April 25th, 2018

Commissioner of Patents, USPTO

General Transmittal

Application No: 62/532,710

Confirmation No: 7780

Provisional processing fee of $50 is posted.

Sincerely Yours,

/ESJ/

Edward Jarmolowicz

47,238

Electronic Patent Application Fee Transmittal					
Application Number:	62532710				
Filing Date:	14-Jul-2017				
Title of Invention:	Grouped Mini CS Fiber Optic Connectors				
First Named Inventor/Applicant Name:	Kazuyoshi Takano				
Filer:	Edward Jarmolowicz				
Attorney Docket Number:	Senko.09100US01				
Filed as Small Entity					
Filing Fees for Provisional					
Description		**Fee Code**	**Quantity**	**Amount**	**Sub-Total in USD($)**
Basic Filing:					
Pages:					
Claims:					
Miscellaneous-Filing:					
Petition:					
Patent-Appeals-and-Interference:					
Post-Allowance-and-Post-Issuance:					
Extension-of-Time:					

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
PROCESSING FEE FOR PROVIS. APPLICATIONS	2807	1	50	50
		Total in USD ($)		**50**

Electronic Acknowledgement Receipt	
EFS ID:	32438118
Application Number:	62532710
International Application Number:	
Confirmation Number:	7780
Title of Invention:	Grouped Mini CS Fiber Optic Connectors
First Named Inventor/Applicant Name:	Kazuyoshi Takano
Customer Number:	152878
Filer:	Edward Jarmolowicz
Filer Authorized By:	
Attorney Docket Number:	Senko.09100US01
Receipt Date:	25-APR-2018
Filing Date:	14-JUL-2017
Time Stamp:	11:51:39
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$50
RAM confirmation Number	042518INTEFSW11515800
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	S09100Fee.pdf	41092 2288f7a6865137770df2a62442600f0ab39c2eb4	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30350 9344c0b651306fc02646e321e634bb1827b4beee	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	71442		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
62/532,710	07/14/2017	Kazuyoshi Takano	P1170US0P1

CONFIRMATION NO. 7780

136404
Pepper Hamilton LLP/Boston
Attn: Boston IP Docketing Department
125 High Street
19th Floor
Boston, MA 02110-2736

POWER OF ATTORNEY NOTICE

OC000000097345702

Date Mailed: 02/13/2018

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 02/08/2018.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/cnguyen/

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
62/532,710	07/14/2017	Kazuyoshi Takano	P1170US0P1

CONFIRMATION NO. 7780

152878
Senko Advanced Components, Inc.
450 Donald Lynch Blvd
Unit D
Marlborough, MA 01752

POA ACCEPTANCE LETTER

OC000000097345741

Date Mailed: 02/13/2018

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 02/08/2018.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/cnguyen/

530 / TW

PTO/AIA/80 (07-12)
Approved for use through 11/30/2014. OMB 0651-0035
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.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

☒ Practitioners associated with Customer Number: 000152878

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number

Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignments documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

☒ The address associated with Customer Number: 000152878

OR

☐

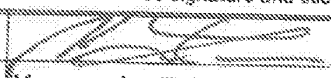
Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address: Senko Advanced Components, Inc
450 Donald Lynch Blvd, Unit D
Marlborough, MA 01752

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be Filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of The practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

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

Signature		Date	1/22/2018
Name	Kazuyosho Takano	Telephone	5084949957
Title	Executive Vice President		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. 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 3 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/AIA/96 (08-12)
Approved for use through 01/31/2013. 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.

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Senko Advanced Components, Inc.

Application No./Patent No.: 62/532,710 Filed/Issue Date: July 14, 2017

Titled: GROUPED MINI CS FIBER OPTIC CONNECTORS

Senko Advanced Components, Inc., a Corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose one of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose one of options A or B below):

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 043168, Frame 0541, or for which a copy thereof is attached.

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

This collection of information is required by 37 CFR 3.73(b). 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. 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/AIA/96 (08-12)
Approved for use through 01/31/2013. 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.

STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Signature	1/22/2018 Date
Edward S. Jarmolowicz Printed or Typed Name	47,238 Title or Registration Number

Electronic Acknowledgement Receipt	
EFS ID:	31741753
Application Number:	62532710
International Application Number:	
Confirmation Number:	7780
Title of Invention:	Grouped Mini CS Fiber Optic Connectors
First Named Inventor/Applicant Name:	Kazuyoshi Takano
Customer Number:	136404
Filer:	Edward Jarmolowicz
Filer Authorized By:	
Attorney Docket Number:	P1170US0P1
Receipt Date:	08-FEB-2018
Filing Date:	14-JUL-2017
Time Stamp:	16:10:37
Application Type:	Provisional

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		poa5500.pdf	242138 39a79cb6a147b397406be853e6faf0d98e9ed7a4	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Power of Attorney	1	1
	Assignee showing of ownership per 37 CFR 3.73	2	3
Warnings:			
Information:			
	Total Files Size (in bytes):	242138	

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

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
62/532,710	07/14/2017	Kazuyoshi Takano	133077.05500

CONFIRMATION NO. 7780

136404
Pepper Hamilton LLP/Boston
Attn: Boston IP Docketing Department
125 High Street
19th Floor
Boston, MA 02110-2736

POWER OF ATTORNEY NOTICE

OC000000095550106

Date Mailed: 11/20/2017

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/16/2017.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/sleutchit/

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
62/532,710	07/14/2017	Kazuyoshi Takano	P1170US0P1

CONFIRMATION NO. 7780

136404
Pepper Hamilton LLP/Boston
Attn: Boston IP Docketing Department
125 High Street
19th Floor
Boston, MA 02110-2736

POA ACCEPTANCE LETTER

OC000000095550117

Date Mailed: 11/20/2017

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/16/2017.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/sleutchit/

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82A (07-13)
Approved for use through 01/31/2018. OMB 0651-0035
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.

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	62/532,710
Filing Date	2017-07-14
First Named Inventor	Kazuyoshi TAKANO
Title	Grouped Mini CS Fiber Optic Connectors
Art Unit	
Examiner Name	
Attorney Docket Number	P1170US0P1

SIGNATURE of Applicant or Patent Practitioner

Signature	/Margaret Burke/	Date (Optional)	
Name	Margaret Burke	Registration Number	34474
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☑ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 3 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.

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82B (07-13)
Approved for use through 01/31/2018. OMB 0651-0035
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

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date
62/532,710	2017-07-14

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 140382

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☑ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box)

Senko Advanced Components, Inc.

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	Dec 15, 2017
Name	Kazuyoshi TAKANO		
Title	Executive Vice President		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☑ Total of 1 forms are submitted.

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

Electronic Acknowledgement Receipt	
EFS ID:	30966541
Application Number:	62532710
International Application Number:	
Confirmation Number:	7780
Title of Invention:	Grouped Mini CS Fiber Optic Connectors
First Named Inventor/Applicant Name:	Kazuyoshi Takano
Customer Number:	136404
Filer:	Margaret Alice Burke
Filer Authorized By:	
Attorney Docket Number:	133077.05500
Receipt Date:	16-NOV-2017
Filing Date:	14-JUL-2017
Time Stamp:	09:56:09
Application Type:	Provisional

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	Signed_POA.pdf	1212406 eabe8b0f3cb49b21e93b6689ab1e52d0fe77cb58	no	2

Warnings:

Information:	
Total Files Size (in bytes):	1212406

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

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
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UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
62/532,710	07/14/2017	Kazuyoshi Takano	133077.05500

CONFIRMATION NO. 7780

136404
Pepper Hamilton LLP/Boston
Attn: Boston IP Docketing Department
125 High Street
19th Floor
Boston, MA 02110-2736

POA ACCEPTANCE LETTER

OC000000093331415

Date Mailed: 08/10/2017

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 08/08/2017.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/ldvan/

PTO/AIA/80 (07-17)
Approved for use through 01/31/2018. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

[X] Practitioners associated with Customer Number: 136404

OR

[ ] Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

[X] The address associated with Customer Number: 136404

OR

[ ]

Firm or individual name		
Address		
City	State	Zip
Country		
Telephone	Email	

Assignee name and address: Benko Advanced Components, Inc
450 Donald Lynch Blvd., Unit D
Marlborough, MA 01752

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

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

Signature	Date 9/1/2017
Name Kazuyoshi Takano	Telephone 508 494 9957
Title Executive Vice President	

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 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.

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.

PTO/AIA/96 (08-12)
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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Senko Advanced Components, Inc.

Application No./Patent No.: 62/532,710 Filed/Issue Date: July 14, 2017

Titled: GROUPED MINI CS FIBER OPTIC CONNECTORS

Senko Advanced Components, Inc., a Corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 043168, Frame 0541, or for which a copy thereof is attached.

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

   1. From: _____ To: _____

      The document was recorded in the United States Patent and Trademark Office at

      Reel _____, Frame _____, or for which a copy thereof is attached.

   2. From: _____ To: _____

      The document was recorded in the United States Patent and Trademark Office at

      Reel _____, Frame _____, or for which a copy thereof is attached.

This collection of information is required by 37 CFR 3.73(b). 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. 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/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Alison L. McCarthy/	August 7, 2017
Signature	Date
Alison L. McCarthy	51,998
Printed or Typed Name	Title or Registration Number

[Page 2 of 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 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.

Electronic Acknowledgement Receipt	
EFS ID:	29999094
Application Number:	62532710
International Application Number:	
Confirmation Number:	7780
Title of Invention:	Grouped Mini CS Fiber Optic Connectors
First Named Inventor/Applicant Name:	Kazuyoshi Takano
Customer Number:	136404
Filer:	Alison L. McCarthy/Sharon Calhoun
Filer Authorized By:	Alison L. McCarthy
Attorney Docket Number:	133077.05500
Receipt Date:	08-AUG-2017
Filing Date:	14-JUL-2017
Time Stamp:	10:23:55
Application Type:	Provisional

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	POA-to-Pepper-Boston.pdf	1476230 a3d880f20ceb34e006061f075b9c99a78e7d589e	no	2

Warnings:

Information:					
2	Assignee showing of ownership per 37 CFR 3.73	5500-Assignee-Statement-aia0096.pdf	117776 aae41292e94eb8c593d9514b68d0098321b1f1d4	no	3
Warnings:					
Information:					
		Total Files Size (in bytes):	1594006		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
62/532,710	07/14/2017		130	133077.05500		

CONFIRMATION NO. 7780

FILING RECEIPT

136404
Pepper Hamilton LLP/Boston
Attn: Boston IP Docketing Department
125 High Street
19th Floor
Boston, MA 02110-2736

OC000000092895820

Date Mailed: 07/20/2017

Receipt is acknowledged of this provisional patent application. It will not be examined for patentability and will become abandoned not later than twelve months after its filing date. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Kazuyoshi Takano, Southborough, MA;
Jimmy Jun-Fu Chang, Worcester, MA;

Applicant(s)

Senko Advanced Components, Inc., Marlborough, MA

Power of Attorney:
Alison McCarthy--51998

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 07/19/2017

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 62/532,710**

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No
** **SMALL ENTITY** **

Title

Grouped Mini CS Fiber Optic Connectors

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

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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

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

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

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

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

license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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

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

NOT GRANTED

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

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

PTO/AIA/14 (11-15)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	133077.05500
	Application Number	
Title of Invention	Grouped Mini CS Fiber Optic Connectors	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

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

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Kazuyoshi		Takano	

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

City	Southborough	State/Province	MA	Country of Residence	US

Mailing Address of Inventor:

Address 1	11 Fiddle Neck Lane		
Address 2			
City	Southborough	State/Province	MA
Postal Code	01772	Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Jimmy	Jun-Fu	Chang	

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

City	Worcester	State/Province	MA	Country of Residence	US

Mailing Address of Inventor:

Address 1	52 Upland Street		
Address 2			
City	Worcester	State/Province	MA
Postal Code	01607	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

PTO/AIA/14 (11-15)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	133077.05500
	Application Number	
Title of Invention	Grouped Mini CS Fiber Optic Connectors	

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	136404		
Email Address	docketingBN@pepperlaw.com	Add Email	Remove Email

Application Information:

Title of the Invention	Grouped Mini CS Fiber Optic Connectors		
Attorney Docket Number	133077.05500	**Small Entity Status Claimed**	☒
Application Type	Provisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	21	**Suggested Figure for Publication (if any)**	

Filing By Reference:

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

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

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

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

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

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Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	133077.05500
	Application Number	
Title of Invention	Grouped Mini CS Fiber Optic Connectors	

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
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Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)

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

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Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

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

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	133077.05500
	Application Number	
Title of Invention	Grouped Mini CS Fiber Optic Connectors	

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When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

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NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	133077.05500
	Application Number	
Title of Invention	Grouped Mini CS Fiber Optic Connectors	

Applicant Information:

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

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
● Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	Senko Advanced Components, Inc.		
Mailing Address Information For Applicant:			
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Country	US	Postal Code	01752
Phone Number		Fax Number	
Email Address			

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Assignee Information including Non-Applicant Assignee Information:

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	133077.05500
	Application Number	
Title of Invention	Grouped Mini CS Fiber Optic Connectors	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

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Signature:

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NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Alison L. McCarthy/			Date (YYYY-MM-DD)	2017-07-14
First Name	Alison	Last Name	McCarthy	Registration Number	51998

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	133077.05500
	Application Number	
Title of Invention	Grouped Mini CS Fiber Optic Connectors	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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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 CooperationTreaty.

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.

GROUPED MINI CS FIBER OPTIC CONNECTORS

BACKGROUND

[0001] The present disclosure relates generally to connectors having remote release, and more specifically to grouping compact adapters and connectors.

[0002] The prevalence of the Internet has led to unprecedented growth in communication networks. Consumer demand for service and increased competition has caused network providers to continuously find ways to improve quality of service while reducing cost.

[0003] Certain solutions have included deployment of high-density interconnect panels. High-density interconnect panels may be designed to consolidate the increasing volume of interconnections necessary to support the fast-growing networks into a compacted form factor, thereby increasing quality of service and decreasing costs such as floor space and support overhead. However, room for improvement in the area of data centers, specifically as it relates to fiber optic connects, still exits. For example manufacturers of connectors and adapters are always looking to reduce the size of the devices, while increasing ease of deployment, robustness, and modifiability after deployment.

[0004] In communication networks, such as data centers and switching networks, numerous interconnections between mating connectors may be compacted into high-density panels. Panel and connector producers may optimize for such high densities by shrinking the connector size and/or the spacing between adjacent connectors on the panel. While both approaches may be effective to increase the panel connector density, shrinking the connector size and/or spacing may also increase the support cost and diminish the quality of service.

[0005] In a high-density panel configuration, adjacent connectors and cable assemblies may obstruct access to the individual release mechanisms. Such physical obstructions may impede the ability of an operator to minimize the stresses applied to the cables and the

connectors. For example, these stresses may be applied when the user reaches into a dense group of connectors and pushes aside surrounding optical fibers and connectors to access an individual connector release mechanism with his/her thumb and forefinger. Overstressing the cables and connectors may produce latent defects, compromise the integrity and/or reliability of the terminations, and potentially cause serious disruptions to network performance.

[0006] While an operator may attempt to use a tool, such as a screwdriver, to reach into a dense group of connectors and activate a release mechanism, adjacent cables and connectors may obstruct the operator's line of sight, making it difficult to guide the tool to the release mechanism without pushing aside the adjacent cables. Moreover, even when the operator has a clear line of sight, guiding the tool to the release mechanism may be a time-consuming process. Thus, using a tool may not be effective at reducing support time and increasing the quality of service.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. 1A is a perspective view of a prior art standard 6.25mm pitch LC connector SFP;

[0008] FIG. 1B is a perspective view of a prior art standard 6.25mm pitch LC adapter;

[0009] FIG. 1C is a top view of the prior art adapter of FIG. 1B;

[0010] FIG. 1D is a front view of the prior art adapter of FIG. 1B, showing the 6.25mm pitch;

[0011] FIG. 2A is a perspective view of a prior art LC duplex connector;

[0012] FIG. 2B is a perspective view of a prior art LC duplex connector with a remote release pull tab;

[0013] FIG. 2C is a top view of a prior art LC connector used in the embodiments shown in FIGS. 2A and 2B;

[0014] FIG. 2D is a side view of the prior art LC connector of FIG. 2C;

[0015] FIG. 3 is a exploded view of one embodiment of a CS connector;

[0016] FIG. 4 is a perspective view of one embodiment of a CS connector;

[0017] FIG. 5 is a perspective view of one embodiment of a CS connector with the outer housing removed from the front body.

[0018] FIG. 6 is a perspective view of one embodiment of a duplex CS connector;

[0019] FIG. 7 is a perspective view of another embodiment of a duplex CS connector;

[0020] FIG. 8 is a perspective of one embodiment of a quad CS connector;

[0021] FIG. 9 is a perspective of another embodiment of a quad CS connector;

[0022] FIG. 10 is a perspective of another embodiment of a quad CS connector;

[0023] FIG. 11 is a perspective of one embodiment of a quad CS connector inserted into a corresponding adapter;

[0024] FIGs. 12A-C are illustrative examples of cable management using various embodiments of CS connectors;

[0025] FIG. 13A-B are illustrative examples of cable management using multiple fiber strands per jacket;

[0026] FIG. 14 is an illustrative example of using a cable management system using multiple fiber strands per jacket.

[0027] FIG. 15 is another illustrative example of using a cable management system using multiple fiber strands per jacket.

[0028] FIG. 16A-B are various views of one embodiment of a MT connector.

[0029] FIGs. 17A-D are illustrative examples of possible alternative connector designs.

[0030] FIGs. 18A-B are illustrative examples of additional possible alternative connector designs.

[0031] FIG. 19 is an illustrative examples of a method of switching modes of operation of one or more connectors.

DETAILED DESCRIPTION

[0032] This disclosure is not limited to the particular systems, devices and methods described, as these may vary. The terminology used in the description is for the purpose of describing the particular versions or embodiments only, and is not intended to limit the scope.

[0033] As used in this document, the singular forms "a," "an," and "the" include plural references unless the context clearly dictates otherwise. Unless defined otherwise, all technical and scientific terms used herein have the same meanings as commonly understood by one of ordinary skill in the art. Nothing in this disclosure is to be construed as an admission that the embodiments described in this disclosure are not entitled to antedate such disclosure by virtue of prior invention. As used in this document, the term "comprising" means "including, but not limited to."

[0034] The following terms shall have, for the purposes of this application, the respective meanings set forth below.

[0035] A connector, as used herein, refers to a device and/or components thereof that connects a first module or cable to a second module or cable. The connector may be configured for fiber optic transmission or electrical signal transmission. The connector may be any suitable type now known or later developed, such as, for example, a ferrule connector (FC), a fiber distributed data interface (FDDI) connector, an LC connector, a mechanical transfer (MT) connector, a square connector (SC) connector, an SC duplex connector, or a straight tip (ST)

connector. The connector may generally be defined by a connector housing body. In some embodiments, the housing body may incorporate any or all of the components described herein.

[0036] A "fiber optic cable" or an "optical cable" refers to a cable containing one or more optical fibers for conducting optical signals in beams of light. The optical fibers can be constructed from any suitable transparent material, including glass, fiberglass, and plastic. The cable can include a jacket or sheathing material surrounding the optical fibers. In addition, the cable can be connected to a connector on one end or on both ends of the cable.

[0037] Various embodiments described herein generally provide a remote release mechanism such that a user can remove cable assembly connectors that are closely spaced together on a high density panel without damaging surrounding connectors, accidentally disconnecting surrounding connectors, disrupting transmissions through surrounding connectors, and/or the like. Various embodiments also provide narrow pitch LC duplex connectors and narrow width multi-fiber connectors, for use, for example, with future narrow pitch LC SFPs and future narrow width SFPs. The remote release mechanisms allow use of the narrow pitch LC duplex connectors and narrow width multi-fiber connectors in dense arrays of narrow pitch LC SFPs and narrow width multi-fiber SFPs.

[0038] FIG. 1A shows a perspective view of a prior art standard 6.25mm pitch LC connector SFP 100. The SFP 100 is configured to receive a duplex connector and provides two receptacles 102, each for receiving a respective LC connector. The pitch 104 is defined as the axis-to-axis distance between the central longitudinal axes of each of the two receptacles 102. FIG. 1B shows a perspective view of a prior art standard 6.25 mm pitch LC adapter 106. The adapter 106 is also configured to receive a duplex connector, and provides two receptacles 108, each for receiving a respective LC connector. FIG. 1C is a top view of the adapter 106 of FIG.

1B. The pitch of the adapter 106 is defined similarly to that of the SFP 100, as the axis-to-axis distance between the central longitudinal axes of each of the two receptacles 108, as illustrated in FIG. 1D, which shows a front view of the adapter 106.

[0039] FIG. 2A shows a prior art LC duplex connector 200 that may be used with the conventional SFP 100 and the conventional adapter 106. The LC duplex connector 200 includes two conventional LC connectors 202. FIG. 2B shows another prior art LC duplex connector 204 having a remote release pull tab 206, and including two conventional LC connectors 208. As shown, the remote release pull tab includes two prongs 210, each configured to couple to the extending member 212 of a respective LC connector 208. FIGS. 2C and 2D show top and side views, respectively, of the conventional LC connector 208, having a width of 5.6 mm, and further showing the extending member 212.

[0040] As discussed herein, current connectors may be improved by various means, such as, for example, reducing the footprint, increasing the structural strength, enabling polarity changes easily, etc. Various embodiments disclosed herein offer improvements over the current state of the art, as will be further discussed below.

[0041] In some embodiments, as shown in FIG. 3, a CS connector 300 may comprise various components. Referring to FIG. 3, an illustrative embodiment of a CS connector 300 is shown in an exploded view to display detail. In some embodiments, and as discussed further herein, a CS connector 300 may have an outer housing 301, a front body 302, one or more ferrules 303, one or more ferrule flanges 304, one or more springs 305, a back body 306, a back post 307, a crimp ring 308, a boot 309, and a push-pull tab 310. In some embodiments, the back body 306 may comprise one or more protrusions 306.1 which may interlock with a window/cutout 302.1 in the front body 302. This may allow for the back body 306 and the front

body 302 to be securely fastened together around the ferrule(s) 303, ferrule flange(s) 304, and the spring(s) 305.

[0042] Referring now to FIG. 4, an embodiment is shown wherein the CS connector 400 is assembled. In some embodiments, the assembled CS connector may have an outer housing 401, a front body (not shown, see FIGs. 3 and 5.), one or more ferrules 403, one or more ferrule flanges (not shown), one or more springs (not shown), a back body 406, a back post (not shown), a crimp ring (not shown), a boot 409, a push-pull tab 410, and one or more latching mechanisms made up of a window 412 on the outer housing and a protrusion 413 on the front body. The latching mechanism 412 and 413 securely attaches the outer housing 401 to the front body. In a further embodiment, the push-pull tab 410 may have an opening to receive a locking tab 411. The locking tab 411 of the outer housing 401 is used to interlock with an adapter (not shown) to secure the CS connector into the adapter. As would be understood by one skilled in the art, the push-pull tab 410 enables easy manipulation of the locking tab 411 to allow for removal of the CS connector from the adapter without requiring additional tools.

[0043] As shown in FIG. 5, in some embodiments, the latching mechanism of the SC connector 500 may be made up of two parts: a window 512 and a protrusion 513. As illustrated in FIG. 5, the outer housing 501 can slide on to or be removed from the front body 502 by disengaging the latching mechanisms formed by the protrusion 513 exiting through the window 512, whereby it contacts a side wall of the window (refer to FIG. 4 for an illustrated example of the outer housing being attached to the front body via the latching mechanism). In some embodiments, the push-pull tab 510 may also be detached from the outer housing 501, as shown.

[0044] In a further embodiment, the front body 502 may be removed from the outer housing 501, rotated 180°, and re-inserted into the outer housing. This allows for a change in the

polarity of the front body 502, as shown by the arrow diagram in FIG. 5, and therefore the ferrules can switch quickly and easily without unnecessarily risking the delicate fiber cables and ferrules.

[0045] In some embodiments, it may be beneficial to connect two or more SC connectors together to increase structural integrity, reduce the overall footprint, and cut manufacturing costs. Accordingly, as shown in FIG. 6, an SC connector 600 may in some embodiments, utilize an outer housing 601 that is capable of holding two front bodies (not shown). Various other embodiments are disclosed herein, and it should be noted that the embodiments disclosed herein are all non-limiting examples shown for explanatory purposes only.

[0046] Accordingly, although the embodiment shown in FIG. 6 utilizes a duplex outer housing 601, additional or alternative embodiments may exist with more capacity. As shown in FIG. 6, in some embodiments, the outer housing 601 may accept two front bodies (not shown), each with two separate ferrules 603. As shown, the front body (not shown) may securely fasten to the outer housing 601 via the latching mechanism 612 and 613. In additional embodiments, the push-pull tab 610 may be modified, as shown, such that a single tab can be used to free the two or more SC connectors from an adapter. As illustrated in FIG. 6, the push-pull tab 610 may include two openings with which to receive multiple locking tabs 611 of the outer housing 601. As discussed herein the locking tabs 611 of the outer housing 601 are used to secure the CS connectors to an adapter (not shown). In one or more further embodiments, the SC connectors may have individual back bodies 606 and boots 609 (i.e., one back body/boot per front body) as shown.

[0047] Alternatively, in some embodiments, such as that shown in FIG. 7, the SC connector 700 may have a single boot 709 and a duplex (i.e., uni-body) back body 706 instead of individual back bodies (e.g., such as shown in FIG. 6). In some embodiments, the duplex back body 706 may have different dimensions than that of the individual back bodies of FIG. 6, such as, for example, they may be longer to accommodate the need for routing the fiber after it exits the boot 709. As with other embodiments discussed herein, the SC connector shown in FIG. 7 may also include an outer housing (e.g., duplex outer housing) 701, one or more ferrules 703, at least one latching mechanism formed by the protrusion 713 exiting through the window 712, and push-pull tab 710.

[0048] As stated, it may be beneficial to connect two or more SC connectors together to increase structural integrity, reduce the overall footprint, and cut manufacturing costs. Accordingly, similarly to FIG. 6, FIG. 8 shows an SC connector 800 that may, in some embodiments, utilize an outer housing 801 that is capable of holding multiple (e.g., four) front bodies (not shown).

[0049] As shown in FIG. 8, some embodiments may have an outer housing 801 able to accept up to four front bodies, each with one or more ferrules 803. As shown, each front body (not shown) may securely fasten to the outer housing 801 via the latching mechanism 812 and 813. In additional embodiments, the push-pull tab 810 may be modified, as shown, such that a single tab can be used to free the up to four SC connectors from an adapter. As illustrated in FIG. 8, the push-pull tab 810 may include four openings with which to receive multiple locking tabs 811 of the outer housing 801. As discussed herein the locking tabs 811 of the outer housing 801 are used to secure the SC connectors to an adapter (not shown). In one or more further

embodiments, the SC connectors may have individual back bodies 806 and boots 809 (i.e., one back body/boot per front body) as shown.

[0050] Alternatively, in some embodiments, such as that shown in FIG 9, the SC connector 900 may utilize one or more duplex back bodies 906 with a single boot 909, similar to that shown in FIG. 7. Thus, similar to FIG. 7, the embodiment shown in FIG. 9 may allow for a further reduced foot print, less cabling, and easier maintenance of the SC connector. Accordingly, one or more embodiments may have an outer housing 901 may accept up to four front bodies, each with one or more ferrules 903. As shown, each front body (not shown) may securely fasten to the outer housing 901 via the latching mechanism 912 and 913. In additional embodiments, the push-pull tab 910 may be modified, as shown, such that a single tab can be used to free the up to four front bodies from an adapter. As illustrated in FIG. 9, the push-pull tab 910 may include four openings with which to receive multiple locking tabs 911 of the outer housing 901. As discussed herein the locking tabs 911 of the outer housing 901 are used to secure the SC connectors to an adapter (not shown).

[0051] In further embodiments, such as that shown in FIG.10, the SC connector 1000 may utilize a single uni-body back body 1006 with a single boot 1009. Thus, the embodiment shown in FIG. 9 may allow for a further reduced foot print, even less cabling, and easier maintenance of the SC connector. Accordingly, one or more embodiments may have an outer housing 1001 that may accept up to four front bodies, each with one or more ferrules 1003. As shown, each front body (not shown) may securely fasten to the outer housing 1001 via the latching mechanism 1012 and 1013. In additional embodiments, the push-pull tab 1010 may be modified, as shown, such that a single tab can be used to free up to four SC connectors from an adapter. As illustrated in FIG. 10, the push-pull tab 1010 may include four openings with which

to receive multiple locking tabs 1011 of the outer housing 1001. As discussed herein the locking tabs 1011 of the outer housing 1001 are used to secure the SC connectors to an adapter (not shown).

[0052] Referring now to FIG. 11, an embodiment 1100 is shown in which the SC connector (not shown in its entirety) is inserted into an adapter 1114. In this specific non-limiting example, the SC connector is similar to that shown in FIG. 8 (i.e., comprising four front bodies each with their own back body 1106 and boot 1109). However, unlike FIG. 8, the embodiment shown here utilizes four individual push-pull tabs 1110 instead of a single push-pull tab which manipulates four latching tabs to allow the SC connector to be removed from the adapter 1114.

[0053] Various benefits and details have been discussed herein with regard to the SC connectors and their modular ability (e.g., to include multiple connectors into a single unit). In addition to the reduced footprint, structural improvements, and cost reduction, various embodiments herein may also be beneficial with regard to reducing the burden of cabling in a data center environment. Illustrative embodiments shown in FIGs. 12A through 12C depict cable configurations that can be used to reduce the complexity of optical cables in a compact environment. FIG. 12A shows two duplex cables similar to the cable shown in FIG. 6. This allows for two or more cables to be bundled and reduce the risk of entanglement with additional cables. FIG. 12B is an illustrative example, of how easily an embodiment can separate into two individual SC connectors by unbinding the cables and thus quickly and easily creating two independent fiber optic channels that can move independently. FIG. 12C shows an embodiment in which a duplex SC connector like that of FIGs. 6 and 12A is connected to two separate individual SC connectors.

[0054] In addition to binding existing fiber cables, some embodiments herein may utilize a new four fiber zip cable. Referring now to FIG. 13A, a conventional zip cable (i.e., one with a single fiber strand 1320 per jacket 1321) is shown in comparison with an embodiment where two fibers 1322 per jacket 1323 may be utilized. It should be understood that this is merely a non-limiting example. In some embodiments, multiple fibers may be included per jacket, such as, for example, four fibers per jacket in order to utilize the single boot 1009 and uni-body read body 1006 of the SC connector shown in FIG. 10.

[0055] A specific example using multi-strand cables is shown in FIG. 14 for illustrative purposes only. It should be understood that numerous alternatives and modifications are possible, such as, for example, that shown in FIG. 16A-16B, FIGs. 17A-17D, and 18A-18B. As shown, a switch (e.g., 100G switch) 1430 is shown with a transceiver (e.g., 100G transceiver) 1431. The transceiver 1431 has an adapter to receive two mini CS duplex connectors 1432. From each of the two duplex connectors 1432, a four fiber cable 1433 extends to connect to various other connectors and transceivers. As shown, one four fiber cable 1433 is split into two two-fiber cables 1434, which are then attached to a single CS simplex connector 1435 and placed into a transceiver (e.g., 25G transceiver) 1436. As further shown, one of the four fiber cables 1437 is connected to a single mini CS duplex connector 1438, which is then inserted into another transceiver (e.g., 50G transceiver) 1439.

[0056] Accordingly, embodiments described herein allow for improvements over the current state of the art. By way of specific example, ROX connectors generally have three types of fixed cables: ROX 1, ROX 2, and ROX 4. Moreover, ROX cables are bifurcated. As such, the cable cannot be split once installed and the polarity of the cables cannot be changed. Alternatively, the embodiments discussed herein may allow a user to change from a four way to

a 2-Duplex, to a 4-simplex connector, etc. (e.g., FIG. 19). Moreover, as discussed herein, the individual CS connectors can be split into individual connectors anytime, even after deployment. Additionally, as discussed herein, the polarity can be changed within the CS connectors in an easy manner that does not risk damage to the one or more ferrules. It should also be noted, as discussed herein that CS connectors are used herein merely for simplicity purposes, and that various other connectors may be used in any embodiment (e.g., an MT connector, such as that shown in FIG. 16A-16B).

[0057] In the above detailed description, reference is made to the accompanying drawings, which form a part hereof. In the drawings, similar symbols typically identify similar components, unless context dictates otherwise. The illustrative embodiments described in the detailed description, drawings, and claims are not meant to be limiting. Other embodiments may be used, and other changes may be made, without departing from the spirit or scope of the subject matter presented herein. It will be readily understood that the aspects of the present disclosure, as generally described herein, and illustrated in the Figures, can be arranged, substituted, combined, separated, and designed in a wide variety of different configurations, all of which are explicitly contemplated herein.

[0058] The present disclosure is not to be limited in terms of the particular embodiments described in this application, which are intended as illustrations of various aspects. Many modifications and variations can be made without departing from its spirit and scope, as will be apparent to those skilled in the art. Functionally equivalent methods and apparatuses within the scope of the disclosure, in addition to those enumerated herein, will be apparent to those skilled in the art from the foregoing descriptions. Such modifications and variations are intended to fall within the scope of the appended claims. The present disclosure is to be limited

only by the terms of the appended claims, along with the full scope of equivalents to which such claims are entitled. It is to be understood that this disclosure is not limited to particular methods, reagents, compounds, compositions or biological systems, which can, of course, vary. It is also to be understood that the terminology used herein is for the purpose of describing particular embodiments only, and is not intended to be limiting.

[0059] With respect to the use of substantially any plural and/or singular terms herein, those having skill in the art can translate from the plural to the singular and/or from the singular to the plural as is appropriate to the context and/or application. The various singular/plural permutations may be expressly set forth herein for sake of clarity.

[0060] It will be understood by those within the art that, in general, terms used herein, and especially in the appended claims (for example, bodies of the appended claims) are generally intended as "open" terms (for example, the term "including" should be interpreted as "including but not limited to," the term "having" should be interpreted as "having at least," the term "includes" should be interpreted as "includes but is not limited to," et cetera). While various compositions, methods, and devices are described in terms of "comprising" various components or steps (interpreted as meaning "including, but not limited to"), the compositions, methods, and devices can also "consist essentially of" or "consist of" the various components and steps, and such terminology should be interpreted as defining essentially closed-member groups. It will be further understood by those within the art that if a specific number of an introduced claim recitation is intended, such an intent will be explicitly recited in the claim, and in the absence of such recitation no such intent is present. For example, as an aid to understanding, the following appended claims may contain usage of the introductory phrases "at least one" and "one or more" to introduce claim recitations. However, the use of such phrases should not be construed to

imply that the introduction of a claim recitation by the indefinite articles "a" or "an" limits any particular claim containing such introduced claim recitation to embodiments containing only one such recitation, even when the same claim includes the introductory phrases "one or more" or "at least one" and indefinite articles such as "a" or "an" (for example, “a” and/or “an” should be interpreted to mean “at least one” or “one or more”); the same holds true for the use of definite articles used to introduce claim recitations. In addition, even if a specific number of an introduced claim recitation is explicitly recited, those skilled in the art will recognize that such recitation should be interpreted to mean at least the recited number (for example, the bare recitation of "two recitations," without other modifiers, means at least two recitations, or two or more recitations). Furthermore, in those instances where a convention analogous to “at least one of A, B, and C, et cetera” is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (for example, “ a system having at least one of A, B, and C” would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, et cetera). In those instances where a convention analogous to “at least one of A, B, or C, et cetera” is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (for example, “ a system having at least one of A, B, or C” would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, et cetera). It will be further understood by those within the art that virtually any disjunctive word and/or phrase presenting two or more alternative terms, whether in the description, claims, or drawings, should be understood to contemplate the possibilities of including one of the terms, either of the terms, or

both terms. For example, the phrase "A or B" will be understood to include the possibilities of "A" or "B" or "A and B."

[0061] In addition, where features or aspects of the disclosure are described in terms of Markush groups, those skilled in the art will recognize that the disclosure is also thereby described in terms of any individual member or subgroup of members of the Markush group.

[0062] As will be understood by one skilled in the art, for any and all purposes, such as in terms of providing a written description, all ranges disclosed herein also encompass any and all possible subranges and combinations of subranges thereof. Any listed range can be easily recognized as sufficiently describing and enabling the same range being broken down into at least equal halves, thirds, quarters, fifths, tenths, et cetera As a non-limiting example, each range discussed herein can be readily broken down into a lower third, middle third and upper third, et cetera As will also be understood by one skilled in the art all language such as "up to," "at least," and the like include the number recited and refer to ranges which can be subsequently broken down into subranges as discussed above. Finally, as will be understood by one skilled in the art, a range includes each individual member. Thus, for example, a group having 1-3 cells refers to groups having 1, 2, or 3 cells. Similarly, a group having 1-5 cells refers to groups having 1, 2, 3, 4, or 5 cells, and so forth.

[0063] Various of the above-disclosed and other features and functions, or alternatives thereof, may be combined into many other different systems or applications. Various presently unforeseen or unanticipated alternatives, modifications, variations or improvements therein may be subsequently made by those skilled in the art, each of which is also intended to be encompassed by the disclosed embodiments.

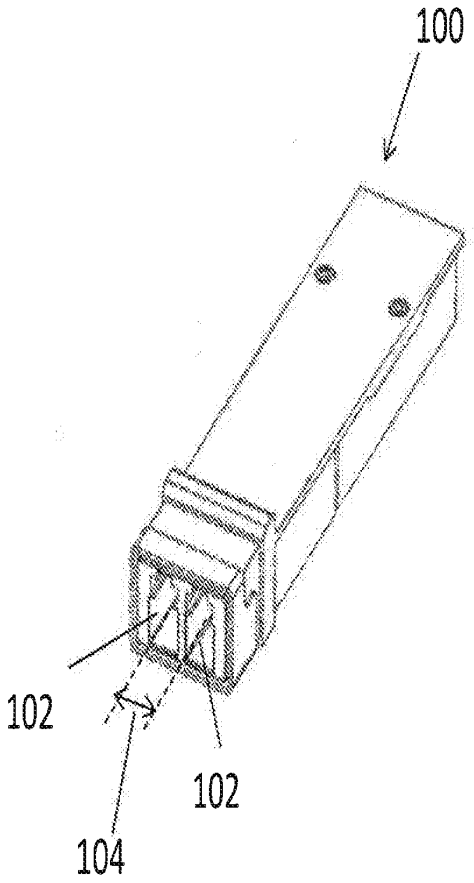


FIG. 1A
(Prior Art)

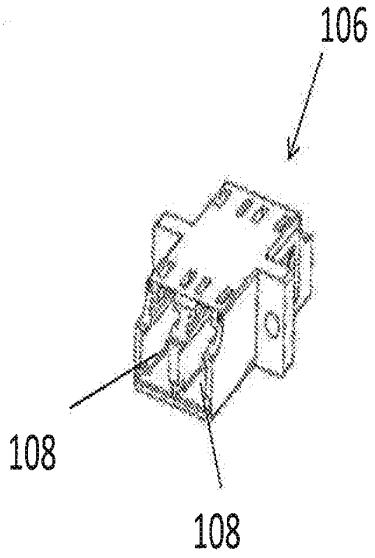


FIG. 1B
(Prior Art)

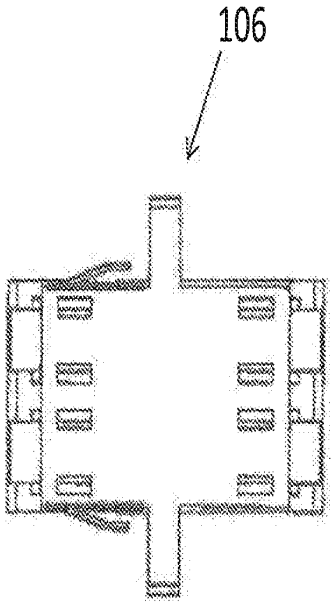


FIG. 1C
(Prior Art)

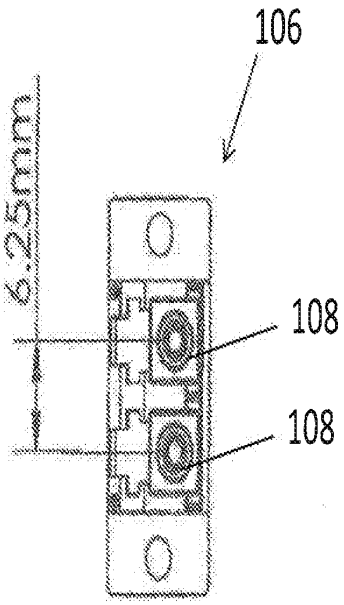


FIG. 1D
(Prior Art)

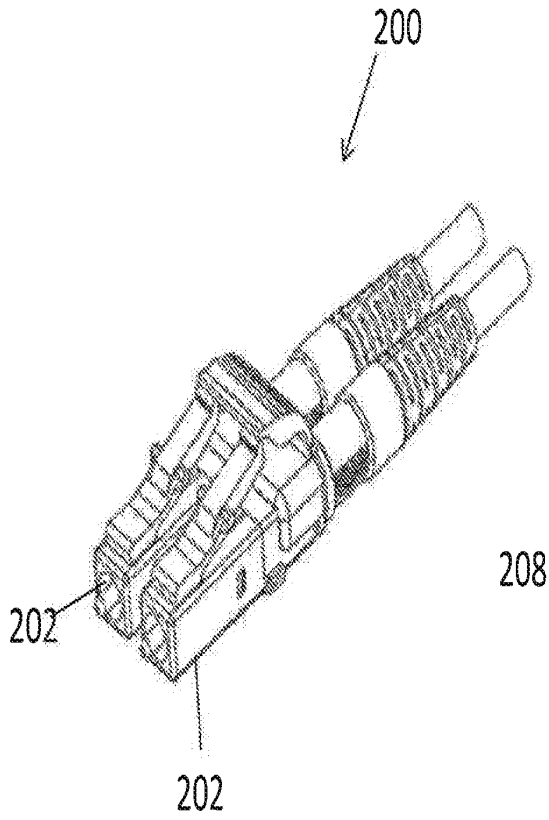


FIG. 2A
(Prior Art)

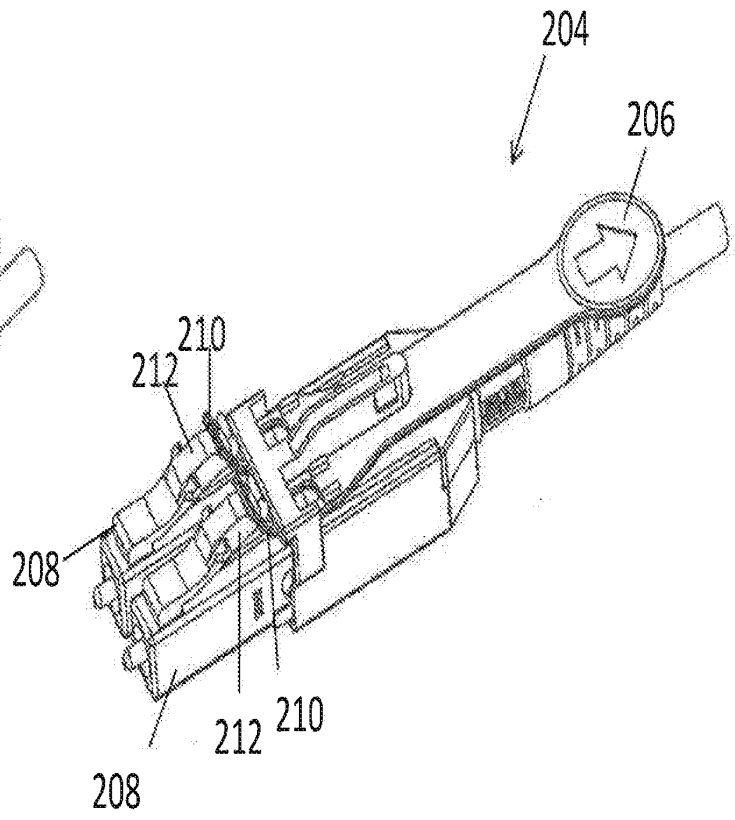


FIG. 2B
(Prior Art)

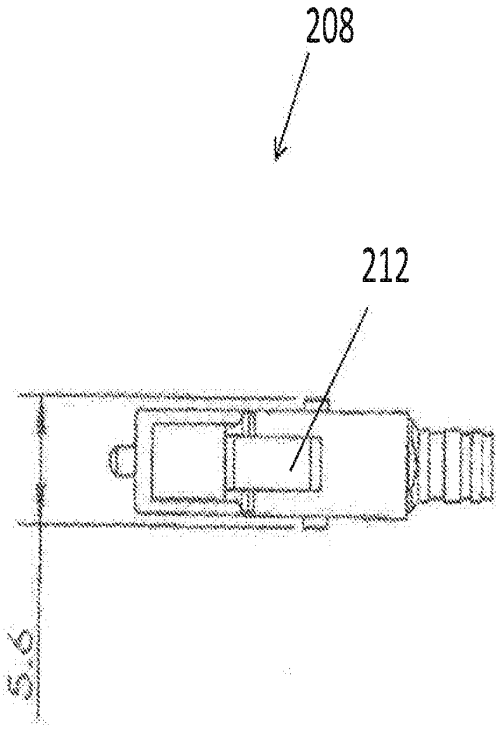


FIG. 2C
(Prior Art)

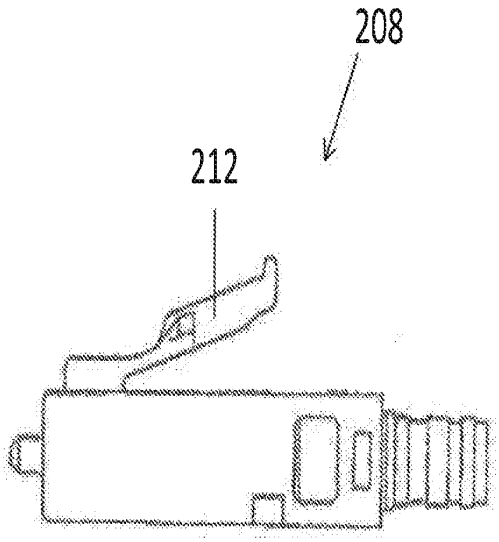


FIG. 2D
(Prior Art)

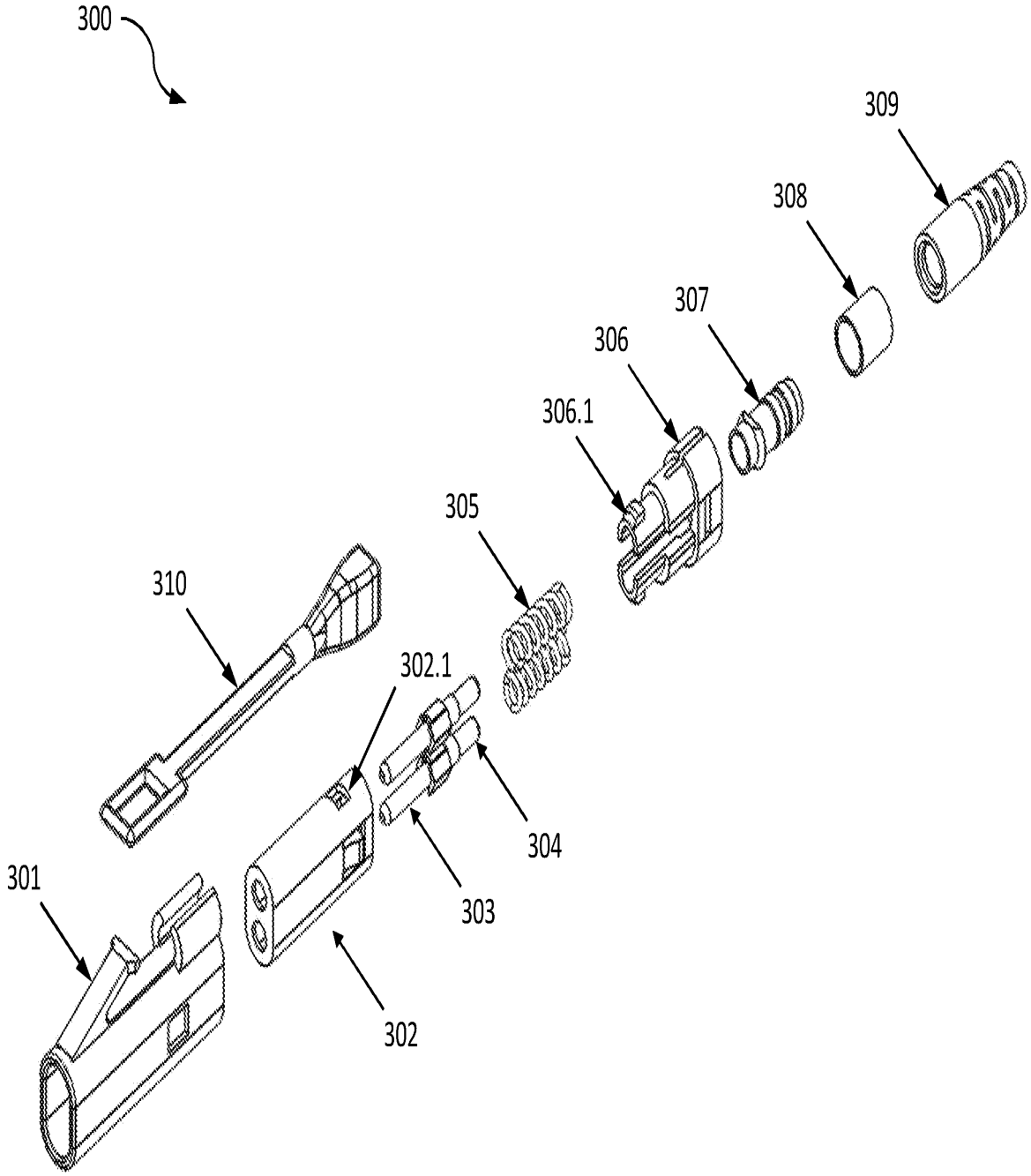


FIG. 3

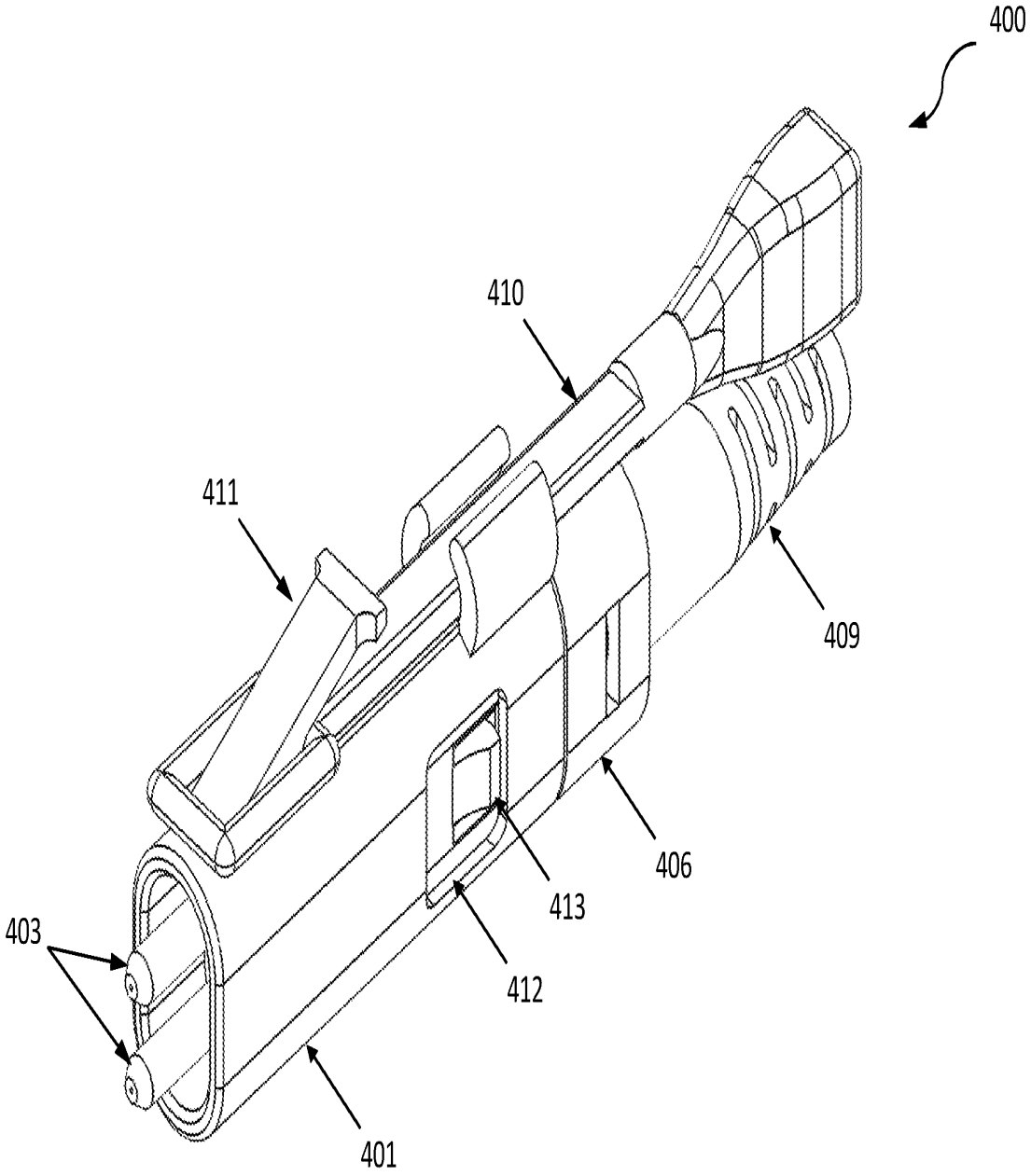


FIG. 4

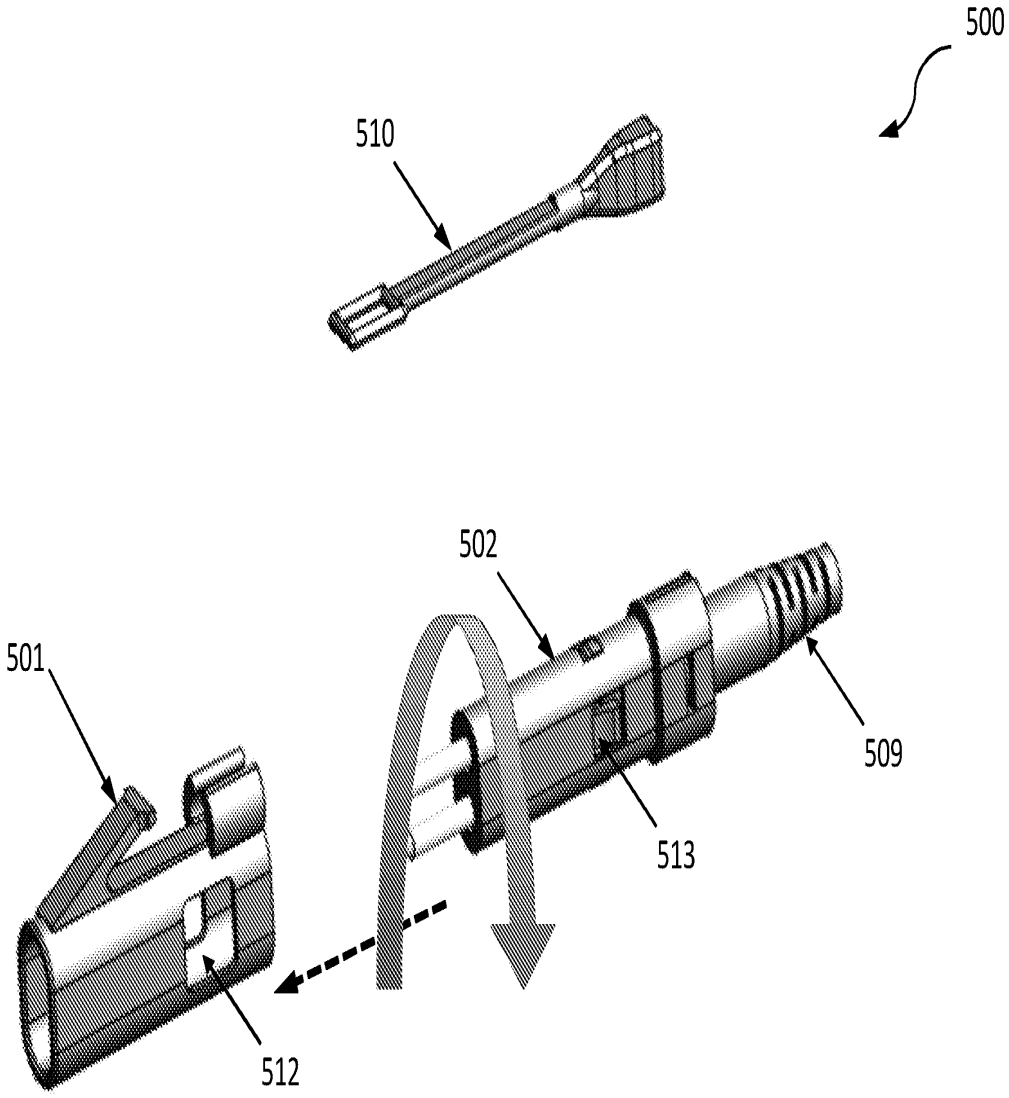


FIG. 5

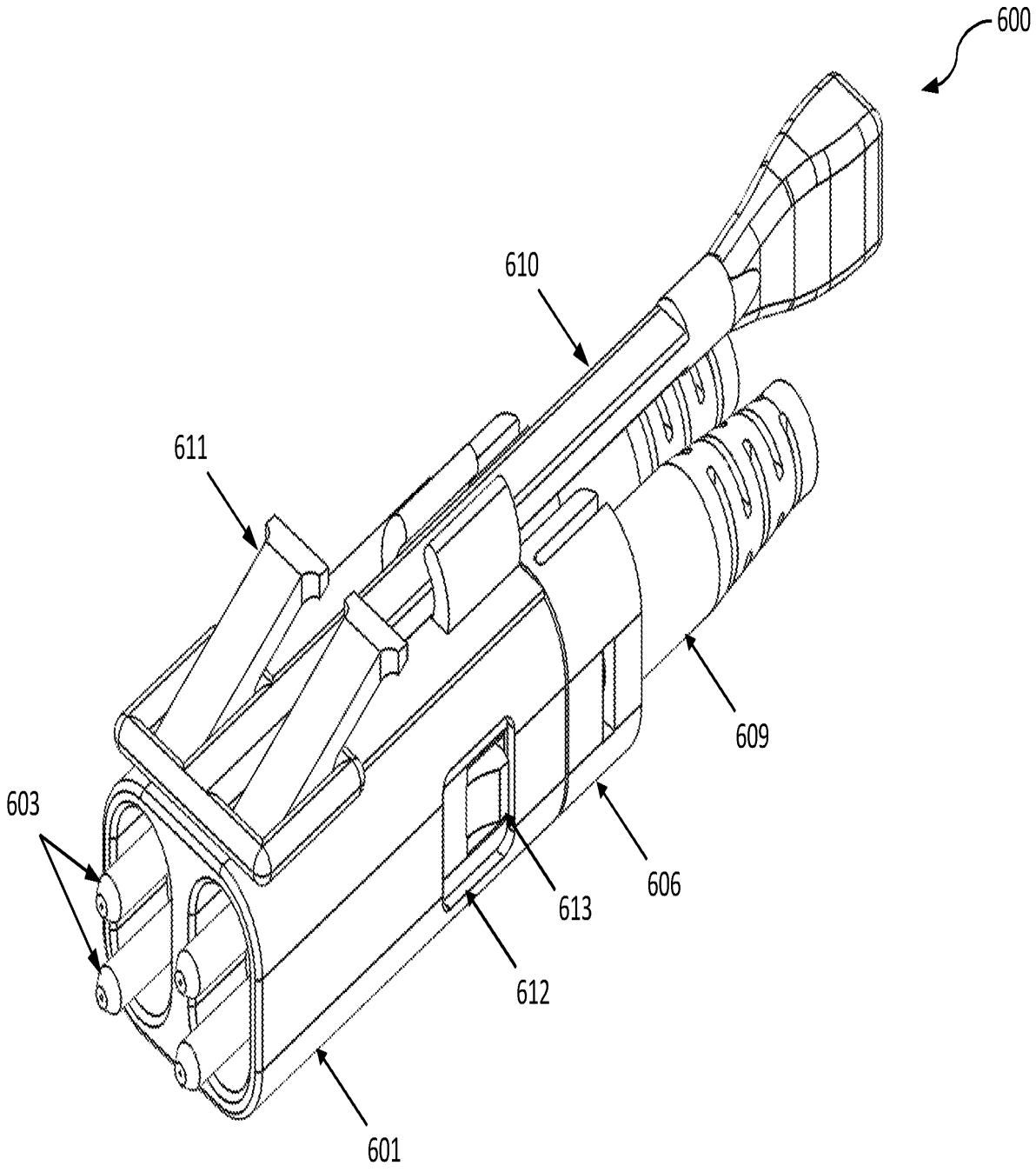


FIG. 6

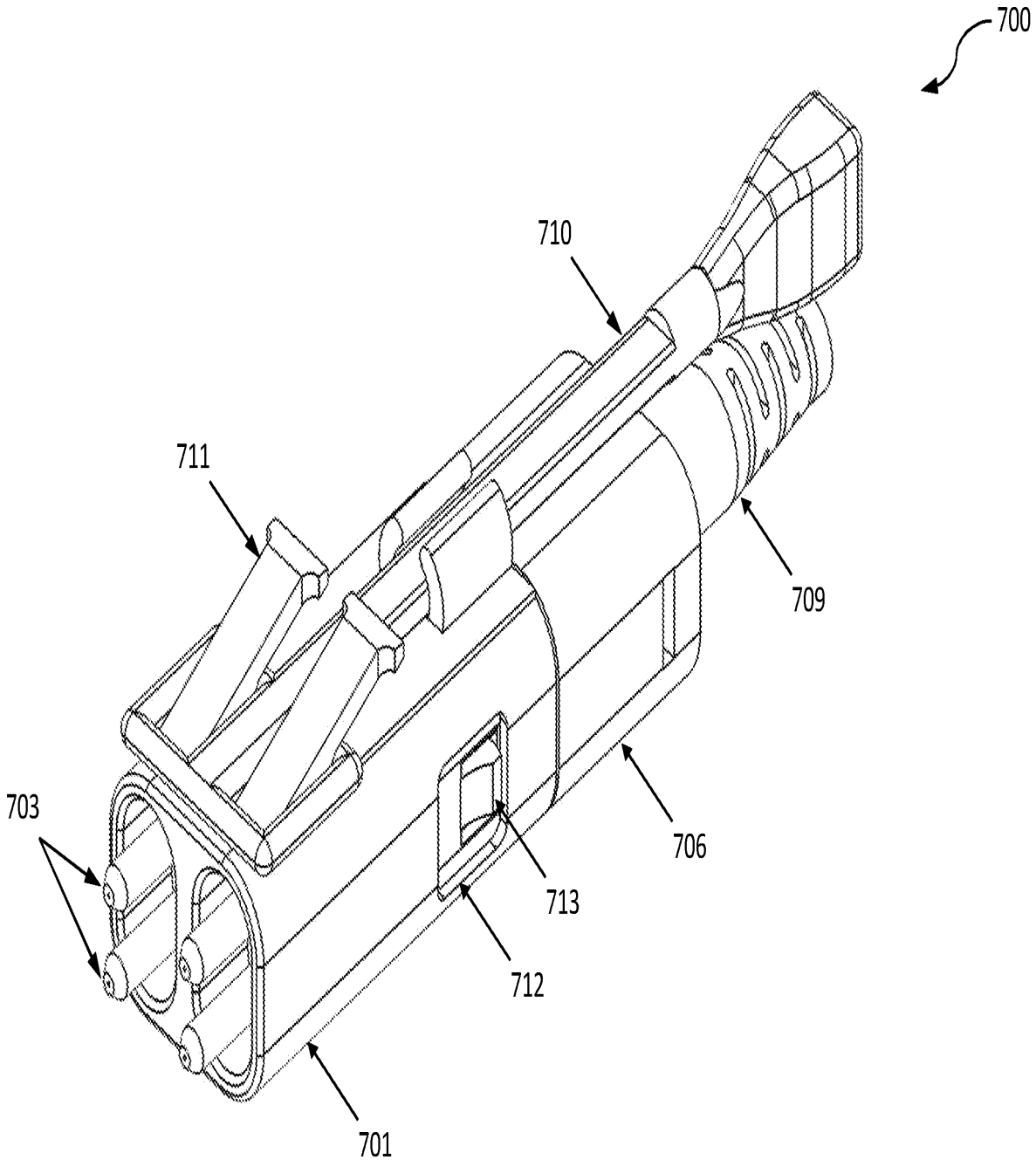


FIG. 7

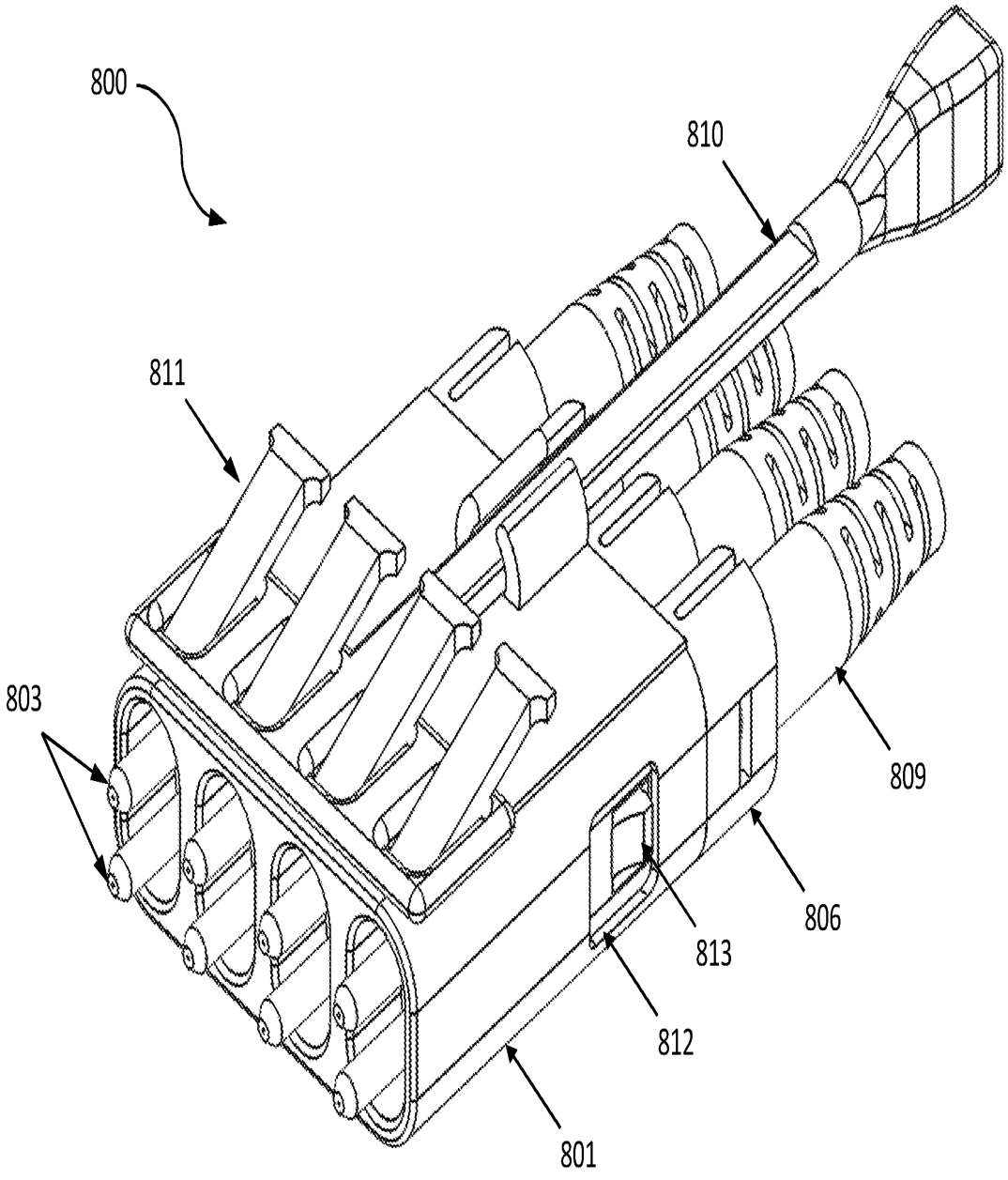


FIG. 8

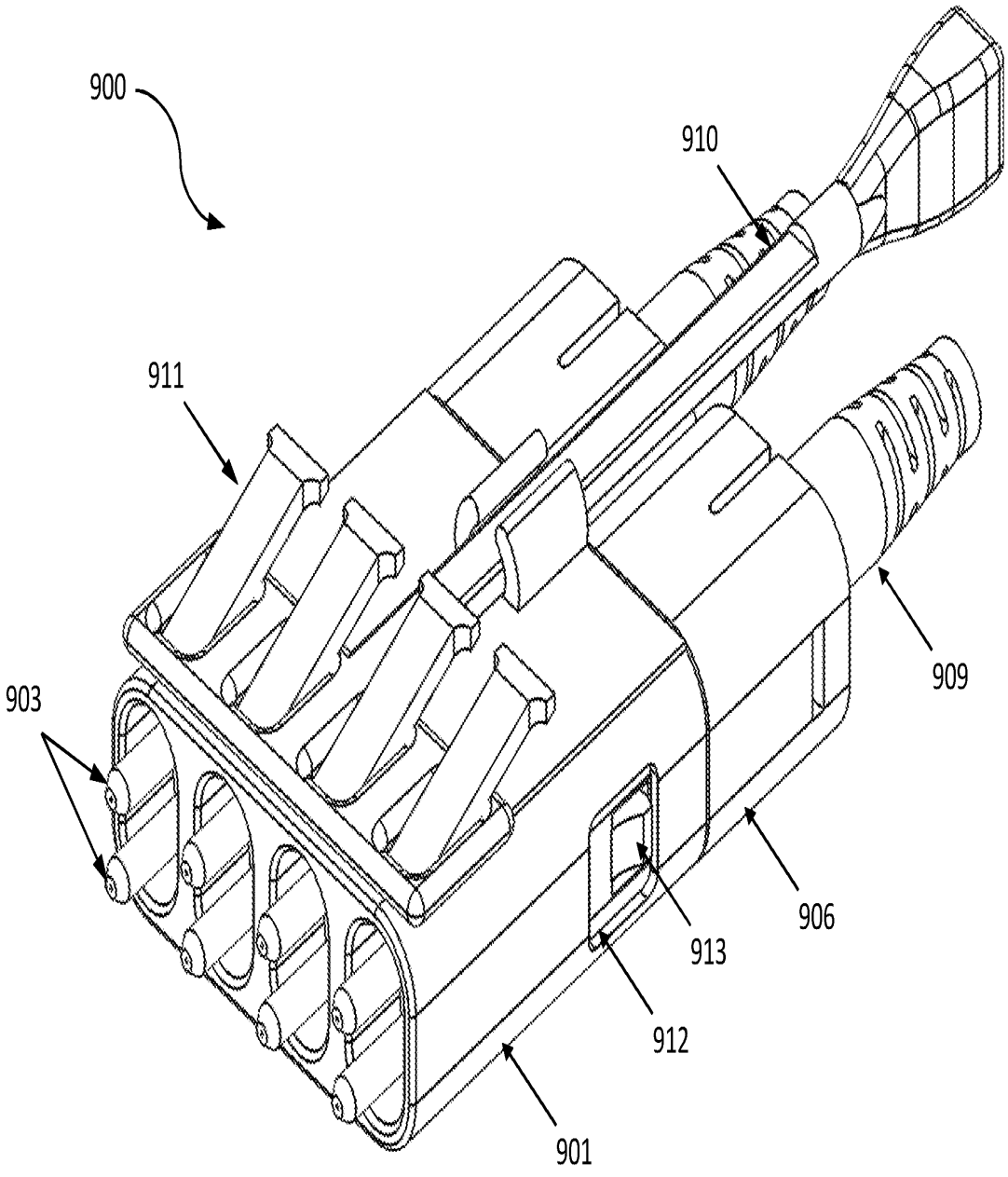


FIG. 9

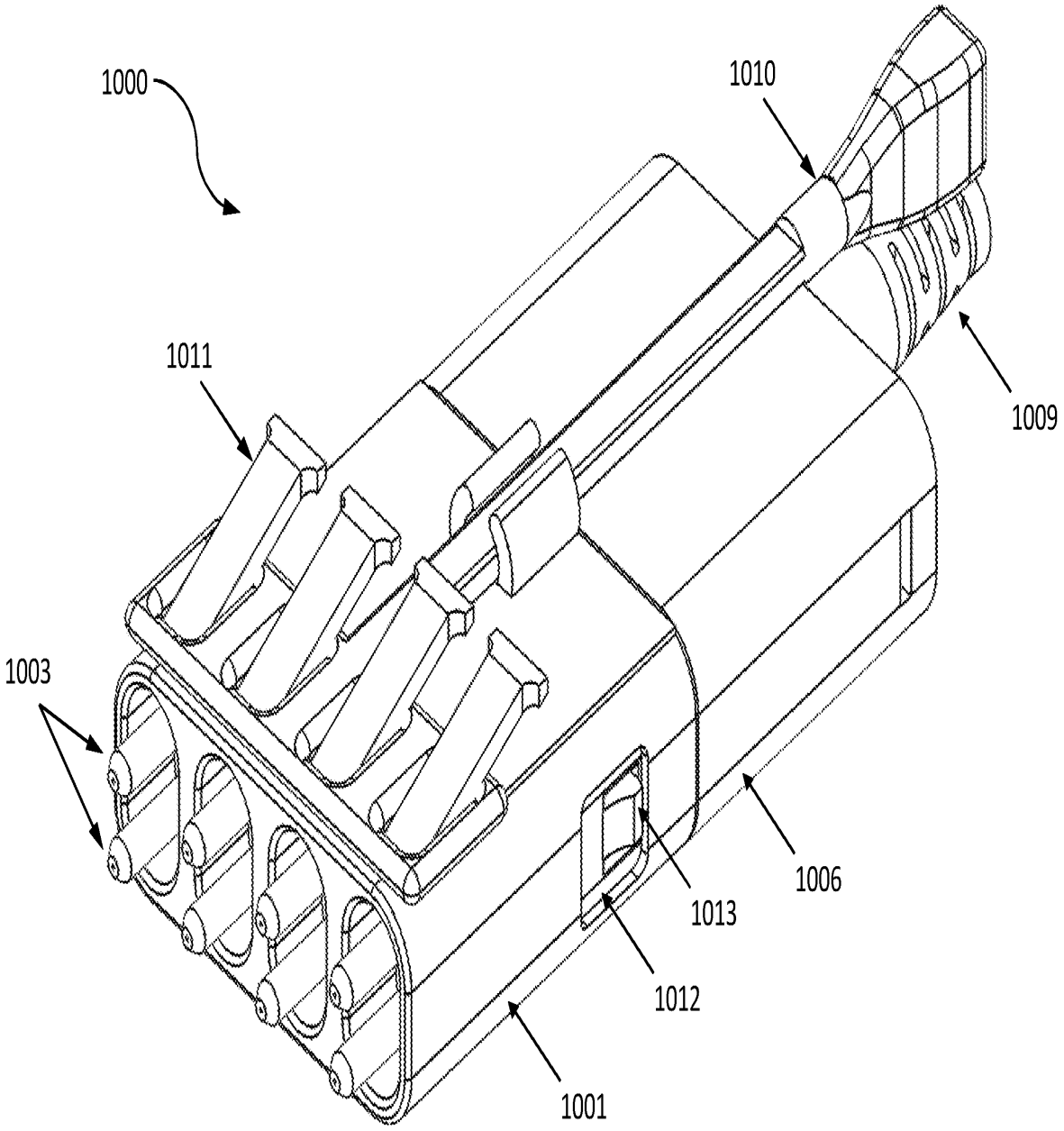


FIG. 10

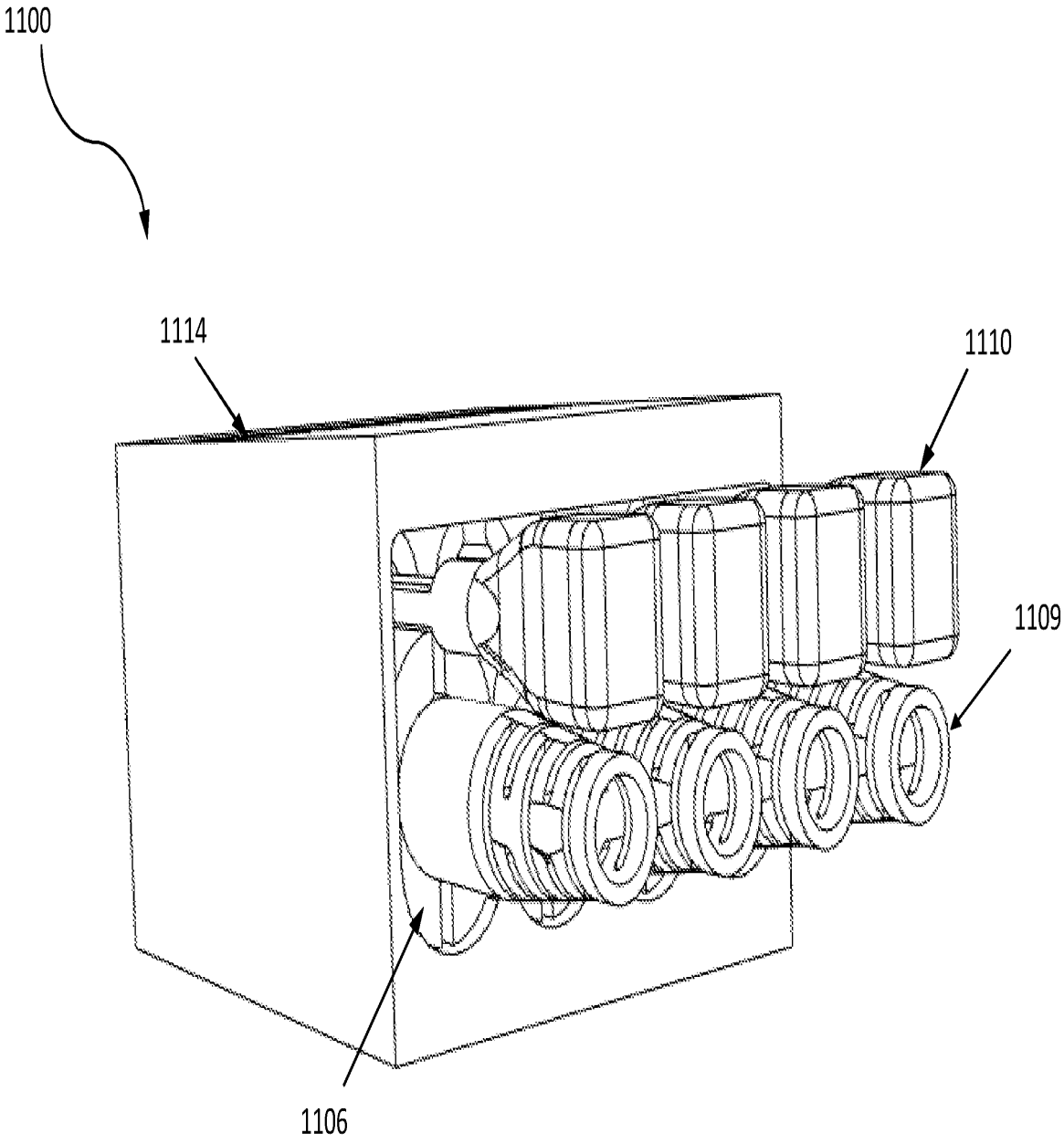


FIG. 11

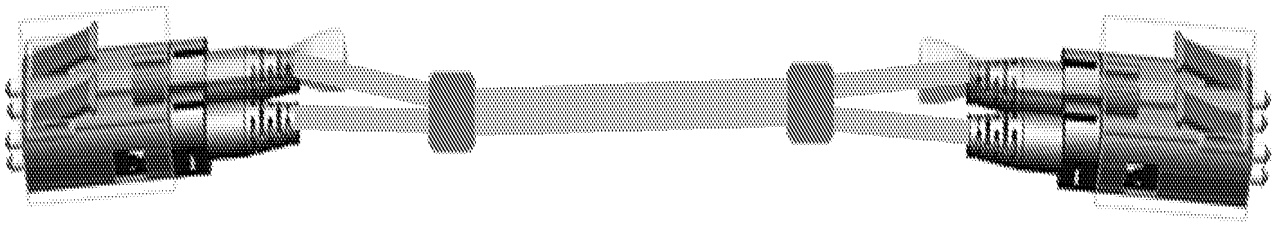


FIG. 12A

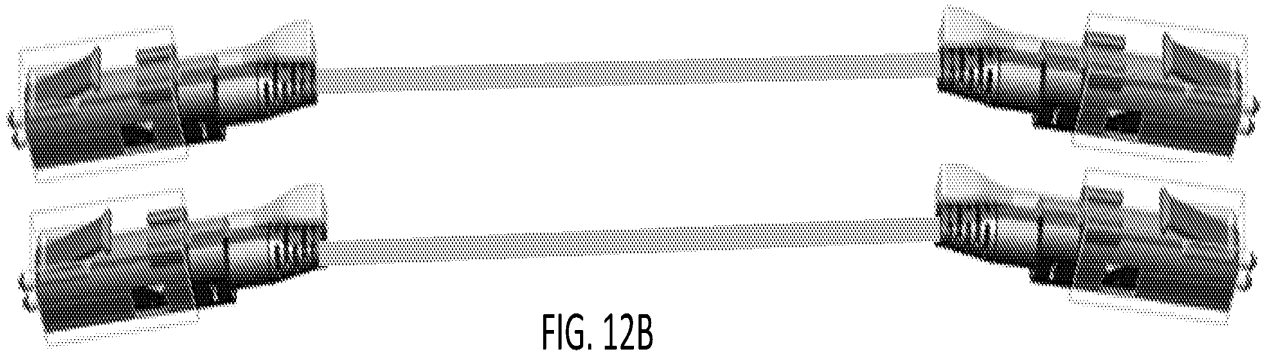


FIG. 12B

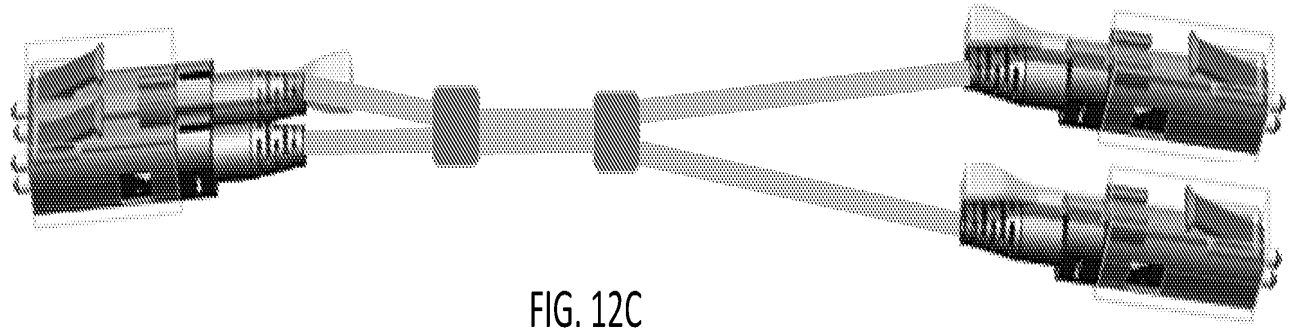


FIG. 12C

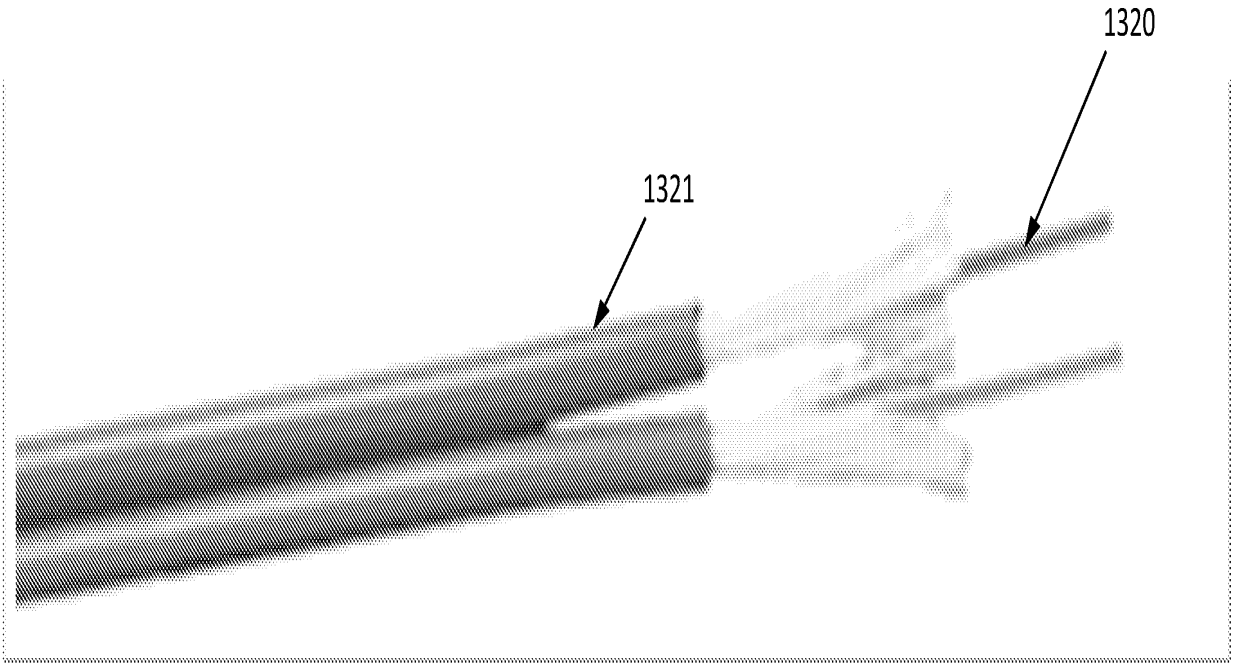


FIG. 13A

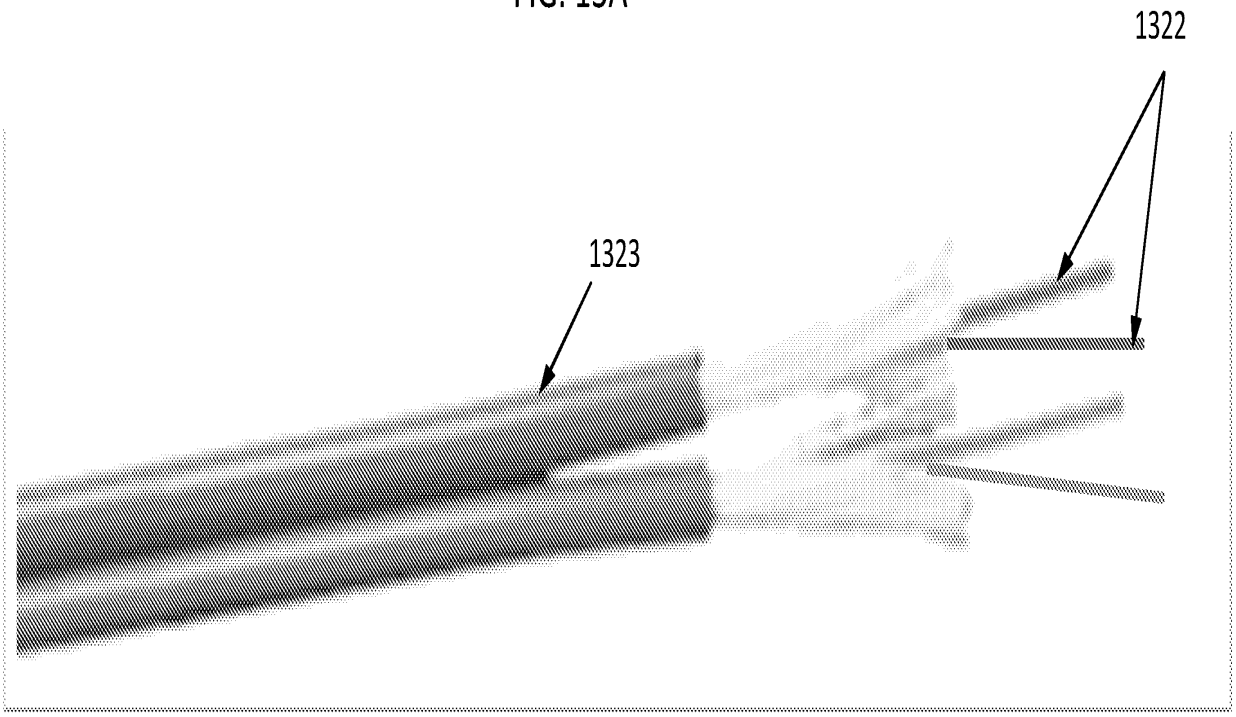


FIG. 13B

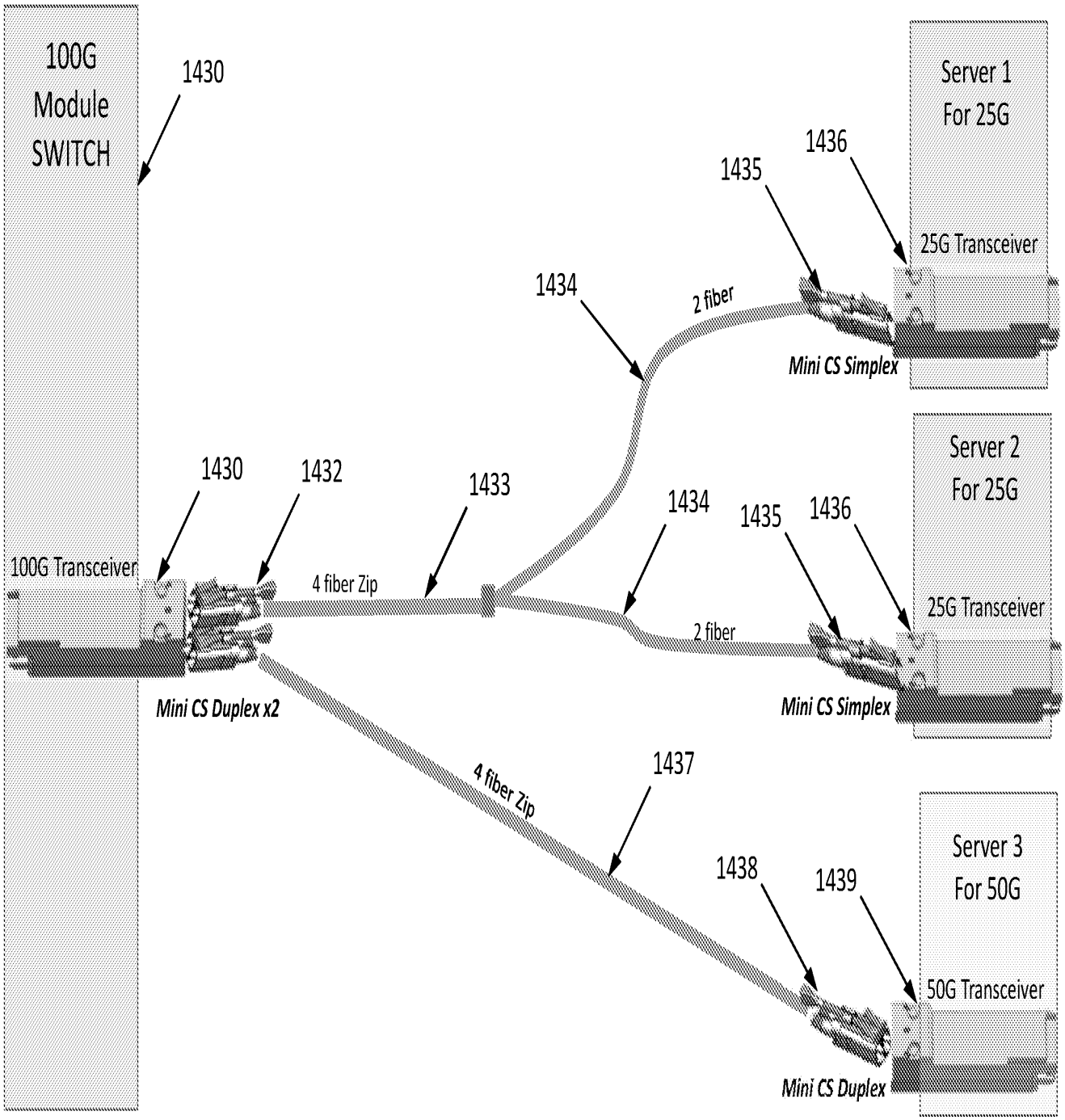

100G
Module
SWITCH
1430
Server 1
For 25G
1436
1435
25G Transceiver
1434
2 fiber
Mini CS Simplex
Server 2
For 25G
1430
1432
1433
1434
1435
1436
100G Transceiver
4 fiber Zip
25G Transceiver
2 fiber
Mini CS Duplex x2
Mini CS Simplex
1437
4 fiber Zip
Server 3
For 50G
1438
1439
50G Transceiver
Mini CS Duplex

FIG. 14

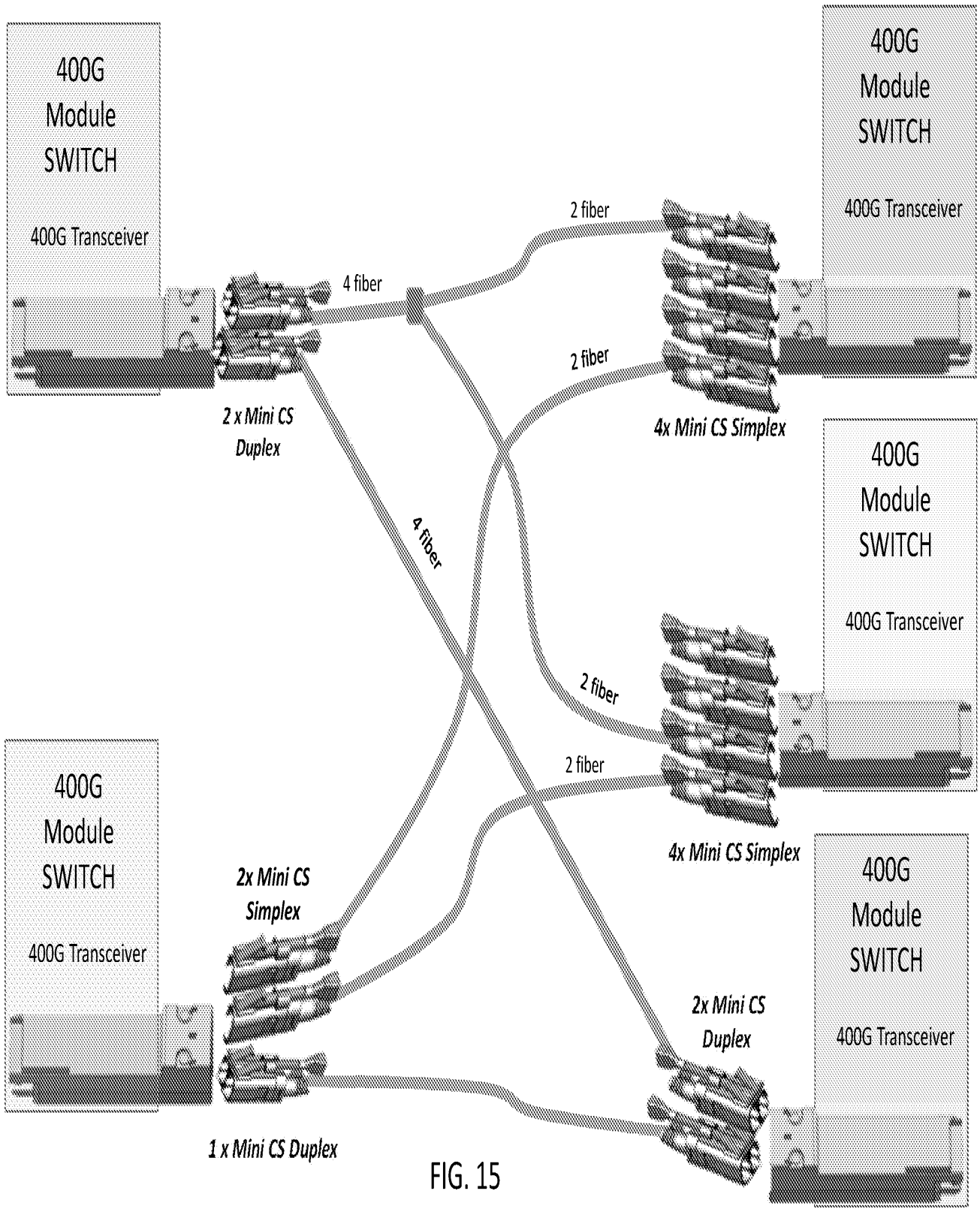

400G
Module
SWITCH
400G Transceiver
400G
Module
SWITCH
400G Transceiver
2 fiber
4 fiber
2 fiber
2 x Mini CS
Duplex
4x Mini CS Simplex
4 fiber
400G
Module
SWITCH
400G Transceiver
2 fiber
2 fiber
4x Mini CS Simplex
400G
Module
SWITCH
400G Transceiver
2x Mini CS
Simplex
2x Mini CS
Duplex
400G
Module
SWITCH
400G Transceiver
1 x Mini CS Duplex

FIG. 15

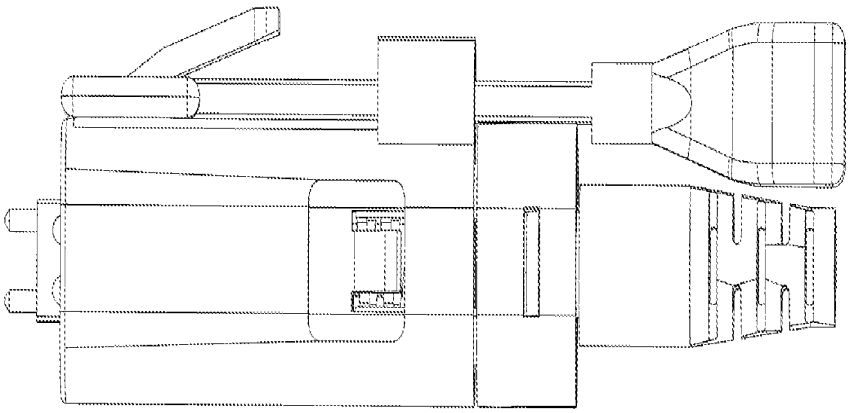


FIG. 16A

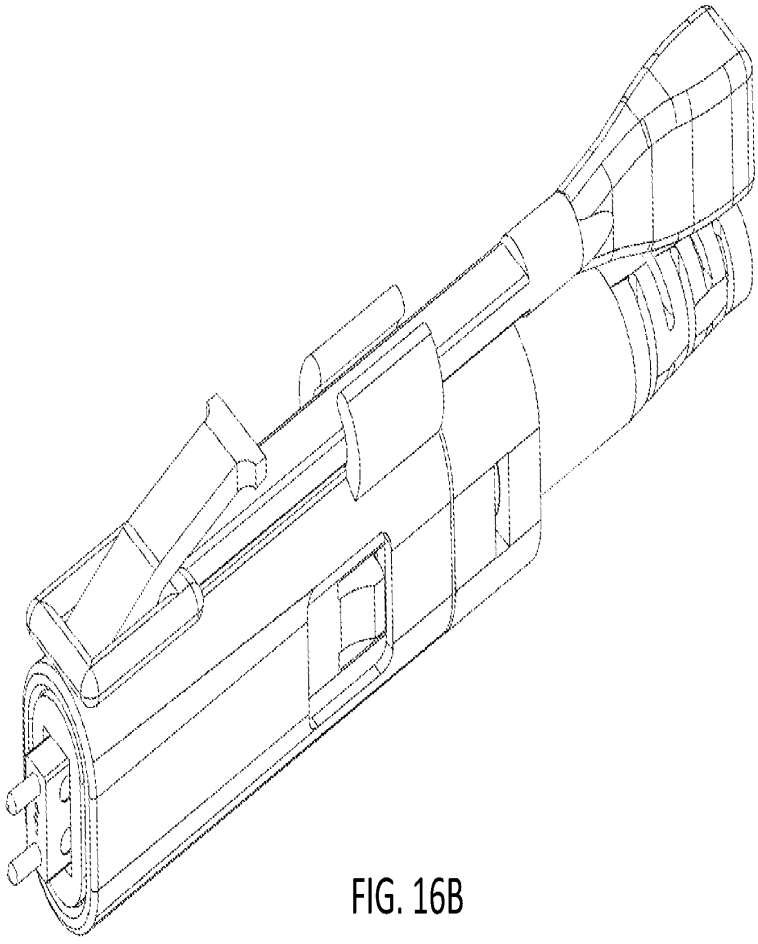


FIG. 16B

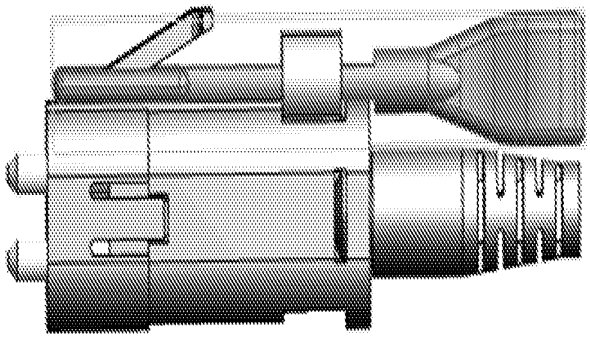


FIG. 17A

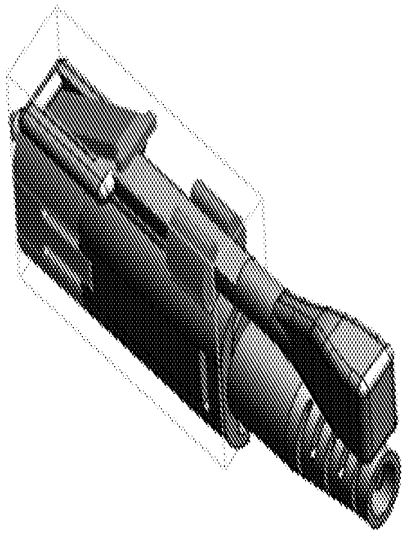


FIG. 17B

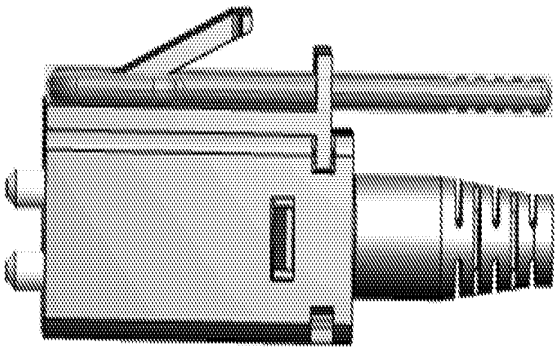


FIG. 17C

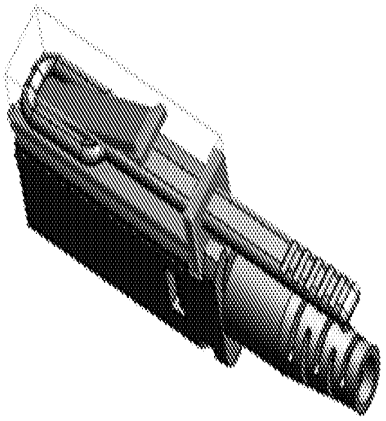


FIG. 17D

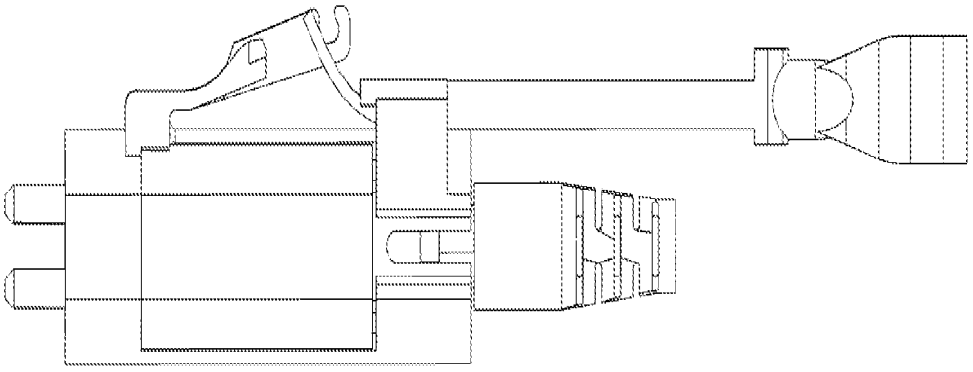


FIG. 18A

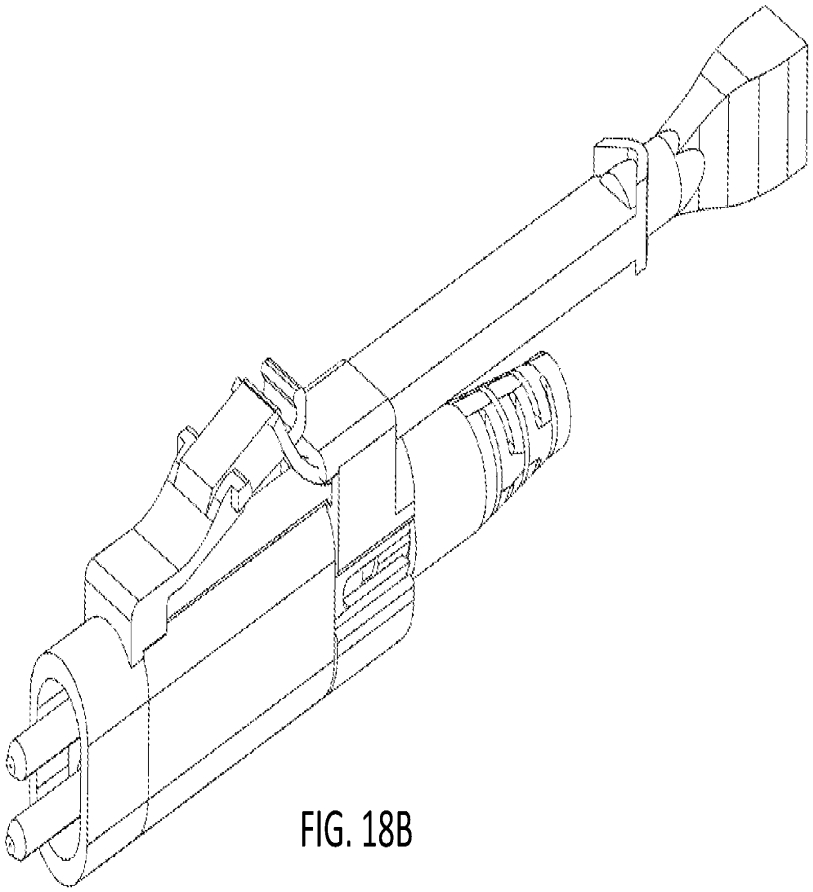


FIG. 18B

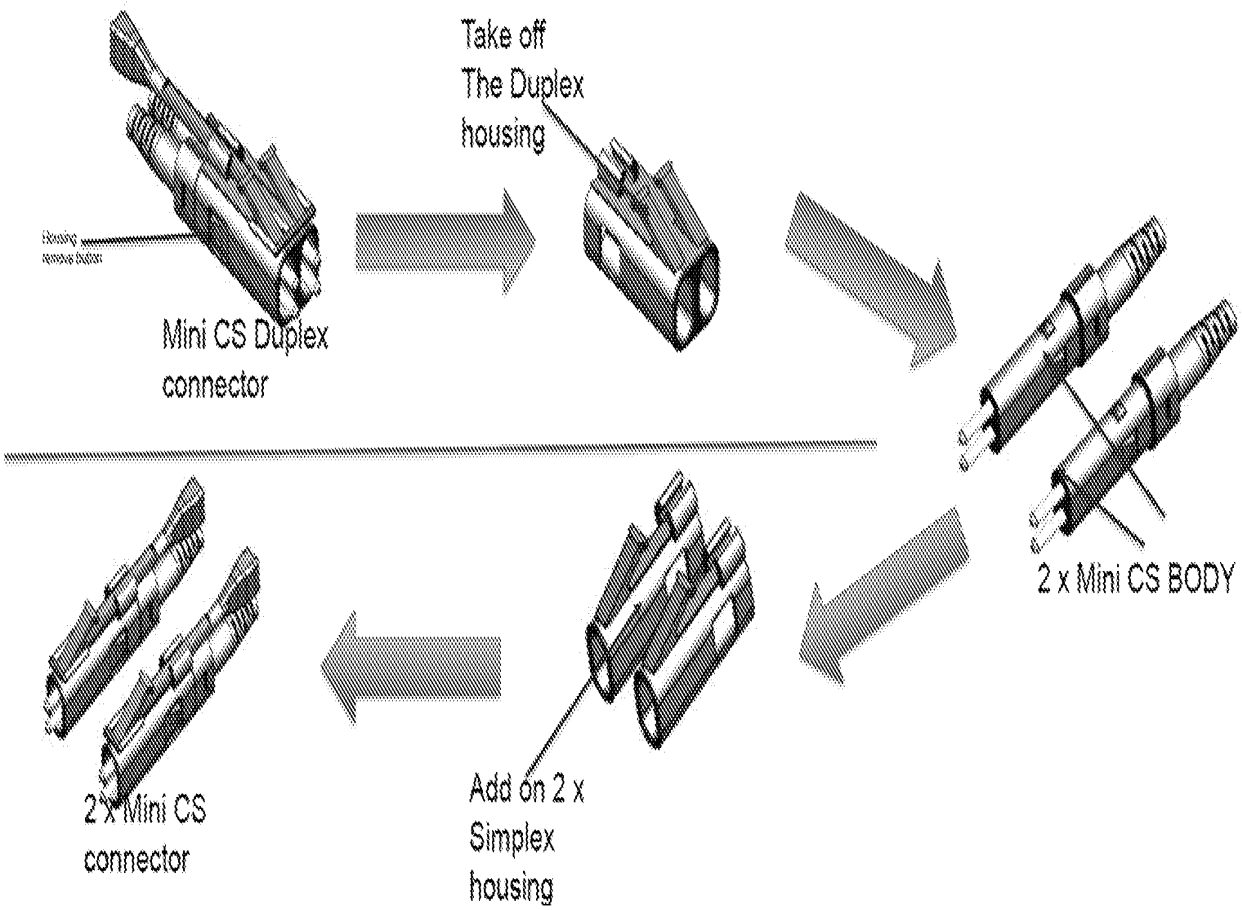

Take off
The Duplex
housing
Mini CS Duplex
connector
2 x Mini CS BODY
2 x Mini CS
connector
Add on 2 x
Simplex
housing

FIG. 19

Electronic Patent Application Fee Transmittal	
Application Number:	
Filing Date:	
Title of Invention:	Grouped Mini CS Fiber Optic Connectors
First Named Inventor/Applicant Name:	Kazuyoshi Takano
Filer:	Alison L. McCarthy
Attorney Docket Number:	133077.05500
Filed as Small Entity	
Filing Fees for Provisional	

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
PROVISIONAL APPLICATION FILING FEE	2005	1	130	130
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**130**

Electronic Acknowledgement Receipt	
EFS ID:	29788931
Application Number:	62532710
International Application Number:	
Confirmation Number:	7780
Title of Invention:	Grouped Mini CS Fiber Optic Connectors
First Named Inventor/Applicant Name:	Kazuyoshi Takano
Customer Number:	136404
Filer:	Alison L. McCarthy/Sharon Calhoun
Filer Authorized By:	Alison L. McCarthy
Attorney Docket Number:	133077.05500
Receipt Date:	14-JUL-2017
Filing Date:	
Time Stamp:	16:37:55
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$130
RAM confirmation Number	071717INTEFSW16385300
Deposit Account	500436
Authorized User	Sharon Calhoun
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	5500-Provisional-ADS-aia0014.pdf	1822871 fe6391cd1e3d2c1ca2d9949a7a3774bca068b7e0	no	8
Warnings:					
Information:					
2	Specification	5500-Provisional-Application.pdf	169084 a0f17efe7bf44dc7b2aca6206102cf651c3909b7	no	16
Warnings:					
Information:					
3	Drawings-only black and white line drawings	5500-Figures.pdf	3253061 4d98b152256b7523a9bb808bd1fc3f0445198af6	no	21
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	29519 bec6dce41ecd2a071602a2b3475f647a1ca5b86d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	5274535		

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New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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