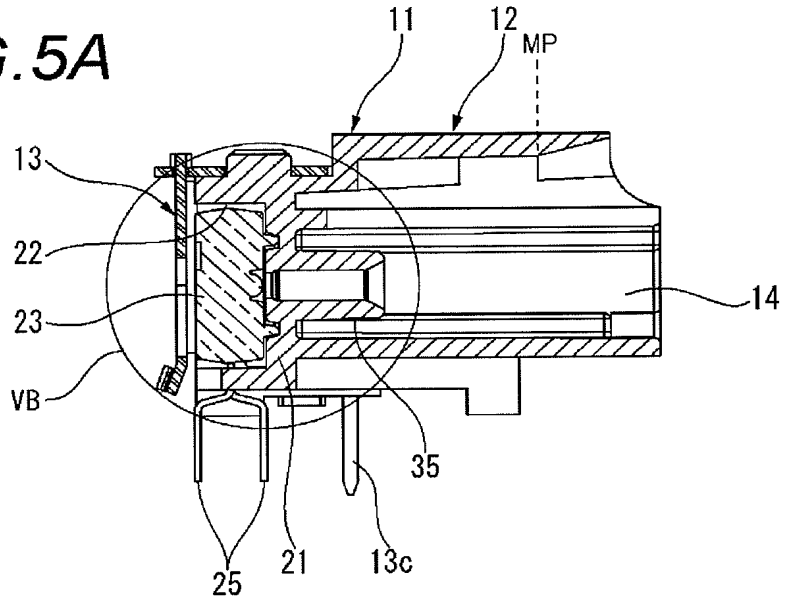

11
12
MP
13
22
23
VB
14
35
25
21
13c

FIG.5B

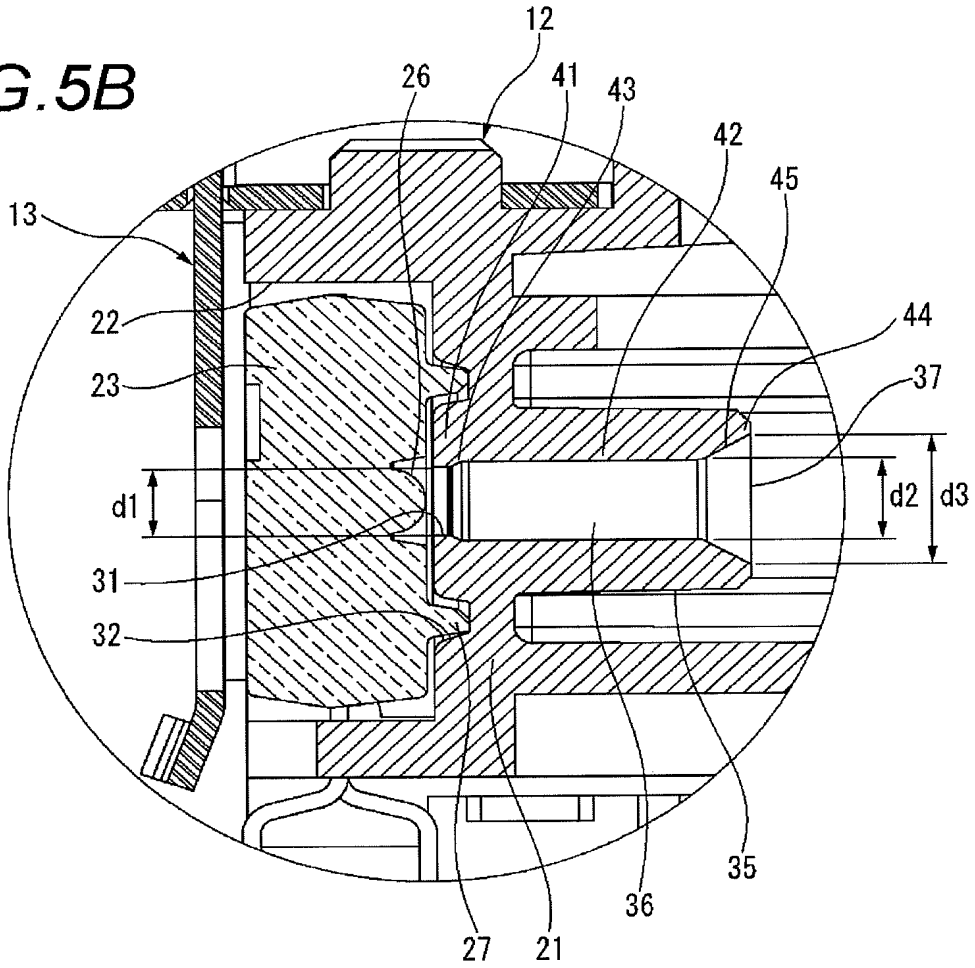

12
26
41
43
42
45
13
22
44
23
37
d1
d2
d3
31
32
35
36
27
21

FIG.6A

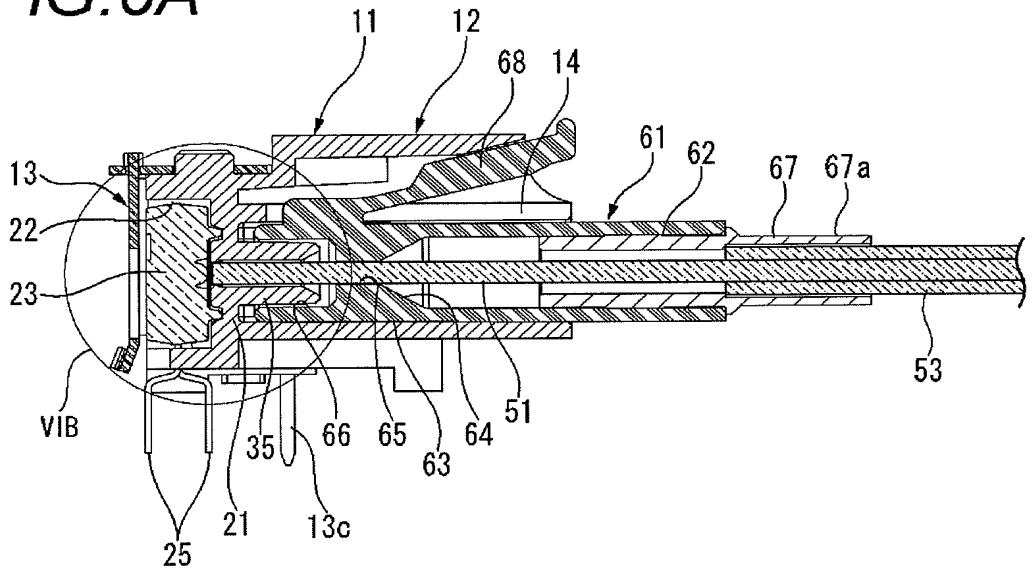

11
12
68
14
61
62
67
67a
13
22
23
53
VIB
35
66
65
63
64
51
21
13c
25

FIG.6B

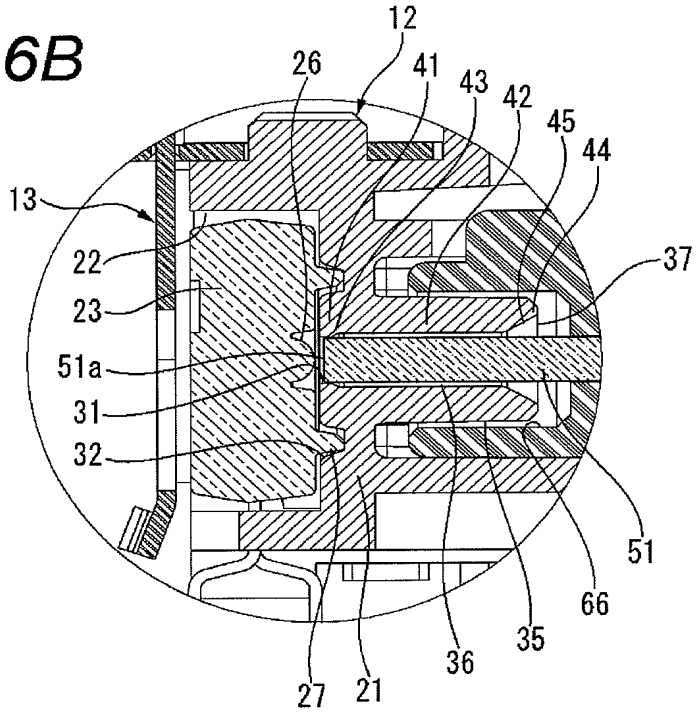

12
26
41
43
42
45
44
13
22
37
23
51a
31
32
51
66
35
36
27
21

FIG.7A

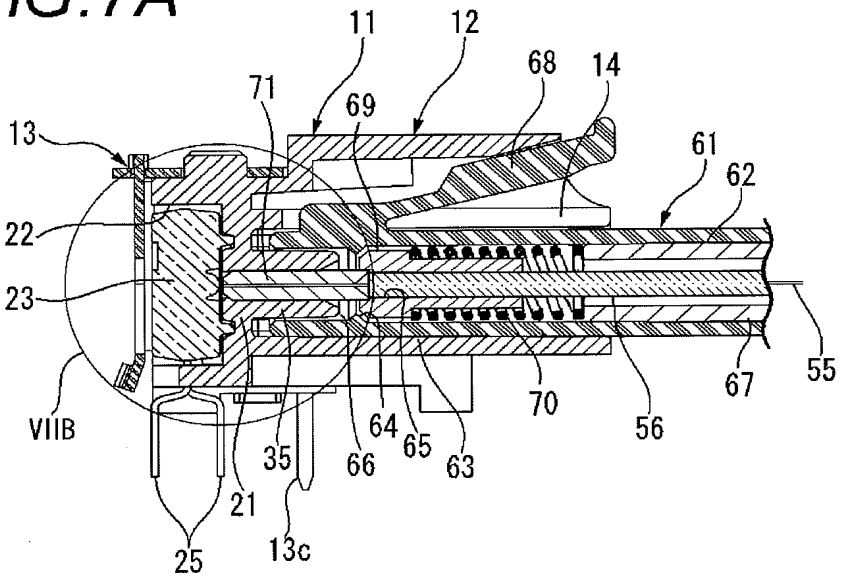

11
12
68
14
71
69
13
61
62
22
23
55
67
70
56
VIIB
64
65
63
35
66
21
13c
25

FIG.7B

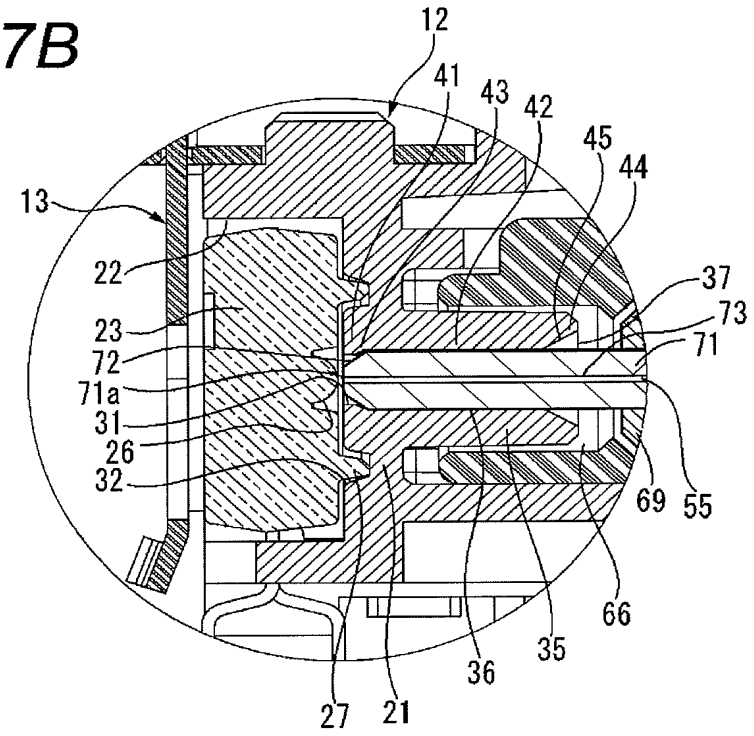
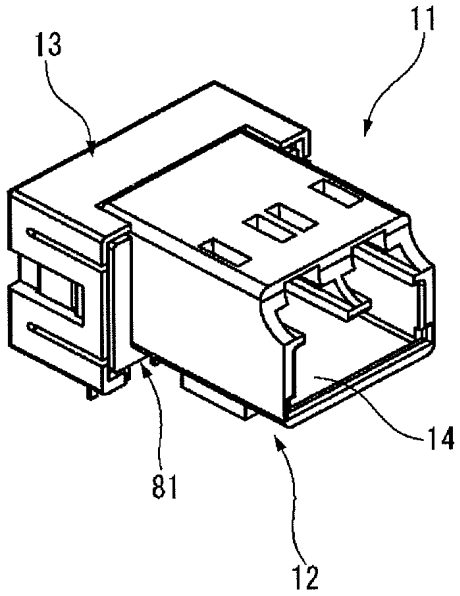

12
41
43
42
45
44
13
22
37
73
23
71
72
71a
31
26
32
69
55
66
35
36
27
21

FIG.8



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 11/67336

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G02B 6/36 (2012.01)
USPC - 385/78
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - G02B 6/36 (2012.01)
USPC - 385/78

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - 385/15,53,55,76,77,78,85,134-137,139

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Database Searched: PubWEST(PGPB,USPT,USOC,EPAB,JPAB), Google Scholar
Search Terms Used: Fiber, optic, transceiver, emitting, receiving, light, connector, coupler, slant, ferrule, slanted

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,936,263 A (Hashizume) 10 August 1999 (10.08.1999), entire document, especially Fig. 1A, Col. 1, lines 20-25; Col. 4, lines 19-25	1-4
X	US 5,195,156 A (Freeman et al.) 16 March 1993 (16.03.1993), entire document, especially Fig. 7; Col. 2, lines 51-55	1-2
A	US 2008/0019643 A1 (Teo et al.) 24 January 2008 (24.01.2008), para. [0028]-[0030], [0037]	1-4
A	US 5,546,212 A (Kunikane et al.) 13 August 1996 (13.08.1996), FIG. 6	1-4

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search
25 April 2012 (25.04.2012)

Date of mailing of the international search report
04 JUN 2012

Name and mailing address of the ISA/US
Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450
Facsimile No. 571-273-3201

Authorized officer:
Lee W. Young
PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 11/67336

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☒ Claims Nos.: 5-6
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. HI Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/857,300	**09/13/2023 07:14:19 AM ET**	**USCO-053-05**

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5557	FILED BY	Michael Leetzow
PATENT CENTER #	62785735	FILING DATE	07/05/2022
CUSTOMER #	152017	FIRST NAMED INVENTOR	Hiep V. Nguyen
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	-

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
IDS2_Form_20230912_USCO05305.pdf	4	Information Disclosure Statement (IDS) Form (SB08)	1257 KB
WO2013100892A1.pdf	32	Foreign Reference	402 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
IDS2_Form_20230912_USCO05305.pdf	C9C8C071B0137C61F6A4C27EF24F6D1671819230A24A9E7772F5B8D7F90DADA62D1D29FEAF37D9A5E6417F186CF1C095C288AFEA6A5F93C5F8CB7E00F0A511D9

WO2013100892A1.pdf 0AE11DBADCBF4484B946781B2A1A4D49185EDD1A239CAC0076576FBFFE39DCA76C59B56E595D2CCBDF4CC330378EB182E9D687F8F699D2A0FEE14A38318BA835

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 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

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/857,300	**08/18/2023 10:50:44 AM ET**	**USCO-053-05**

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5557	FILED BY	Michael Leetzow
PATENT CENTER #	62638467	FILING DATE	07/05/2022
CUSTOMER #	152017	FIRST NAMED INVENTOR	Hiep V. Nguyen
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	-

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
AmendUSCO05305August.pdf	9	Amendment/Request for Reconsideration-After Non-Final Rejection	184 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
AmendUSCO05305August.pdf	5A85047E14031C59CA255C319D32602C3A04EC5861DDB730E FA61362AFE4DFEBAE10D1F727C140D59FD3F8607017B095DF 5F03E47855F9DAEB625E07D8BCBE8E

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 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Hiep V. Nguyen	)
		) Group Art Unit: 2874
Serial No.:	17/857,300	)
		) Examiner: Rojas, Omar R.
Filing Date:	July 5, 2022	)
		)
Title:	Alignment Adapter and Alignment Design for a Connector Therefor	)

Commissioner for Patents
PO Box 1450
Arlington VA 22313-1450

AMENDMENT

In response to an Office Action mailed on July 20, 2023, Applicant amends the application as follows:

IN THE CLAIMS:

1. (Currently Amended) An adapter for holding fiber optic connectors, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located between the first side and the opposing second side, a first fiber optic connector from the first side mating with a second fiber optic connector from the opposing second side within the central portion,

a first internal groove of the first top wall extending from the first side toward the central portion; and

a second internal groove of the first bottom wall also extending from the ~~opposing second~~ first side toward the central portion,

wherein the first internal groove has a first width and the second internal groove has a second width, the first width is greater than the second width, wherein the adapter is free of internal walls outwardly of the central portion in a space between the opposing side walls along the width and between the first top wall and the first bottom wall along the height, and wherein the main body includes at least two channels on the first side to respectively receive the first fiber optic connector and an additional fiber optic connector side-by-side with the first fiber optic connector, and wherein the main body includes at least two channels on the opposing second side to respectively receive the second fiber optic connector and another additional fiber optic connector side-by-side with the second fiber optic connector.

2. (Original) The adapter of claim 1, wherein the central portion includes a wall extending across the opening in the adapter.

3. (Original) The adapter of claim 2, wherein the wall divides the central portion in half.

4. (Original) The adapter of claim 2, wherein the wall has passageways sized to allow respective ferrules from the first fiber optic connector and the second fiber optic connector to engage.

5. (Original) The adapter of claim 1, wherein the first top wall has a dropped top portion and the first bottom wall has a raised bottom portion for mitigating electromagnetic interference (EMI).

6. (Original) The adapter of claim 1, wherein the first top wall and the first bottom wall have a smooth plane structure in the central portion.

7. (Original) The adapter of claim 6, further comprising a wall in the central portion extending across the opening in the adapter.

8. (Original) The adapter of claim 7, wherein the wall has passageways sized to allow respective ferrules from the first fiber optic connector and the second fiber optic connector to engage.

9. (Original) The adapter of claim 1, wherein the main body has a width to receive one fiber optic connector to four fiber optic connectors.

10. (Currently Amended) An adapter for aligning fiber optic ferrules inserted from opposing sides comprising:

a main body having an opening extending between a first side and a second side, the first side and the second side separated by a central portion; and

at least one groove in a top surface and at least one groove in a bottom surface of the main body extending longitudinally toward the central portion from each of the first side and the second side,

wherein the adapter is configured such that a first fiber optic ferrule is received at the first

side and a second fiber optic ferrule is received at the second side of the adapter for alignment by the at least one groove at the top surface and the bottom surface of the main body, and wherein the adapter is configured to mate at least four fiber optic ferrules in pairs, including the first fiber optic ferrule and the second fiber optic ferrule.

11. (Original) The adapter of claim 10, wherein the at least one groove is sized differently on the top surface than on the bottom surface.

12. (Original) The adapter of claim 10, wherein the first fiber optic ferrule is disposed partially inside a first ferrule holder, and

wherein the at least one groove is sized to match a projection on an outside surface of the first ferrule holder for alignment.

13. (Original) The adapter of claim 10, wherein the central portion includes a wall extending across the opening in the adapter.

14. (Original) The adapter of claim 13, wherein the wall divides the central portion in half.

15. (Currently Amended) An adapter for aligning a first fiber optic connector having a first fiber optic ferrule inserted from a first side and a second fiber optic connector having a second fiber optic ferrule inserted from a second side, comprising:

a main body having an opening defined by two opposing side walls, a top surface and a bottom surface joining the two opposing side walls, the opening extending between the first side and the second side, the first side configured to receive the first fiber optic connector and the second side configured to receive the second fiber optic connector;

a central portion inside the main body located between the first side and the second side, the first fiber optic connector and the second fiber optic connector mating in a region of the central portion; and

a first groove disposed on the top surface and a second groove disposed on the bottom

surface on each of the first side and the second side, each of the first groove and the second groove extending toward the central portion from each of the first side and the second side,

wherein the first groove has a dimension different from the second groove, and wherein the main body includes at least two channels on the first side to respectively receive the first fiber optic connector and an additional fiber optic connector side-by-side with the first fiber optic connector, and wherein the main body includes at least two channels on the second side to respectively receive the second fiber optic connector and another additional fiber optic connector side-by-side with the second fiber optic connector.

16. (Original) The adapter of claim 15, wherein the first groove is wider than the second groove.

17. (Original) The adapter of claim 15, wherein the dimension of the first groove matches a dimension of a projection of the first fiber optic connector for alignment.

18. (Currently Amended) An adapter for holding fiber optic connectors, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located between the first side and the opposing second side, a first fiber optic connector from the first side mating with a second fiber optic connector from the opposing second side within the central portion; and

a plurality of internal grooves on each of the first side and the opposing second side within a space of the adapter, the plurality of internal grooves configured to align the first fiber optic connector and the second fiber optic connector in the main body and also align an additional fiber optic connector side-by-side with the first fiber optic connector to an additional

fiber optic connector side-by-side with the second fiber optic connector within the width of the adapter.

19. (Original) The adapter of claim 18, wherein the plurality of internal grooves are sized to receive a respective projection on each of the first fiber optic connector and the second fiber optic connector for alignment.

20. (Original) The adapter of claim 18, wherein the plurality of internal grooves extend longitudinally in a direction toward the central portion.

21. (Currently Amended) An adapter for optical fiber communications, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side into the main body, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located longitudinally inward from the first side,

at least two channels on the first side, each of the at least two channels configured to respectively receive one of at least two fiber optic connectors ~~a fiber optic connector~~ from the first side for an optical connection within the central portion,

a first internal groove of the first top wall extending toward the central portion; and

a second internal groove of the first bottom wall extending toward the central portion, the second internal groove being on a same side of the opening as the first internal groove,

wherein the first internal groove has a first width and the second internal groove has a second width, the first width is greater than the second width, wherein the adapter is free of internal walls outwardly of the central portion in a space between the opposing side walls along the width and between the first top wall and the first bottom wall along the height.

REMARKS

In the above-referenced Office Action, the Examiner rejected claims 1-4, 6-10, and 12-21 under 35 U.S.C. 102(a)(1) as being anticipated by Patent No. 4,645,295 to Pronovost; and rejected claim 11 under pre-AIA 35 U.S.C. 103(a)[1] as being unpatentable over Pronovost as applied to claim 10 above, and further in view of Patent Pub. No. US 2012/0057824 A1 to Katoh; rejected claims 1-21 on the ground of non-statutory double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 10,156,684; and rejected claims 1-21 on the ground of non-statutory double patenting as being unpatentable over claims 1-17 of U.S. Patent No. 10,890,723.

With regard to the rejections on the grounds of non-statutory double patenting, Applicant will submit appropriate terminal disclaimers once the claims are in an otherwise allowable state due to the payment that must accompany the disclaimers.

Applicant has amended claims 1, 10, 15, 18, and 21. Thus claims 1-21 are still pending.

Applicant has amended claim 1 to require that the second internal groove on the first bottom wall extends from the first side toward the central portion like the first internal grove. The Examiner cited element 62 as the first and second internal grooves.[2] However, the two elements 62 in Pronovost are not on the same side of the adapter, rather they are on opposite sides. For this reason alone, claim 1 is allowable.

Applicant has also amended claim 1 to require that the main body includes at least two channels on the first side to respectively receive the first fiber optic connector and an additional fiber optic connector side-by-side with the first fiber optic connector, and wherein the main body includes at least two channels on the opposing second side to respectively receive the second fiber optic connector and another additional fiber optic connector side-by-side with the second fiber optic connector. Pronovost does not allow for more than 2 fiber optic connectors in total, where amended claim 1 has two channels on each of the first side and the second side, each of

[1] Applicant assumes that the reference to the pre-AIA version of 103 is a typographical error given that the recitation of 103 in the Office Action is the AIA version.

[2] By using the same terms in this response that the Examiner has in the rejections, Applicant is not agreeing with that interpretation. For example, Applicant does not agree that elements 62 are necessarily grooves and retains the right to dispute that term later.

the channels receiving one of the fiber optic connectors. Thus, the adapter in claim 1 can accept 4 fiber optic connectors. For this additional reason, claim 1 is allowable.

Claims 2-9, depending from claim 1, are allowable for at least the same reasons as claim 1. Applicant notes that claim 5 was not addressed except as being rejected on the ground of non-statutory double patenting. Thus, claim 5 will be allowable upon the filing of a terminal disclaimer.

With regard to claim 10, Applicant has amended the claim to require that there is at least one groove in a top surface and at least one groove in a bottom surface of the main body extending longitudinally toward the central portion from each of the first side and the second side. There are only two grooves 62 in the adapter in Pronovost and not the four that are called for in amended claim 10. Thus, claim 10 is allowable.

Applicant has also amended claim 10 to require that the adapter is configured to mate at least four fiber optic ferrules in pairs, including the first fiber optic ferrule and the second fiber optic ferrule. Pronovost only allows for two fiber optic ferrules, one on each side. This provides an additional reason that claim 10 is allowable. Dependent claims 11-14 are allowable for at least the same reasons.

Turning to claim 15, Applicant has amended this claim to require that the main body includes at least two channels on the first side to respectively receive the first fiber optic connector and an additional fiber optic connector side-by-side with the first fiber optic connector, and wherein the main body includes at least two channels on the second side to respectively receive the second fiber optic connector and another additional fiber optic connector side-by-side with the second fiber optic connector. Once again, Pronovost can only receive one fiber optic connector on each side, not the at least two that is called for in claim 15. Thus, this claim is allowable for this reason. Dependent claims 16 and 17 are allowable for at least the same reasons.

Applicant has also amended claim 18, to require that there are a plurality of internal grooves on each of the first side and the opposing second side and that they also align an additional fiber optic connector side-by-side with the first fiber optic connector to an additional fiber optic connector side-by-side with the second fiber optic connector within the width of the

adapter. This amendment requires that there be two fiber optic connectors on each side of the adapter. As noted above, Pronovost only allows for one fiber optic connector on each side. Moreover, there are not a plurality of internal grooves on each the first and second sides. Thus, this claim is allowable for at least these reasons. Dependent claims 19-20 are allowable for at least the same reasons.

Applicant has also amended claim 21 to require that there be at least two channels on the first side, each of the at least two channels configured to respectively receive one of at least two fiber optic connectors from the first side for an optical connection within the central portion. Again, Pronovost only has one fiber optic connector on each side.

Claim 21 also requires a second internal groove of the first bottom wall extending toward the central portion, the second internal groove being on a same side of the opening as the first internal groove. The grooves 62 in Pronovost are not on the same side of the opening as required by the amended claim.

Finally, the Examiner rejected claim 11 as being unpatentable over Pronovost as applied to claim 10 above, and further in view of Katoh. Katoh was cited for having keys with different sizes. However, Katoh does not cure the deficiencies of Pronovost noted above for claim 10. Thus, claim 11 is also allowable.

Applicant submits that the claims as amended are allowable and requests that the application be passed to issuance.

Respectfully submitted,

/Michael L. Leetzow/
Michael L. Leetzow PLLC
Registration No. 35,932
1205 S Keswick Dr.
Troy, VA 22974
Telephone: 407/302-9970

Date: August 18, 2023

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 17/857,300	Filing Date 07/05/2022	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) 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 $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ 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	08/18/2023	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 5	Minus	*** 5	= 0		x $480 =	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		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ 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.	SLIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/STEPHEN TYLER HOLLAND/
*** 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.	

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.

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.
17/857,300	07/05/2022	Hiep V. Nguyen	USCO-053-05	5557

152017 7590 07/20/2023

US Conec Ltd.
1138 25th Street Southeast
Hickory, NC 28602

EXAMINER
ROJAS, OMAR R

ART UNIT	PAPER NUMBER
2874	

NOTIFICATION DATE	DELIVERY MODE
07/20/2023	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@usconec.com
eofficeaction@appcoll.com
michael@leetzow.com

Office Action Summary	Application No. 17/857,300	Applicant(s) Nguyen et al.	
	Examiner Omar R Rojas	Art Unit 2874	AIA (FITF) 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 _____.

☐ 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) 1-21 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) 1-21 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 July 5, 2022 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

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

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

Priority under 35 U.S.C. § 119

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

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

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

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

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

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

Attachment(s)

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

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

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

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Information Disclosure Statement

2. The prior art documents submitted by applicant(s) in the Information Disclosure Statement(s) ("IDS") filed on June 29, 2023 have all been considered and made of record (note the attached copy of form(s) PTO/SB/08a).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

4. Claim(s) 1-4, 6-10, and 12-21 is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Patent No. 4,645,295 to Pronovost (hereinafter "Pronovost"). Pronovost was cited by applicant in the IDS.

In re claim 1, Pronovost discloses an adapter (sleeve member 10) for holding fiber optic connectors (400), see FIGS. 1-3, the adapter (10) comprising:

a main body having a width and a height and an opening extending longitudinally from a first side (12) to an opposing second side (14), the main body comprising two opposing side walls (54) spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls (54);

a central portion inside the main body located between the first side (12) and the opposing second side (14), a first fiber optic connector (16) from the first side (12) mating with a second fiber optic connector (16) from the opposing second side (14) within the central portion,

a first internal groove/keyway (62) of the first top wall extending from the first side (12) toward the central portion; and

a second internal groove (62) of the first bottom wall extending from the opposing second side (14) toward the central portion,

wherein the first internal groove (62) has a variable width due to its curvature including a first maximum width and the second internal groove (62) has a variable width including a second minimum width, the first maximum width is greater than the second minimum width (as seen in FIG. 1), wherein the adapter (10) is free of internal walls outwardly of the central portion in a space between the opposing side walls (54) along the width and between the first top wall and the first bottom wall along the height. *See* columns 3-6 of Pronovost for further details.

In re claim 2, the central portion includes a wall (72) extending across the opening in the adapter (10).

In re claim 3, the wall (72) divides the central portion in half.

In re claim 4, the wall (72) has passageways (84) sized to allow respective ferrules (16) (16) from the first fiber optic connector and the second fiber optic connector to optically engage.

In re claim 6, as seen in FIG. 1 and 3, the first top wall and the first bottom wall have a smooth

plane structure in the central portion.

In re claim 7, Pronovost further discloses a wall (72) in the central portion extending across the opening in the adapter (10).

In re claim 8, the wall (72) has passageways (84) sized to allow respective ferrules (16) (16) from the first fiber optic connector and the second fiber optic connector to optically engage.

In re claim 9, the main body has a width to receive one fiber optic connector (16) to two fiber optic connectors (400).

In re claim 10, Pronovost discloses an adapter (10) for aligning fiber optic ferrules (16) inserted from opposing sides, see FIGS. 1-3, comprising:

a main body having an opening extending between a first side (12) and a second side (14), the first side (12) and the second side (14) separated by a central portion; and

at least one groove (62) in a top surface and a bottom surface of the main body extending longitudinally toward the central portion from each of the first side (12) and the second side (14), wherein the adapter (10) is configured such that a first fiber optic ferrule is received at the first side (12) and a second fiber optic ferrule is received at the second side (14) of the adapter (10) for alignment by the at least one groove (62) at the top surface and the bottom surface of the main body. *See* columns 3-6 of Pronovost for further details.

In re claim 12, the first fiber optic ferrule (16) is disposed partially inside a first ferrule holder

comprising flaps (48), and wherein the at least one groove (62) is sized to match a projection on an outside surface of the first ferrule holder comprising flaps (48) for alignment.

In re claim 13, the central portion includes a wall (72) extending across the opening in the adapter (10).

In re claim 14, the wall (72) divides the central portion in half.

In re claim 15, Pronovost discloses an adapter (10) for aligning a first fiber optic connector having a first fiber optic ferrule inserted from a first side (12) and a second fiber optic connector having a second fiber optic ferrule inserted from a second side (14), see FIGS. 1-3, comprising:

a main body having an opening defined by two opposing side walls (54), a top surface and a bottom surface joining the two opposing side walls (54), the opening extending between the first side (12) and the second side (14), the first side (12) configured to receive the first fiber optic connector and the second side (14) configured to receive the second fiber optic connector;

a central portion inside the main body located between the first side (12) and the second side (14), the first fiber optic connector (16) and the second fiber optic connector (16) mating in a region of the central portion; and

a first groove (62) disposed on the top surface and a second groove (62) disposed on the bottom surface on each of the first side (12) and the second side (14), each of the first groove (62) and the second groove (62) extending toward the central portion from each of the first side (12) and the second side (14),

wherein the first groove (62) has a maximum width dimension different from a minimum

width dimension of the second groove (62). *See* columns 3-6 of Pronovost for further details.

In re claim 16, the first groove (62) is wider at its widest point than the second groove (62) at its narrowest point.

In re claim 17, the dimension of the first groove (62) matches a dimension of a projection (60) of the first fiber optic connector (16) for alignment.

In re claim 18, Pronovost discloses an adapter (10) for holding fiber optic connectors (400), see FIGS. 1-3, the adapter (10) comprising: a main body having a width and a height and an opening extending longitudinally from a first side (12) to an opposing second side (14), the main body comprising two opposing side walls (54) spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls (54);

a central portion inside the main body located between the first side (12) and the opposing second side (14), a first fiber optic connector (16) from the first side (12) mating with a second fiber optic connector (16) from the opposing second side (14) within the central portion; and

a plurality of internal grooves (62) within a space of the adapter (10), the plurality of internal grooves (62) configured to align the first fiber optic connector (16) and the second fiber optic connector (16) in the main body. *See* columns 3-6 of Pronovost for further details.

In re claim 19, the plurality of internal grooves (62) are sized to receive a respective projection

(60) on each of the first fiber optic connector and the second fiber optic connector for alignment.

In re claim 20, the plurality of internal grooves (62) extend longitudinally in a direction toward the central portion.

In re claim 21, Pronovost discloses an adapter (10) for optical fiber communications, see FIGS. 1-3, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side (12) into the main body, the main body comprising two opposing side walls (54) spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls (54);

a central portion inside the main body located longitudinally inward from the first side (12),

at least two channels/recesses (44) each configured to respectively receive a fiber optic connector (16) from the first side (12) for an optical connection within the central portion,

a first internal groove (62) of the first top wall extending toward the central portion; and

a second internal groove (62) of the first bottom wall extending toward the central portion, wherein the first internal groove (62) has a first maximum width (due to the curvature of the groove 62) and the second internal groove (62) has a second minimum width, the first maximum width is greater than the second minimum width, wherein the adapter is free of internal walls outwardly of the central portion in a space between the opposing side walls (54) along the width and between the first top wall and the first bottom wall along the height. *See*

columns 3-6 of Pronovost for further details.

Claim Rejections - 35 USC § 103

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

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

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

7. Claim 11 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Pronovost as applied to claim 10 above, and further in view of Patent Pub. No. US 2012/0057824 A1 to KATOH ("Katoh"). Katoh was also cited by applicant in the IDS.

In re claim 11, Pronovost only differs in that he does not teach his at least one groove (62) is sized differently on the top surface than on the bottom surface. Katoh, on the other hand, teaches a connector (1) having keys (51, 52) that are sized differently on a top surface than on a bottom surface. In order to receive the connector (1) of Katoh, the at least one groove (62) of Pronovost would have been sized differently on the top surface than on the bottom surface, thereby obtaining the invention specified by claim 11. Therefore, it would have been obvious to one ordinary skill in the art before the effective filing date of the claimed invention to obtain the

invention specified by claim 11 in view of Pronovost combined with Katoh.

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used.

Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

9. **Claims 1-21 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 10,156,684 (hereinafter "the '684 patent").** The '684 parent was also cited by applicant(s) in the IDS. Although the claims at issue are not identical, they are not patentably distinct from each other because both sets of claims are directed to the same underlying embodiment and the same disclosure. Claims 1-11 of the '684 patent only differ from pending claims 1-21 in that the patented claims do not recite all of the additional aspects recited in pending claims 1-21. It would have been obvious to one of ordinary skill in the art before the effective filing date to modify the invention of claims 1-11 of the '684 patent to include additional unclaimed aspects from the underlying embodiment of the patented claims, thereby obtaining the invention specified by pending claims 1-21. Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date to obtain the invention specified by claims 1-21 in view of claims 1-11 of the '684 patent.

10. **Claims 1-21 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-17 of U.S. Patent No. 10,890,723 (hereinafter "the '723 patent").** Although the claims at issue are not identical, they are not patentably distinct from each other because both sets of claims are directed to the same underlying embodiment and the same disclosure. Claims 1-17 of the '723 patent only differ from pending claims 1-21 in that the

patented claims do not recite all of the additional aspects recited in pending claims 1-21. It would have been obvious to one of ordinary skill in the art before the effective filing date to modify the invention of claims 1-17 of the '723 patent to include additional unclaimed aspects from the underlying embodiment of the patented claims, thereby obtaining the invention specified by pending claims 1-21. Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date to obtain the invention specified by claims 1-21 in view of claims 1-17 of the '723 patent.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Omar R. Rojas whose telephone number is (571)272-2357. The examiner can normally be reached on Monday-Friday, 10AM-6PM EST.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas 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.

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.

/Omar R Rojas/
Primary Examiner
Art Unit 2874

or
July 15, 2023

Notice of References Cited	Application/Control No. 17/857,300	Applicant(s)/Patent Under Reexamination Nguyen et al.	
	Examiner Omar R Rojas	Art Unit 2874	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-10890723-B2	01-2021	Nguyen; Hiep V.	G02B6/3885	1/1
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

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.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/857,300	Nguyen et al.
	Examiner	Art Unit
	Omar R Rojas	2874

CPC - Searched*		
Symbol	Date	Examiner

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
Checked refs. for 17/145,864.	07/14/2023	/ORR/

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/Omar R Rojas/ Primary Examiner, Art Unit 2874	

Senko Advanced Components v. LIS Cogec Ltd.
Senko EX1025-A
Page 293

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

PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	17857300
Filing Date	2022-07-05
First Named Inventor	Hiep V. Nguyen
Art Unit	OPAP
Examiner Name	Docket CENTRAL
Attorney Docket Number	USCO-053-05

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /ORR/

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	10156684	B2	2018-12-18	Nguyen et al.	
	2	4645295	A	1987-02-24	Pronovost	
	3	5121454	A	1992-06-09	Iwano et al.	
	4	5129024	A	1992-07-01	Honma	
	5	5537501	A	1996-07-16	Iwano et al.	
	6	6293708	B1	2001-09-25	Ohtsuka et al.	
	7	6331079	B1	2001-12-01	Grois	
	8	6361218	B1	2002-03-26	Matasek et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /ORR/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17857300
	Filing Date	2022-07-05
	First Named Inventor	Hiep V. Nguyen
	Art Unit	OPAP
	Examiner Name	Docket CENTRAL
	Attorney Docket Number	USCO-053-05

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /ORR/

	9	6406192	B1	2002-06-18	Chen et al.	
	10	9086546	B2	2015-07-21	Jones	
	11	9366829	B2	2016-06-14	Czosnowski et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20020172469	A1	2002-11-21	Benner	
	2	20050281509	A1	2005-12-22	Cox et al.	
	3	20080131055	A1	2008-06-05	Edward et al.	
	4	20110091158	A1	2011-04-21	Iwaya et al.	
	5	20120057824	A1	2012-03-08	Katoh	
	6	20140241689	A1	2014-08-28	Bradley et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /ORR/

Receipt date: 06/29/2023

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(**Not for submission under 37 CFR 1.99)**

Application Number	17857300
Filing Date	2022-07-05
First Named Inventor	Hiep V. Nguyen
Art Unit	OPAP
Examiner Name	Docket CENTRAL
Attorney Docket Number	USCO-053-05

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /ORR/

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	202600189	CN	U	2012-12-12	Unknown		☒
	2	2004354693	JP	A	2004-12-16	Nakagawa et al.		☒
	3	2013179197	WO	A1	2013-12-05	Xue et al.		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Molex Incorporated, HBMT Motherboard Adapter Drawing, dated October 31, 2005	☐

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

EXAMINER SIGNATURE

Examiner Signature	/Omar R Rojas/	Date Considered	07/14/2023

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

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /ORR/

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/857,300	**06/29/2023 05:31:12 PM ET**	**USCO-053-05**

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5557	FILED BY	Michael Leetzow
PATENT CENTER #	62365797	AUTHORIZED BY	-
CUSTOMER #	152017	FILING DATE	07/05/2022
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Hiep V. Nguyen

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 1000	**E20236SH32087243**	**Michael Leetzow**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1202	EACH CLAIM IN EXCESS OF 20	100.00	1	100.00
1201	EACH INDEPENDENT CLAIM IN EXCESS OF THREE	480.00	1	480.00
			TOTAL AMOUNT:	**$580.00**

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 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

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/857,300	**06/29/2023 05:31:12 PM ET**	**USCO-053-05**

Title of Invention

Alignment Adapter and Alignment Design for a Connector Therefor

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5557	FILED BY	Michael Leetzow
PATENT CENTER #	62365797	FILING DATE	07/05/2022
CUSTOMER #	152017	FIRST NAMED INVENTOR	Hiep V. Nguyen
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	-

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
PreliminaryAmend.pdf	7	Preliminary Amendment	130 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
PreliminaryAmend.pdf	7E03D873CF35CC95BBC3DF4EF61A8E4F1188517EA4E2EF22536D2DD575496A8FA0CFFB9307BC985C16C956FD92FB15E3F0CDF31FC2B1B5C3DF8BF5373DD5006E

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 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Hiep V. Nguyen	)
		) Group Art Unit: 2874
Serial No.:	17/857,300	)
		) Examiner: Rojas, Omar R.
Filing Date:	July 5, 2022	)
		)
Title:	Alignment Adapter and Alignment Design for a Connector Therefor	)

Commissioner for Patents
PO Box 1450
Arlington VA 22313-1450

PRELIMINARY AMENDMENT

Further to the application as filed on July 5, 2022, Applicant amends the application as follows:

IN THE CLAIMS:

1. (Original) An adapter for holding fiber optic connectors, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located between the first side and the opposing second side, a first fiber optic connector from the first side mating with a second fiber optic connector from the opposing second side within the central portion,

a first internal groove of the first top wall extending from the first side toward the central portion; and

a second internal groove of the first bottom wall extending from the opposing second side toward the central portion,

wherein the first internal groove has a first width and the second internal groove has a second width, the first width is greater than the second width, wherein the adapter is free of internal walls outwardly of the central portion in a space between the opposing side walls along the width and between the first top wall and the first bottom wall along the height.

2. (Original) The adapter of claim 1, wherein the central portion includes a wall extending across the opening in the adapter.

3. (Original) The adapter of claim 2, wherein the wall divides the central portion in half.

4. (Original) The adapter of claim 2, wherein the wall has passageways sized to allow respective ferrules from the first fiber optic connector and the second fiber optic connector to engage.

5. (Original) The adapter of claim 1, wherein the first top wall has a dropped top portion and

the first bottom wall has a raised bottom portion for mitigating electromagnetic interference (EMI).

6. (Original) The adapter of claim 1, wherein the first top wall and the first bottom wall have a smooth plane structure in the central portion.

7. (Original) The adapter of claim 6, further comprising a wall in the central portion extending across the opening in the adapter.

8. (Original) The adapter of claim 7, wherein the wall has passageways sized to allow respective ferrules from the first fiber optic connector and the second fiber optic connector to engage.

9. (Original) The adapter of claim 1, wherein the main body has a width to receive one fiber optic connector to four fiber optic connectors.

10. (Original) An adapter for aligning fiber optic ferrules inserted from opposing sides comprising:

a main body having an opening extending between a first side and a second side, the first side and the second side separated by a central portion; and

at least one groove in a top surface and a bottom surface of the main body extending longitudinally toward the central portion from each of the first side and the second side,

wherein the adapter is configured such that a first fiber optic ferrule is received at the first side and a second fiber optic ferrule is received at the second side of the adapter for alignment by the at least one groove at the top surface and the bottom surface of the main body.

11. (Original) The adapter of claim 10, wherein the at least one groove is sized differently on the top surface than on the bottom surface.

12. (Original) The adapter of claim 10, wherein the first fiber optic ferrule is disposed partially inside a first ferrule holder, and

wherein the at least one groove is sized to match a projection on an outside surface of the first ferrule holder for alignment.

13. (Original) The adapter of claim 10, wherein the central portion includes a wall extending across the opening in the adapter.

14. (Original) The adapter of claim 13, wherein the wall divides the central portion in half.

15. (Original) An adapter for aligning a first fiber optic connector having a first fiber optic ferrule inserted from a first side and a second fiber optic connector having a second fiber optic ferrule inserted from a second side, comprising:

a main body having an opening defined by two opposing side walls, a top surface and a bottom surface joining the two opposing side walls, the opening extending between the first side and the second side, the first side configured to receive the first fiber optic connector and the second side configured to receive the second fiber optic connector;

a central portion inside the main body located between the first side and the second side, the first fiber optic connector and the second fiber optic connector mating in a region of the central portion; and

a first groove disposed on the top surface and a second groove disposed on the bottom surface on each of the first side and the second side, each of the first groove and the second groove extending toward the central portion from each of the first side and the second side,

wherein the first groove has a dimension different from the second groove.

16. (Original) The adapter of claim 15, wherein the first groove is wider than the second groove.

17. (Original) The adapter of claim 15, wherein the dimension of the first groove matches a

dimension of a projection of the first fiber optic connector for alignment.

18. (Original) An adapter for holding fiber optic connectors, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side to an opposing second side, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located between the first side and the opposing second side, a first fiber optic connector from the first side mating with a second fiber optic connector from the opposing second side within the central portion; and

a plurality of internal grooves within a space of the adapter, the plurality of internal grooves configured to align the first fiber optic connector and the second fiber optic connector in the main body.

19. (Original) The adapter of claim 18, wherein the plurality of internal grooves are sized to receive a respective projection on each of the first fiber optic connector and the second fiber optic connector for alignment.

20. (Original) The adapter of claim 18, wherein the plurality of internal grooves extend longitudinally in a direction toward the central portion.

21. (New) An adapter for optical fiber communications, the adapter comprising:

a main body having a width and a height and an opening extending longitudinally from a first side into the main body, the main body comprising two opposing side walls spaced apart along the width and a first top wall and a first bottom wall spaced apart along the height, each of the first top wall and the first bottom wall extending widthwise between the two opposing side walls;

a central portion inside the main body located longitudinally inward from the first side,

at least two channels each configured to respectively receive a fiber optic connector from the first side for an optical connection within the central portion,

a first internal groove of the first top wall extending toward the central portion; and

a second internal groove of the first bottom wall extending toward the central portion, wherein the first internal groove has a first width and the second internal groove has a second width, the first width is greater than the second width, wherein the adapter is free of internal walls outwardly of the central portion in a space between the opposing side walls along the width and between the first top wall and the first bottom wall along the height.

REMARKS

Applicant has added an extra independent claim to further claim the invention. Additional claim fees have been paid.

Respectfully submitted,

/Michael L. Leetzow/
Michael L. Leetzow PLLC
Registration No. 35,932
1205 S Keswick Dr.
Troy, VA 22974
Telephone: 407/302-9970

Date: June 29, 2023