Rev. AO 120 (Rev. 2/99)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Virginia on the following x Patents or Trademarks:

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
1:11cv735 (GBL/IDD)	July 12, 2011	United States District Court, Eastern District of Virginia

PLAINTIFF	DEFENDANT
ADC Telecommunications, Inc.	Opterna AM, Inc.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	7,756,379	July 10, 2010	ADC Telecommunications, Inc.
2	7,894,701	February 22, 2011	ADC Telecommunications, Inc.
3	RE 41,460	July 27, 2010	ADC Telecommunications, Inc.
4	RE 38,311	November 11, 2003	ADC Telecommunications, Inc.
5			

In the above—entitled case, the following patent(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT
Action Voluntarily Dismissed

CLERK	(BY) DEPUTY CLERK	DATE
Fernando Galindo	/s/ Richard Bonke	2/23/12

Copy 1—Upon initiation of action, mail this copy to Commissioner Copy 3—Upon termination of action, mail this copy to Commissioner
Copy 2—Upon filing document adding patent(s), mail this copy to Commissioner Copy 4—Case file copy

AO 120 (Rev. 2/99)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Virginia on the following x Patents or Trademarks:

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
1:11cv735 (GBL/IDD)	July 12, 2011	United States District Court, Eastern District of Virginia

PLAINTIFF	DEFENDANT
ADC Telecommunications, Inc.	Opterna AM, Inc.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	7,756,379	July 10, 2010	ADC Telecommunications, Inc.
2	7,894,701	February 22, 2011	ADC Telecommunications, Inc.
3	RE 41,460	July 27, 2010	ADC Telecommunications, Inc.
4	RE 38,311	November 11, 2003	ADC Telecommunications, Inc.
5			

In the above—entitled case, the following patent(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
Fernando Galindo		

Copy 1—Upon initiation of action, mail this copy to Commissioner Copy 3—Upon termination of action, mail this copy to Commissioner
Copy 2—Upon filing document adding patent(s), mail this copy to Commissioner Copy 4—Case file copy

IPR2025-01119
Belden EX1006

AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Pennsylvania on the following

X Trademarks ☐ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
11-2509	4/11/11	601 Market Street, Philadelphia, PA 19106

PLAINTIFF	DEFENDANT
ADC TELECOMMUNICATIONS, INC. 1187 PARK PLACE SHAKOPEE, MN 55379	OPTERNA AM, INC. 1900 AM DRIVE QUAKERTOWN, PA 18951

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	38,311	11/11/03	ADC
2	41, 460	7/27/10	ADC
3	7,756,379	7/13/11	ADC
4	7,894,701	2/22/11	ADC
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/182,705	07/13/2010	7756379	02316.2584USU2	4252

23552 7590 06/23/2010

MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

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

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

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

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

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

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

Scott C. Kowalczyk, Savage, MN;
Jonathan Walter Coan, Savage, MN;
Jonathan R. Kaml, Shakopee, MN;

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

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

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

23552 7590 04/19/2010

MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

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

Certificate of Mailing or Transmission

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

Jessica R. Molitor (Depositor's name)
(Signature)
June 3, 2010 (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/182,705	07/30/2008	Scott C. Kowalczyk	02316.2584USU2	4252

TITLE OF INVENTION: FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1510	$300	$0	$1810	07/19/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
ULLAH, AKM E	2874	385-135000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

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

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

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

(A) NAME OF ASSIGNEE: ADC Telecommunications, Inc.
(B) RESIDENCE: (CITY and STATE OR COUNTRY): Eden Prairie, Minnesota

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

4a. The following fee(s) are submitted:
☒ Issue Fee
☒ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
☒ Payment by credit card. ~~Form PTO-2038 is attached~~.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date June 3, 2010

Typed or printed name Jarett D. Millar Registration No. 57,679

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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

Electronic Patent Application Fee Transmittal

Application Number:	12182705
Filing Date:	30-Jul-2008
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
Filer:	Jarett Dykes Millar/Jessica Molitor
Attorney Docket Number:	02316.2584USU2

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	1501	1	1510	1510
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1810**

Electronic Acknowledgement Receipt

EFS ID:	7743170
Application Number:	12182705
International Application Number:	
Confirmation Number:	4252
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
Customer Number:	23552
Filer:	Jarett Dykes Millar/Jessica Molitor
Filer Authorized By:	Jarett Dykes Millar
Attorney Docket Number:	02316.2584USU2
Receipt Date:	03-JUN-2010
Filing Date:	30-JUL-2008
Time Stamp:	18:57:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1810
RAM confirmation Number	7464
Deposit Account	132725
Authorized User	MILLAR,JARETT D.

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

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

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	Issue_Fee_Transmittal-Part-B.PDF	106733 8b3e94bb27506dd237433365138477bfa65d531c	no	1
Warnings:					
Information:					
2	Fee Worksheet (PTO-875)	fee-info.pdf	32194 081271d89911117a56805ad549d69bd4adaf8463	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	138927		

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 NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/182,705	07/30/2008	Scott C. Kowalczyk	02316.2584USU2	4252

23552 7590 05/19/2010

MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

EXAMINER	
ULLAH, AKM E	

ART UNIT	PAPER NUMBER
2874	

MAIL DATE	DELIVERY MODE
05/19/2010	PAPER

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

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

SUPPLEMENTAL Notice of Allowability	Application No. 12/182,705	Applicant(s) KOWALCZYK ET AL.	
	Examiner AKM ULLAH	Art Unit 2874	

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

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

1. ☒ This communication is responsive to *4/15/2010*.

2. ☒ The allowed claim(s) is/are *1-3,5,6,8,11-13 and 16-31*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

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

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

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

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

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 4/15/2010
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/AKM ULLAH/
Primary Examiner, Art Unit 2874

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12182705	KOWALCZYK ET AL.
	Examiner	Art Unit
	Akm E Ullah	2874

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

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

CLAIM		DATE								
Final	Original	06/17/2009	11/16/2009	04/14/2010						
1	1	✓	=	=						
2	2	✓	=	=						
3	3	✓	=	=						
-	4	✓	-	-						
4	5	✓	=	=						
5	6	✓	=	=						
-	7	✓	-	-						
6	8	✓	=	=						
-	9	✓	-	-						
-	10	✓	-	-						
7	11	✓	=	=						
8	12	✓	=	=						
9	13	✓	=	=						
-	14	✓	-	-						
-	15	✓	-	-						
10	16	✓	=	=						
11	17	✓	=	=						
12	18		=	=						
13	19		=	=						
14	20		=	=						
15	21		=	=						
16	22		=	=						
17	23		=	=						
18	24		=	=						
19	25		=	=						
20	26		=	=						
21	27			=						
22	28			=						
23	29			=						
24	30			=						
25	31			=						

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12182705	KOWALCZYK ET AL.
	Examiner	**Art Unit**
	Akm E Ullah	2874

ORIGINAL		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
385	135	G 0 2 B 6 / 00 (2006.01)	

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
385	147				

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

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	11	17												
2	2	12	18												
3	3	13	19												
-	4	14	20												
4	5	15	21												
5	6	16	22												
-	7	17	23												
6	8	18	24												
-	9	19	25												
-	10	20	26												
7	11	21	27												
8	12	22	28												
9	13	23	29												
-	14	24	30												
-	15	25	31												
10	16														

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	25	
/Akm E Ullah/ Primary Examiner.Art Unit 2874	05-18-2010	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	17

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 02316.2584USU2	Application Number: 12/182,705
	Applicant: Kowalczyk et al.	
	Filing Date: July 30, 2008	Group Art Unit: 2874

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	5,317,663	05/31/1994	Beard et al.			
	5,497,444	03/05/1996	Wheeler			
	5,717,810	02/10/1998	Wheeler			
	6,591,051	07/08/2003	Solheid et al.			
	2007/0025675	02/01/2007	Kramer			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

23552
PATENT TRADEMARK OFFICE

EXAMINER	/Akm Ullah/	DATE CONSIDERED	05/18/2010

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

23552 7590 04/19/2010

MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

EXAMINER	
ULLAH, AKM E	
ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 04/19/2010

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/182,705	07/30/2008	Scott C. Kowalczyk	02316.2584USU2	4252

TITLE OF INVENTION: FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1510	$300	$0	$1810	07/19/2010

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

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

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

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

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

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

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

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

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

23552 7590 04/19/2010

MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

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

Certificate of Mailing or Transmission

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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/182,705	07/30/2008	Scott C. Kowalczyk	02316.2584USU2	4252

TITLE OF INVENTION: FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1510	$300	$0	$1810	07/19/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
ULLAH, AKM E	2874	385-135000

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

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

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

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

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

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

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

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

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

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

❑ A check is enclosed.

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

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

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

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/182,705	07/30/2008	Scott C. Kowalczyk	02316.2584USU2	4252

23552 7590 04/19/2010

MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

EXAMINER	
ULLAH, AKM E	
ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 04/19/2010

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

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

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

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

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

Notice of Allowability	Application No.	Applicant(s)	
	12/182,705	KOWALCZYK ET AL.	
	Examiner	Art Unit	
	Akm Enayet Ullah	2874	

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

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

1. ☒ This communication is responsive to *3/2/2010*.

2. ☒ The allowed claim(s) is/are *1-3,5,6,8,11-13 and 16-26*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

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

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

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

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

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 3/02/2010
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Akm Enayet Ullah/
Primary Examiner
Art Unit: 2874

Reasons For Allowance

The following is an examiner's statement of reasons for allowance: Claims are allowed since certain key features of the claimed invention are not taught or fairly suggested by prior art. For an example , in claim 1 **a cable spool engaged with the bearing mount such that the cable spool selectively rotates within the housing about an axis, the cable spool having an axial end; and a plurality of adapters a termination module disposed on the axial end of the cable spool so that the termination module plurality of adapters rotates in unison with the cable spool; a cable management spool disposed on the axial end of the cable spool; and a fiber optic cable wrapped about a spooling portion of the cable spool, the fiber optic cable having an end portion including connector zed ends, the end portion being routed from the spooling portion of the cable spool, around the cable management spool, and engaged to first sides of the plurality of adapters**.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Akm Enayet Ullah whose telephone number is (571)272-2361. The examiner can normally be reached on Monday through Thursday from 6:30 to 5p.m.

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

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Akm Enayet Ullah
Primary Examiner
Art Unit 2874

EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	17	(fiber adj optic adj enclosure).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2010/04/14 13:52
L2	0	(fibre adj optic adj enclosure).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2010/04/14 13:53
L3	4203	(housing near "15" bearing adj mount).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2010/04/14 13:53
L4	45	(housing near15 bearing adj mount).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2010/04/14 13:54
L5	0	(cable adj spool near15 housing near15 bearing adj mount).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2010/04/14 13:54
L6	1	(cable adj spool same bearing adj mount).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2010/04/14 13:55
L7	14	(cable adj management adj spool).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2010/04/14 13:55
L8	0	(adapters near15 axial adj end near5 cable adj spool).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2010/04/14 13:56
L9	0	(adapters near15 axial adj end near5 cable adj spool).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2010/04/14 13:57

L10	0	(adapters near15 axial adj end near5 cable adj spool).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2010/04/14 13:58
L11	0	1 and 3 and 4 and 7	US-PGPUB; USPAT; UPAD	OR	OFF	2010/04/14 13:59

4/14/2010 1:59:31 PM
C:\Documents and Settings\AUllah\My Documents\EAST\Workspaces\22222222.wsp

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.U./

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 02316.2584USU2	Application Number: 12/182,705
	Applicant: Kowalczyk et al.	
	Filing Date: July 30, 2008	Group Art Unit: 2874

U.S. PATENT DOCUMENTS						
EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	2008/0315030	12/2008	Hendrickson et al.			
	2005/0258411	11/2005	Zeitler			
	2005/0247136	11/2005	Cross et al.			
	2004/0244430	12/2004	Sheehy et al.			
	2002/0171002	11/2002	Krestsch et al.			
	2002/0164121	11/2002	Brennan et al.			
	2006/0163403	07/2006	Dickson			
	2001/0048044	12/2001	Sugata			
	2008/0037945	02/2008	Gniadek et al.			
	2003/0037480	02/2003	Davis			
	2008/0035778	02/2008	Belden et al.			
	2002/0023814	02/2002	Poutiatine			
	RE 20,995	02/1939	Unknown			
	1,276,825	08/1918	Unknown			
	1,442,999	01/1923	Boardman et al.			
	1,446,410	02/1923	McCormick et al.			
	1,474,580	11/1923	Clark et al.			
	2,502,496	04/1950	Wickman			
	2,521,226	09/1950	Keller			
	3,131,729	05/1964	Rudolf			
	3,657,491	04/1972	Ryder et al.			
	3,667,417	06/1972	Clinkenbeard			
	3,940,086	02/1976	Stoqulet			
	4,053,118	10/1977	Aikins			
	4,081,258	03/1978	Goell et al.			
	4,384,688	05/1983	Smith			

EXAMINER	/Akm Ullah/	DATE CONSIDERED	04/14/2010

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.U./

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 02316.2584USU2	Application Number: 12/182,705
	Applicant: Kowalczyk et al.	
	Filing Date: July 30, 2008	Group Art Unit: 2874

	4,587,801	05/1986	Missout et al.			
	4,653,875	01/1987	Apple			
	4,666,237	05/1987	Mallinson			
	4,767,073	08/1988	Malzacher			
	4,869,437	09/1989	Berz et al.			
	4,883,337	11/1989	Dahlgren			
	4,939,798	07/1990	Last			
	5,016,554	05/1991	Harris et al.			
	5,066,256	11/1991	Ward			
	5,074,863	12/1991	Dines			
	5,185,843	02/1993	Aberson et al.			
	5,265,815	11/1993	Soyka et al.			
	5,280,861	01/1994	Corriveau			
	5,335,874	08/1994	Shrum et al.			
	5,519,275	05/1996	Scott et al.			
	5,544,836	08/1996	Pera			
	5,703,990	12/1997	Robertson et al.			
	5,709,347	01/1998	Hoffmann et al.			
	5,718,397	02/1998	Stevens			
	5,749,148	05/1998	White et al.			
	5,787,219	07/1998	Muellet et al.			
	5,915,640	06/1999	Wagter et al.			
	5,987,203	11/1999	Abel et al.			
	5,992,787	11/1999	Burke			
	6,315,598	11/2001	Elliot et al.			
	6,494,396	12/2002	Sugata			
	6,616,080	09/2003	Edwards el al.			
	6,834,517	12/2004	Sheehy, Jr.			
	6,915,058	07/2005	Pons			

EXAMINER	/Akm Ullah/	DATE CONSIDERED	04/14/2010

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 02316.2584USU2	Application Number: 12/182,705
	Applicant: Kowalczyk et al.	
	Filing Date: July 30, 2008	Group Art Unit: 2874

	6,937,725	08/2005	Liao				
	6,997,410	02/2006	Huang				
	7,000,863	02/2006	Bethea et al.				
	7,011,538	03/2006	Chang				
	7,016,590	03/2006	Tanaka et al.				
	7,017,721	03/2006	Bradford et al.				
	7,220,144	05/2007	Elliot et al.				
	7,364,108	04/2008	Kim et al.				
	7,369,739	05/2008	Kline et al.				
	7,400,814	07/2008	Hendrickson et al.				
	7,522,806	04/2009	Hendrickson et al.				
	7,546,018	06/2009	Hendrickson et al.				
FOREIGN PATENT DOCUMENTS							
	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
	JP 2003114339	04/2003	JP				
	FR 2566997	01/1986	FR				
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)							

23552
PATENT TRADEMARK OFFICE

EXAMINER	/Akm Ullah/	DATE CONSIDERED	04/14/2010

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12182705	KOWALCZYK ET AL.
	Examiner	Art Unit
	Akm E Ullah	2874

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

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

CLAIM		DATE								
Final	Original	06/17/2009	11/16/2009	04/14/2010						
1	1	✓	=	=						
2	2	✓	=	=						
3	3	✓	=	=						
-	4	✓	-	-						
4	5	✓	=	=						
5	6	✓	=	=						
-	7	✓	-	-						
6	8	✓	=	=						
-	9	✓	-	-						
-	10	✓	-	-						
7	11	✓	=	=						
8	12	✓	=	=						
9	13	✓	=	=						
-	14	✓	-	-						
-	15	✓	-	-						
10	16	✓	=	=						
11	17	✓	=	=						
12	18		=	=						
13	19		=	=						
14	20		=	=						
15	21		=	=						
16	22		=	=						
17	23		=	=						
18	24		=	=						
19	25		=	=						
20	26		=	=						

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12182705	KOWALCZYK ET AL.
	Examiner	**Art Unit**
	Akm E Ullah	2874

ORIGINAL		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
385	135	G 0 2 B 6 / 00 (2006.01)	

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
385	147				

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

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	11	17												
2	2	12	18												
3	3	13	19												
-	4	14	20												
4	5	15	21												
5	6	16	22												
-	7	17	23												
6	8	18	24												
-	9	19	25												
-	10	20	26												
7	11														
8	12														
9	13														
-	14														
-	15														
10	16														

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	20	
/Akm E Ullah/ Primary Examiner.Art Unit 2874	04-14-2010	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	17

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12182705	KOWALCZYK ET AL.
	Examiner	Art Unit
	Akm E Ullah	2874

SEARCHED

Class	Subclass	Date	Examiner
385	135-139	6-15-2009	AU
Updated above	135-139	11/16/2009	AU
Updated Above	135-139	4/14/2010	AU

SEARCH NOTES

Search Notes	Date	Examiner
EAST SEARCH HISTORY	6/11/2009	AU
INVENTOR and ASSIGNEE and updated above	11/16/2009	AU
Updated Above	4/14/2010	AU

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner
385	135-139	11/16/2009	AU
385	135-139	4/14/2010	AU

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Kowalczyk et al.	Examiner:	Ullah, Akm E.
Serial No.:	12/182,705	Group Art Unit:	2874
Filed:	07/30/2008	Docket No.:	02316.2584USU2
Customer No.:	23552	Confirmation No.:	4252
Title:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL		

PRELIMINARY AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

Please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims that begins on page 2 of this paper.

Remarks begin on page 8 of this paper.

Amendments to the Claims:

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

Listing of Claims:

1. (Previously Presented) A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing having an interior region;

a bearing mount disposed in the interior region of the housing;

a cable spool engaged with the bearing mount such that the cable spool selectively rotates within the housing about an axis, the cable spool having an axial end;

a plurality of adapters disposed on the axial end of the cable spool so that the plurality of adapters rotates in unison with the cable spool;

a cable management spool disposed on the axial end of the cable spool; and

a fiber optic cable wrapped about a spooling portion of the cable spool, the fiber optic cable having an end portion including connectorized ends, the end portion being routed from the spooling portion of the cable spool, around the cable management spool, and engaged to first sides of the plurality of adapters.

2. (Original) A fiber optic enclosure assembly as claimed in claim 1, wherein a needle bearing is disposed on an outer surface of the bearing mount.

3. (Previously Presented) A fiber optic enclosure assembly as claimed in claim 1, wherein the plurality of adapters is engaged with an adapter slot defined by an adapter plate.

4. (Canceled)

5. (Previously Presented) A fiber optic enclosure assembly as claimed in claim 1, wherein the axial end of the cable spool defines a cable passage.

6. (Previously Presented) A fiber optic enclosure assembly as claimed in claim 1, wherein the axial end of the cable spool and the cable management spool cooperatively define a cable passage.

7. (Canceled)

8. (Previously Presented) A method of paying out a fiber optic cable from a fiber optic enclosure, comprising:

mounting a fiber optic enclosure to a wall, the fiber optic enclosure including a housing defining an interior region, the fiber optic enclosure including a cable spool disposed in the interior region, the cable spool being adapted to rotate within the interior region about an axis of the housing that is perpendicular to the wall; and

rotating the cable spool, which includes a fiber optic cable coiled around a spooling portion of the cable spool, about the axis of the housing of the fiber optic enclosure until a desired length of fiber optic cable is paid out, the cable spool having a plurality of adapters disposed on an axial end of the cable spool and a cable management spool disposed on the axial end.

9. (Canceled)

10. (Canceled)

11. (Previously Presented) A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the plurality of adapters is disposed in an adapter slot defined by an adapter plate mounted to the axial end of the cable spool.

12. (Currently Amended) A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, ~~where~~ wherein the ~~the~~ plurality of adapters are disposed in a plurality of sliding adapter modules.

13. (Previously Presented) A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein connectorized ends of a first end of the fiber optic cable are connected to the plurality of adapters disposed on the cable spool.

14. (Canceled)

15. (Canceled)

16. (Original) A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, further comprising fixing the position of the cable spool with respect to the housing when the desired length of fiber optic cable has been paid out.

17. (Original) A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 16, wherein a pin fixes the position of the cable spool with respect to the housing.

18. (Previously Presented) A fiber optic enclosure assembly as claimed in claim 1, wherein the cable management spool includes a plurality of fingers that extend outwardly from an end of the cable management spool.

19. (Previously Presented) A fiber optic enclosure assembly as claimed in claim 1, wherein the axial end of the cable spool includes an outer guide wall that extends outwardly from the axial end in a direction that is generally perpendicular to the axial end, the outer guide wall being disposed adjacent to the cable management spool.

20. (Previously Presented) A fiber optic enclosure assembly as claimed in claim 1, wherein the bearing mount is disposed on a base of the housing so that the axis about which the cable spool rotates is offset from a center of the base of the housing.

21. (Previously Presented) A fiber optic network comprising:

a fiber optic enclosure including:

a housing having an interior region;

a bearing mount disposed in the interior region of the housing;

a cable spool engaged with the bearing mount such that the cable spool selectively rotates within the housing, the cable spool having an axial end;

a plurality of adapters disposed on the axial end of the cable spool so that the plurality of adapters rotates in unison with the cable spool, each of the plurality of adapters having a first side and an oppositely disposed second side;

a fiber optic cable wrapped around the cable spool, the fiber optic cable including a first end and a second end, the first end having a plurality of connectors engaged to the first sides of the plurality of adapters, the second end having a multi-fiber connector; and

a fiber distribution hub in connected engagement with the multi-fiber connector of the fiber optic cable.

22. (Previously Presented) A fiber optic network as claimed in claim 21, wherein the fiber distribution hub includes one or more optical splitters.

23. (Previously Presented) A fiber optic network as claimed in claim 21, further comprising a feeder cable in connected engagement with the fiber distribution hub.

24. (Previously Presented) A fiber optic network as claimed in claim 21, further comprising a cable management spool disposed on the axial end of the cable spool.

25. (Previously Presented) A fiber optic network as claimed in claim 21, wherein the fiber optic enclosure is mounted to a wall of a facility.

26. (Previously Presented) A fiber optic network as claimed in claim 25, wherein the fiber distribution hub is located on a lower level of the facility.

27. (New) A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing having:

a base portion having a back side and a front side, the back side being adapted for engagement to a wall, the front side defining an opening to an interior region defined by the base portion;

a cover engaged to the base portion, the cover being selectively movable to provide access to the interior region;

a cable spool mounted in the interior region of the housing so that the cable spool can rotate within the housing about an axis, the cable spool having a front flange;

a plurality of fiber optic adapters disposed on a front face of the front flange of the cable spool so that the plurality of fiber optic adapters rotates in unison with the cable spool, each of the fiber optic adapters having a first port and a second port;

a cable management structure disposed on the front face of the front flange of the cable spool, the cable management structure defining a cable routing path, the cable management structure including a structure adapted to provide optical fiber bend radius protection; and

a fiber optic cable wrapped about a spooling portion of the cable spool, the fiber optic cable having a plurality of individual fibers, each of the individual fibers having a connectorized end, the connectorized ends being routed to the first ports of the plurality of adapters.

28. (New) A fiber optic enclosure as claimed in claim 27, wherein the cable management structure is a cable management spool.

29. (New) A fiber optic enclosure as claimed in claim 27, further comprising a fanout disposed on the cable spool.

30. (New) A fiber optic enclosure as claimed in claim 29, wherein the fanout is disposed on the front flange of the cable spool.

31. (New) A fiber optic enclosure as claimed in claim 27, wherein the plurality of fiber optic adapters are disposed in a plurality of sliding adapter modules.

IPR2025-01119
Page 35 of 332
Belden EX1006

REMARKS

Claims 1-3, 5, 6, 8, 11-13 and 16-31 are pending. Claim 12 has been amended. Claims 4, 7, 9, 10, 14 and 15 have been canceled. Claims 27-31 have been added.

Applicant respectfully requests a Notice of Allowance. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at the below-listed telephone number.

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, Minnesota 55402-0903
(612) 332-5300

Date: April 15, 2010

/Jarett D. Millar/
Jarett D. Millar
Reg. No. 57,679

23552
PATENT TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Kowalczyk et al.	Examiner:	Ullah, Akm E.
Serial No.:	12/182,705	Group Art Unit:	2874
Filed:	July 30, 2008	Docket No.:	02316.2584USU2
Customer No.:	23552	Confirmation No.:	4252
Title:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL		

Filed EFS-WEB

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT (37 C.F.R. § 1.97(b))

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

With regard to the above-identified application, the items of information listed on the enclosed Form 1449 are brought to the attention of the Examiner.

This statement should be considered because it is submitted before the mailing of a first Office Action after the filing of a Request for Continued Examination under 37 C.F.R. § 1.114 or a CPA under 37 C.F.R. § 1.53(d). Accordingly, no fee is due for consideration of the items listed on the enclosed Form 1449.

No representation is made that a reference is "prior art" within the meaning of 35 U.S.C. §§ 102 and 103 and Applicants reserve the right, pursuant to 37 C.F.R. § 1.131 or otherwise, to establish that the reference(s) are not "prior art." Moreover, Applicants do not represent that a reference has been thoroughly reviewed or that any relevance of any portion of a reference is intended.

Consideration of the items listed is respectfully requested. Pursuant to the provisions of M.P.E.P. 609, it is requested that the Examiner return a copy of the attached Form 1449, marked as being considered and initialed by the Examiner, to the undersigned with the next official communication.

Please charge any additional fees or credit any overpayment to Deposit Account No. 13-2725.

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, Minnesota 55402-0903
(612) 332-5300

Date: April 15, 2010

/Jarett D. Millar/
Jarett D. Millar
Reg. No. 57,679
JDM:jrm

23552
PATENT TRADEMARK OFFICE

IPR2025-01119
Page 38 of 332 **Belden EX1006**

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 02316.2584USU2	Application Number: 12/182,705
	Applicant: Kowalczyk et al.	
	Filing Date: July 30, 2008	Group Art Unit: 2874

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	5,317,663	05/31/1994	Beard et al.			
	5,497,444	03/05/1996	Wheeler			
	5,717,810	02/10/1998	Wheeler			
	6,591,051	07/08/2003	Solheid et al.			
	2007/0025675	02/01/2007	Kramer			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

23552
PATENT TRADEMARK OFFICE

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Electronic Patent Application Fee Transmittal

Application Number:	12182705
Filing Date:	30-Jul-2008
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
Filer:	Jarett Dykes Millar/Jessica Molitor
Attorney Docket Number:	02316.2584USU2

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Claims in excess of 20	1202	5	52	260
Independent claims in excess of 3	1201	1	220	220
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**480**

Electronic Acknowledgement Receipt

EFS ID:	7424668
Application Number:	12182705
International Application Number:	
Confirmation Number:	4252
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
Customer Number:	23552
Filer:	Jarett Dykes Millar/Jessica Molitor
Filer Authorized By:	Jarett Dykes Millar
Attorney Docket Number:	02316.2584USU2
Receipt Date:	15-APR-2010
Filing Date:	30-JUL-2008
Time Stamp:	17:35:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$480
RAM confirmation Number	3933
Deposit Account	132725
Authorized User	MILLAR,JARETT D.

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

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Preliminary_Amendment_filed_4_15_10.PDF	36222 cd9ef7f12444d410b988c4370f8076055713 87f1	yes	8

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Preliminary Amendment	1	1
	Claims	2	7
	Applicant Arguments/Remarks Made in an Amendment	8	8

Warnings:

Information:

2		Supp_IDS_filed_4_15_10.PDF	52890 5f37e13e83a9ac097454aafa8082272ce32b 8697	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Filed (SB/08)	3	3

Warnings:

Information:

3	Fee Worksheet (PTO-875)	fee-info.pdf	32154 7a8e4dac2b7a31078a499fc53b79f2ff514c2 905	no	2

Warnings:

Information:

Total Files Size (in bytes):	121266

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Kowalczyk et al.	Examiner:	Ullah, Akm E.
Serial No.:	12/182,705	Group Art Unit:	2874
Filed:	July 30, 2008	Docket No.:	02316.2584USU2
Customer No.:	23552	Confirmation No.:	4252
Title:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL		

Filed EFS-WEB

REQUEST FOR CONTINUED EXAMINATION UNDER 37 C.F.R. §1.114

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

Under 37 C.F.R. §1.114, it is respectfully requested that this application be accorded the benefits of Continued Examination.

Payment in the amount of $810.00 is being submitted via credit card to cover the required fee for a large entity.

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, MN 55402-0903
612/332-5300

Date: March 2, 2010

/Jarett D. Millar/
Jarett D. Millar
Reg. No. 57,679
JDM:jrm

23552
PATENT TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Kowalczyk et al.	Examiner:	Ullah, Akm E.
Serial No.:	12/182,705	Group Art Unit:	2874
Filed:	July 30, 2008	Docket No.:	02316.2584USU2
Customer No.:	23552	Confirmation No.:	4252
Title:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL		

Filed EFS-WEB

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT (37 C.F.R. § 1.97(b))

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

With regard to the above-identified application, the items of information listed on the enclosed Form 1449 are brought to the attention of the Examiner.

This statement should be considered because it is submitted before the mailing of a first Office Action after the filing of a Request for Continued Examination under 37 C.F.R. § 1.114 or a CPA under 37 C.F.R. § 1.53(d). Accordingly, no fee is due for consideration of the items listed on the enclosed Form 1449.

No representation is made that a reference is "prior art" within the meaning of 35 U.S.C. §§ 102 and 103 and Applicants reserve the right, pursuant to 37 C.F.R. § 1.131 or otherwise, to establish that the reference(s) are not "prior art." Moreover, Applicants do not represent that a reference has been thoroughly reviewed or that any relevance of any portion of a reference is intended.

Consideration of the items listed is respectfully requested. Pursuant to the provisions of M.P.E.P. 609, it is requested that the Examiner return a copy of the attached Form 1449, marked as being considered and initialed by the Examiner, to the undersigned with the next official communication.

Please charge any additional fees or credit any overpayment to Deposit Account No. 13-2725.

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, Minnesota 55402-0903
(612) 332-5300

Date: March 2, 2010

/Jarett D. Millar/
Jarett D. Millar
Reg. No. 57,679
JDM:jrm

23552
PATENT TRADEMARK OFFICE

IPR2025-01119
Page 47 of 332 **Belden EX1006**

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 02316.2584USU2	Application Number: 12/182,705
	Applicant: Kowalczyk et al.	
	Filing Date: July 30, 2008	Group Art Unit: 2874

U.S. PATENT DOCUMENTS						
EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	2008/0315030	12/2008	Hendrickson et al.			
	2005/0258411	11/2005	Zeitler			
	2005/0247136	11/2005	Cross et al.			
	2004/0244430	12/2004	Sheehy et al.			
	2002/0171002	11/2002	Krestsch et al.			
	2002/0164121	11/2002	Brennan et al.			
	2006/0163403	07/2006	Dickson			
	2001/0048044	12/2001	Sugata			
	2008/0037945	02/2008	Gniadek et al.			
	2003/0037480	02/2003	Davis			
	2008/0035778	02/2008	Belden et al.			
	2002/0023814	02/2002	Poutiatine			
	RE 20,995	02/1939	Unknown			
	1,276,825	08/1918	Unknown			
	1,442,999	01/1923	Boardman et al.			
	1,446,410	02/1923	McCormick et al.			
	1,474,580	11/1923	Clark et al.			
	2,502,496	04/1950	Wickman			
	2,521,226	09/1950	Keller			
	3,131,729	05/1964	Rudolf			
	3,657,491	04/1972	Ryder et al.			
	3,667,417	06/1972	Clinkenbeard			
	3,940,086	02/1976	Stoqulet			
	4,053,118	10/1977	Aikins			
	4,081,258	03/1978	Goell et al.			
	4,384,688	05/1983	Smith			

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 02316.2584USU2	Application Number: 12/182,705
	Applicant: Kowalczyk et al.	
	Filing Date: July 30, 2008	Group Art Unit: 2874

	4,587,801	05/1986	Missout et al.			
	4,653,875	01/1987	Apple			
	4,666,237	05/1987	Mallinson			
	4,767,073	08/1988	Malzacher			
	4,869,437	09/1989	Berz et al.			
	4,883,337	11/1989	Dahlgren			
	4,939,798	07/1990	Last			
	5,016,554	05/1991	Harris et al.			
	5,066,256	11/1991	Ward			
	5,074,863	12/1991	Dines			
	5,185,843	02/1993	Aberson et al.			
	5,265,815	11/1993	Soyka et al.			
	5,280,861	01/1994	Corriveau			
	5,335,874	08/1994	Shrum et al.			
	5,519,275	05/1996	Scott et al.			
	5,544,836	08/1996	Pera			
	5,703,990	12/1997	Robertson et al.			
	5,709,347	01/1998	Hoffmann et al.			
	5,718,397	02/1998	Stevens			
	5,749,148	05/1998	White et al.			
	5,787,219	07/1998	Muellet et al.			
	5,915,640	06/1999	Wagter et al.			
	5,987,203	11/1999	Abel et al.			
	5,992,787	11/1999	Burke			
	6,315,598	11/2001	Elliot et al.			
	6,494,396	12/2002	Sugata			
	6,616,080	09/2003	Edwards el al.			
	6,834,517	12/2004	Sheehy, Jr.			
	6,915,058	07/2005	Pons			

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 02316.2584USU2	Application Number: 12/182,705
	Applicant: Kowalczyk et al.	
	Filing Date: July 30, 2008	Group Art Unit: 2874

	6,937,725	08/2005	Liao				
	6,997,410	02/2006	Huang				
	7,000,863	02/2006	Bethea et al.				
	7,011,538	03/2006	Chang				
	7,016,590	03/2006	Tanaka et al.				
	7,017,721	03/2006	Bradford et al.				
	7,220,144	05/2007	Elliot et al.				
	7,364,108	04/2008	Kim et al.				
	7,369,739	05/2008	Kline et al.				
	7,400,814	07/2008	Hendrickson et al.				
	7,522,806	04/2009	Hendrickson et al.				
	7,546,018	06/2009	Hendrickson et al.				
FOREIGN PATENT DOCUMENTS							
	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
	JP 2003114339	04/2003	JP				
	FR 2566997	01/1986	FR				
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)							

23552
PATENT TRADEMARK OFFICE

EXAMINER	DATE CONSIDERED
EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.	

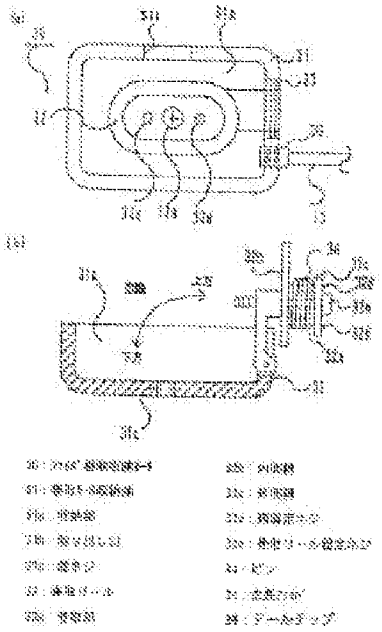
*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

FIBER TAKE-UP STORAGE REEL AND FIBER TAKE-UP STORAGE METHOD

Publication number: JP2003114339 (A)
Publication date: 2003-04-18
Inventor(s): MIMURA SEIICHI +
Applicant(s): MITSUBISHI ELECTRIC CORP +
Classification:
- international: ***G02B6/24; B65H75/14; G02B6/00;*** **G02B6/24; B65H75/04; G02B6/00;** (IPC1-7): G02B6/00; B65H75/14; G02B6/24
- European:
Application number: JP20010308487 20011004
Priority number(s): JP20010308487 20011004

Abstract of **JP 2003114339 (A)**

PROBLEM TO BE SOLVED: To provide a fiber take-up storage reel and a fiber take-up storage method which can improve the operability of winding an excessive-length fiber and evade damage to the excessive-length fiber in the winding operation. SOLUTION: In the fiber take-up storage method of winding the excessive- length fiber 34 from a tail cable 15 around a take-up reel 32 and storing the wound excessive-length fiber 34 in a take-up reel storage part 31, the take-up reel 32 is engaged with the take-up reel storage part 31 by a pin 33 and rotated so that the take-up reel 32 can be stored in and taken out of a storage part 31a; and the excessive-length fiber 34 is wound around the take-up reel 32 outside the storage part 31a and then the take-up reel 32 around which the excessive-length fiber is wound is stored in the storage part 31a of the take-up reel storage part 31.



Data supplied from the ***espacenet*** database — Worldwide

(19)日本国特許庁（ＪＰ）　(12)**公開特許公報**（Ａ）　(11)特許出願公開番号
特開2003－114339
（P2003－114339A）
(43)公開日　平成15年４月18日(2003.4.18)

(51)Int.Cl.[7]	識別記号	ＦＩ		テーマコード(参考)
Ｇ０２Ｂ　6/00	３３６	Ｇ０２Ｂ　6/00	３３６	２Ｈ０３６
Ｂ６５Ｈ　75/14		Ｂ６５Ｈ　75/14	Ｃ	２Ｈ０３８
Ｇ０２Ｂ　6/24		Ｇ０２Ｂ　6/24		３Ｆ０５８

審査請求　未請求　請求項の数12　ＯＬ　（全７頁）

(21)出願番号　特願2001－308487(P2001－308487)

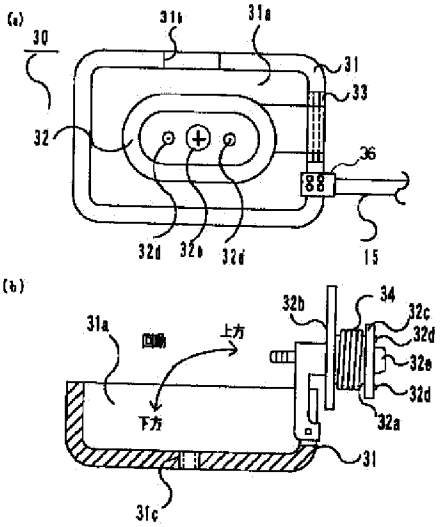
(22)出願日　平成13年10月４日(2001.10.4)

(71)出願人　000006013
三菱電機株式会社
東京都千代田区丸の内二丁目２番３号
(72)発明者　三村　誠一
東京都千代田区丸の内二丁目２番３号　三菱電機株式会社内
(74)代理人　100093562
弁理士　児玉　俊英　（外３名）

Ｆターム(参考)　2H036 RA24
2H038 CA35 CA37
3F058 AA03 AB03 AC14 BB19 CA03
CA05 DA05 DC02

(54)【発明の名称】　ファイバ巻取収納リール及びファイバ巻取収納方法

(57)【要約】
【課題】　余長ファイバの巻取における作業性を向上し、かつ巻取作業における余長ファイバへのダメージを回避することができるファイバ巻取収納リール及び巻取収納方法を提供する。
【解決手段】　テールケーブル１５から出た余長ファイバ３４を巻取リール３２に巻取り、巻取った余長ファイバ３４を巻取リール収納部３１に収納するファイバ巻取収納方法において、巻取リール３２を収納部３１ａに収納することができ、かつ取り出すことができるように巻取リール収納部３１にピン３３で係合させ、回動させて、収納部３１ａの外部で余長ファイバ３４を巻取リール３２に巻取り、余長ファイバ３４を巻取った巻取リール３２を巻取リール収納部３１の収納部３１ａ内部に収納する。



30：ファイバ巻取収納リール
31：巻取リール収納部
31a：収納部
31b：取り出し口
31c：離ネジ
32：巻取リール
32a：巻取部
32b：内側鍔
32c：外側鍔
32d：鍔固定ネジ
32e：巻取リール固定ネジ
33：ピン
34：余長ファイバ
36：テールチップ

【特許請求の範囲】
【請求項１】　圧力筐体の端面板に気密に固定されたフィードスルー及び該フィードスルーに固定されたテールケーブル内に、ファイバガイド構造体に封着された複数本の光ファイバを結束して挿入し、上記テールケーブルから引出した上記複数本の光ファイバの余長ファイバを巻取り、収納するファイバ巻取収納リールにおいて、
該ファイバ巻取収納リールは上記余長ファイバを巻取る巻取リールと該巻取リールを収納する巻取リール収納部とを備え、
上記巻取リールと巻取リール収納部とは係合部で連結され、
上記巻取リールは、上記巻取リール収納部の内部に収納することができ、かつ外部に取り出すことができるように上記巻取リール収納部に上記係合部で係合されていることを特徴とするファイバ巻取収納リール。
【請求項２】　巻取リールは、係合部において回動することによって収納部の内部に収納され、外部へ取り出されることを特徴とする請求項１記載のファイバ巻取収納リール。
【請求項３】　巻取リールは、巻取部と、該巻取部の両側に鍔とを備えることを特徴とする請求項１記載のファイバ巻取収納リール。
【請求項４】　鍔の少なくとも一方が巻取リールに対して着脱できるように設けられていることを特徴とする請求項３記載のファイバ巻取収納リール。
【請求項５】　巻取リールは、巻取部の周面に複数本の光ファイバを束ねた径の余長ファイバを収容できる曲率の溝が螺刻されていることを特徴とする請求項３記載のファイバ巻取収納リール。
【請求項６】　収納した巻取リールを、巻取リール収納部に固定する固定手段を備えたことを特徴とする請求項１記載のファイバ巻取収納リール。
【請求項７】　圧力筐体の端面板に気密に固定されたフィードスルー及び該フィードスルーに固定されたテールケーブル内に、ファイバガイド構造体に封着された複数本の光ファイバを結束して挿入し、上記テールケーブルから引出した上記複数本の光ファイバの余長ファイバを、ファイバ巻取収納部に巻取り収納する収納するファイバ巻取収納方法において、
上記ファイバ巻取収納部を上記余長ファイバを巻き取る巻取リールと該巻取リールを収納する巻取リール収納部とで構成し、
上記巻取リールと巻取リール収納部とを係合部で連結し、
上記巻取リールを、上記巻取リール収納部の内部に収納することができ、かつ外部に取り出すことができるように、上記巻取リール収納部に上記係合部で係合させ、
上記巻取リール収納部の外部で上記余長ファイバを上記巻取リールに巻取り、該余長ファイバを巻取った巻取リールを上記巻取リール収納部の内部に収納することを特徴とするファイバ巻取収納方法。
【請求項８】　巻取リールは、巻取リール収納部の係合部において回動できるように係合し、回動させることによって収納部の内部に収納し、収納部の外部へ取り出すことを特徴とする請求項７記載のファイバ巻取収納方法。
【請求項９】　巻取リールは、巻取部と、該巻取部の両側に鍔とを備えることを特徴とする請求項７記載のファイバ巻取収納方法。
【請求項１０】　鍔の少なくとも一方が巻取リールに対して着脱できるように設けられていることを特徴とする請求項９記載のファイバ巻取収納方法。
【請求項１１】　巻取リールは、巻取部の周面に複数本の光ファイバを束ねた径の余長ファイバを収容できる曲率の溝が螺刻されていることを特徴とする請求項９記載のファイバ巻取収納方法。
【請求項１２】　収納した巻取リールを、巻取リール収納部に固定する固定手段を備えたことを特徴とする請求項７記載のファイバ巻取収納方法。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明は、光海底中継器を構成する圧力筐体の端面板に固定されたテールケーブル内から出た余長ファイバ（光ファイバ）を巻取るファイバ巻取収納リール及びファイバ巻取収納方法に関するものである。
【０００２】
【従来の技術】図４は、一般的な光海底中継器の構成を示す断面図で、例えば特開平８－２０５３７５号公報等に記載されている。
【０００３】図４（ａ）及び（ｂ）において、１は圧力筐体、２はカプラ、３は光ファイバ、４は中継器回路、５は放熱・緩衝体構造であり、圧力筐体１は、シリンダ１１の両端部に端面板１２がはめ込まれ、はめ込み部の全周が溶接され密閉構造とされ、内部に放熱・緩衝体構造５を介して中継器回路４が収納されている。１３は端面板１２を気密に貫通するフィードスルー、１４はフィードスルー１３に挿入されたファイバガイド構造体、１５はカプラ２部とフィードスルー１３との間を接続するテールケーブルであり、テールケーブル１５は給電線を兼ねる耐水圧パイプに複数の光ファイバを収容したものである。
【０００４】図５は、従来の余長ファイバを巻き取る方法を説明するための図であり、（ａ）は、余長ファイバを巻取るファイバ巻取収納リールを示す平面図、（ｂ）は（ａ）の断面図、（ｃ）は光海底中継器の端面板１２をシリンダ１１に嵌合する前の組立完了状態を示す構造図である。図６は、ファイバガイド構造体を示す断面図であり、複数本の光ファイバ３を金属構造物内にガラス

封止部１９で気密に封止し、図４に示したフィードスルー１３に挿入して圧力筐体１を密閉構造にするものである。組立には、図５（ｃ）に示したように、端面板１２にフィードスルー１３、テールケーブル１５を気密に導入し、図６に示したファイバガイド構造体１４の光ファイバ３をテールケーブル１５に挿入し、さらに、フィードスルー１３にファイバガイド構造体１４を挿入し、テールケーブル１５をカーリングした後、テールケーブル１５端に取付けられたテールチップ２１をファイバ巻取収納リール２２に取付け、テールケーブル１５から出た余長ファイバ２３を、図５（ａ）及び（ｂ）に示したファイバ巻取収納リール２２内の溝２２ａ形成によって設けられた巻取部２２ｂにゴム栓２４で押さえつつ巻取り、図５（ｃ）に示したように、ファイバ巻取収納リール２２を端面板１２にボスト６で固定する。

【０００５】さらに、ファイバガイド構造体１４から端面板１２の内側に出た光ファイバ３を中継器回路４に接続すると共に、テールケーブル１５の給電線（耐水圧パイプ）と中継器回路４とを電気的に接続する。

【０００６】その後、圧力筐体１内部への海水の侵入防止及び中継器回路４の防湿のため、端面板１２とシリンダ１１との嵌合部を溶接し、気密に封止する。

【０００７】

【発明が解決しようとする課題】上記従来のファイバ巻取収納リールを用いた余長ファイバの巻取は、ファイバ巻取収納リール内の溝形成によって設けられた巻取部に数本の余長ファイバを１周巻取る毎に、巻取った余長ファイバが溝から突出するのを防止するためにゴム栓をして押えながら巻取るために、非常に作業性が悪いという問題があった。

【０００８】また、ゴム栓で押さえる際に巻取部の側壁面に巻取った余長ファイバが擦れるため、光ファイバへのダメージを誘発しやすいという問題があった。

【０００９】本発明は、上記のような問題を解決し、余長ファイバの巻取における作業性を向上し、かつ巻取作業における余長ファイバへのダメージを回避することができるファイバ巻取収納リール及びファイバ巻取収納方法を提供するものである。

【００１０】

【課題を解決するための手段】本発明に係るファイバ巻取収納リールは、圧力筐体の端面板に気密に固定されたフィードスルー及び該フィードスルーに固定されたテールケーブル内に、ファイバガイド構造体に封着された複数本の光ファイバを結束して挿入し、上記テールケーブルから引出した上記複数本の光ファイバの余長ファイバを巻取り、収納するファイバ巻取収納リールにおいて、該ファイバ巻取収納リールは上記余長ファイバを巻取る巻取リールと該巻取リールを収納する巻取リール収納部とを備え、上記巻取リールと巻取リール収納部とは係合部で連結され、上記巻取リールは、上記巻取リール収納部の内部に収納することができ、かつ外部に取り出すことができるように上記巻取リール収納部に上記係合部で係合されているものである。

【００１１】また、巻取リールは、係合部において回動することによって収納部の内部に収納され、外部へ取り出されるものである。

【００１２】また、巻取リールは、巻取部と、該巻取部の両側に鍔とを備えるものである。

【００１３】また、鍔の少なくとも一方が巻取リールに対して着脱できるように設けられているものである。

【００１４】また、巻取リールは、巻取部の周面に複数本の光ファイバを束ねた径の余長ファイバを収容できる曲率の溝が螺刻されているものである。

【００１５】また、収納した巻取リールを、巻取リール収納部に固定する固定手段を備えたものである。

【００１６】本発明に係るファイバ巻取収納方法は、圧力筐体の端面板に気密に固定されたフィードスルー及び該フィードスルーに固定されたテールケーブル内に、ファイバガイド構造体に封着された複数本の光ファイバを結束して挿入し、上記テールケーブルから引出した上記複数本の光ファイバの余長ファイバを、ファイバ巻取収納部に巻取り収納する収納するファイバ巻取収納方法において、上記ファイバ巻取収納部を上記余長ファイバを巻き取る巻取リールと該巻取リールを収納する巻取リール収納部とで構成し、上記巻取リールと巻取リール収納部とを係合部で連結し、上記巻取リールを、上記巻取リール収納部の内部に収納することができ、かつ外部に取り出すことができるように、上記巻取リール収納部に上記係合部で係合させ、上記巻取リール収納部の外部で上記余長ファイバを上記巻取リールに巻取り、該余長ファイバを巻取った巻取リールを上記巻取リール収納部の内部に収納するものである。

【００１７】また、巻取リールは、巻取リール収納部の係合部において回動できるように係合し、回動させることによって収納部の内部に収納し、収納部の外部へ取り出すものである。

【００１８】また、巻取リールは、巻取部と、該巻取部の両側に鍔とを備えるものである。

【００１９】また、鍔の少なくとも一方が巻取リールに対して着脱できるように設けられているものである。

【００２０】また、巻取リールは、巻取部の周面に複数本の光ファイバを束ねた径の余長ファイバを収容できる曲率の溝が螺刻されているものである。

【００２１】また、収納した巻取リールを、巻取リール収納部に固定する固定手段を備えたものである。

【００２２】

【発明の実施の形態】以下に、本発明の実施の形態を図に基づいて説明する。

実施の形態１．図１は、本発明に係るファイバ巻取収納リールの実施の形態１を示す平面図（ａ）及び部分断面

図（ｂ）である。同図において、３０はファイバ巻取収納リール、３１は巻取リール収納部であり、巻取リール収納部３１は容器の形状をした収納部３１ａを有しており、収納部３１ａ壁の一部に余長ファイバ３４の先端を取り出す取り出し口３１ｂが設けられ、収納部３１ａ底部には雌ネジ３１ｃが設けられ、収納部３１ａ壁の他部を切り欠いて、この切り欠き部にピン３３が固定されている。３６はテールケーブル端部に設けられたテールチップであり、テールケーブル１５を固定ネジ３６ａで巻取リール収納部３１に固定するためのものである。

【００２３】３２は巻取リールであり、巻取リール３２は、巻取リール収納部３１に固定されたピン３３に、ピン３３との係合部で回動できるように係合されており、下方に回動することによって巻取リール収納部３１の収納部３１ａ内に収納され、上方に回動することによって起立して収納部３１ａ外部へ取り出される。

【００２４】余長ファイバ３４を巻取る際、巻取リール３２を起立させ、巻取の障害となる巻取リール収納部３１の側壁から回避させることによって、巻取リール３２の巻取部３２ａの周囲に障害物がない状態で連続して余長ファイバ３４を巻取ることができるので、巻取作業を行うときの作業性が向上する。また、巻取後は下方に回動して巻取リール収納部３１に収納し、ファイバ巻取収納リール３０の占有体積を小さくすることができる。

【００２５】また、巻取リール３２の巻取部３２ａの両側に内側鍔３２ｂと外側鍔３２ｃを設けることによって、内側鍔３２ｂと外側鍔３２ｃとの間に余長ファイバ３４が巻取られて巻取部３２ａの外側に突出しないようにすることができる。

【００２６】また、巻取リール３２に設けられた外側鍔３２ｃを鍔固定ネジ３２ｄで固定し、鍔固定ネジ３２ｄによって外側鍔３２ｃを取り外すことができるようにすることにより、工場出荷後に客先の海底ケーブルに余長ファイバ３４を接続する際に、巻取リール３２から余長ファイバ３４を取り出す作業が容易に行える。この場合、内側鍔３２ｂを取り外すようにしてもよく、内側鍔３２ｂ及び外側鍔３２ｃ両方を取り外すようにしてもよい。

【００２７】また、外側鍔３２ｃ側から内側鍔３２ｂ側へ貫通する巻取リール固定ネジ３２ｅを設け、巻取リール３２を巻取リール収納部３１に収納したとき、巻取リール収納部３１の収納部３１ａ底部に設けた雌ネジ３１ｃに固定ネジ３２ｅを螺合させることによって、巻取リール収納部３１に巻取リール３２を固定することができ、搬送等において巻取リール３２を収納部３１ａに安定した状態に保つことができる。

【００２８】巻取リール収納部３１に巻取リール３２を固定する固定手段は、バネ性を有するクリップ等種々の手段を適用することもできる。

【００２９】巻取リール３２に余長ファイバ３４を巻取り、巻取リール収納部３１に巻取リール３２を固定した後、余長分は取り出し口３１ｂから取り出す。図５に示した従来の技術と同様、ファイバ巻取収納リール３０を端面板１２にボスト６で固定し、ファイバガイド構造体１４から圧力筐体１の内側に出た光ファイバ３を中継器回路４に接続すると共に、テールケーブル１５の給電線（耐水圧パイプ）と中継器回路４とを電気的に接続し、さらに、圧力筐体１内部への海水の侵入防止及び中継器回路４の防湿のため、端面板１２とシリンダ１１との嵌合部を溶接し、気密に封止する。

【００３０】実施の形態２．図２は、本発明に係るファイバ巻取収納リールの実施の形態２を示す断面図であり、同図において、実施の形態１と同一符号は同一部分または相当部分を示している。

【００３１】本実施の形態は、巻取リール収納部３１の収納部３１ａ底部に設けた雌ネジ３１ｂに螺合する雄ネジ３５の先端を巻取リール３２が回転しないように係合させ、雄ネジ３４を回転することによって巻取リール３２を上下させるものである。

【００３２】本実施の形態によれば、雄ネジ３５を回転し、巻取リール３２を収納部３１ａの外部に押し上げることによって、巻取の障害となる巻取リール収納部３１の側壁から回避させ、巻取リール３２の巻取部３２ａの周囲に障害物がない状態で連続して余長ファイバ３４を巻取ることができるので、巻取作業を行うときの作業性が向上する。また、巻取後は雄ネジ３５を逆転させて巻取リール３２を巻取リール収納部３１の収納部３１ａに収納するとともに、巻取リール３２を巻取リール収納部３１に固定することができる。

【００３３】実施の形態３．図３は、本発明に係るファイバ巻取収納リールの実施の形態３を示す側面図であり、巻取リール３２を拡大して示している。同図において、実施の形態１と同一符号は同一部分または相当部分を示している。

【００３４】本実施の形態においては、巻取リール３２の巻取部３２ａ周面に、所定の曲率を有する溝３２ｆが、外側鍔３２ｃから内側鍔３２ｂに亘って螺刻されている。

【００３５】溝３２ｆの曲率φＤは、海底中継器の機種によって異なるが、束ねて巻く光ファイバの束（余長ファイバ３４）の径φｄに対して、φＤ＞φｄとなるように形成する。

【００３６】本実施の形態においては、余長ファイバ３４は、溝３２ｆ内に沿って巻取られ、巻取部３２ａ周面に整列（平準化）した状態で巻取られるので、余長ファイバ３４の特定の箇所に過度な曲げ応力が作用しないようにして、光ファイバの損傷による品質の劣化、あるいは光伝搬特性の劣化を抑制することができるとともに、巻取作業の作業性が向上する。

【００３７】

【発明の効果】本発明に係るファイバ巻取収納リールによれば、圧力筐体の端面板に気密に固定されたフィードスルー及び該フィードスルーに固定されたテールケーブル内に、ファイバガイド構造体に封着された複数本の光ファイバを結束して挿入し、上記テールケーブルから引出した上記複数本の光ファイバの余長ファイバを巻取り、収納するファイバ巻取収納リールにおいて、該ファイバ巻取収納リールは上記余長ファイバを巻取る巻取リールと該巻取リールを収納する巻取リール収納部とを備え、上記巻取リールと巻取リール収納部とは係合部で連結され、上記巻取リールは、上記巻取リール収納部の内部に収納することができ、かつ外部に取り出すことができるように上記巻取リール収納部に上記係合部で係合されているものであるので、巻取作業を行うときの作業性が向上するとともに、余長ファイバ（光ファイバ）に擦傷を生じさせることもない。また、巻取後は巻取リール収納部に収納し、ファイバ巻取収納リールの占有体積を小さくすることができる。

【００３８】また、巻取リールは、係合部において回動することによって収納部の内部に収納され、外部へ取り出されるものであるので、収納部への巻取リールの収納及び取り出しが簡単にできる。

【００３９】また、巻取リールは、巻取部と、該巻取部の両側に鍔とを備えるものであるので、余長ファイバが巻取リールからはみ出すことなく、安定に巻取ることができる。

【００４０】また、鍔の少なくとも一方が巻取リールに対して着脱できるように設けられているものであるので、海底ケーブルに余長ファイバを接続する際に、巻取リールから簡単に取り出すことができる。

【００４１】また、巻取リールは、巻取部の周面に複数本の光ファイバを束ねた径の余長ファイバを収容できる曲率の溝が螺刻されているものであり、余長ファイバを溝に沿って巻き取り、整列させることができるので、余長ファイバの特定の箇所に過度な曲げ応力が作用しないようにして、光ファイバの損傷による品質の劣化、あるいは光伝搬特性の劣化を抑制することができるとともに、巻取作業の作業性が向上する。

【００４２】また、収納した巻取リールを、巻取リール収納部に固定する固定手段を備えたものであるので、巻取リールを収納部に安定した状態に保つことができる。

【００４３】本発明に係るファイバ巻取収納方法によれば、圧力筐体の端面板に気密に固定されたフィードスルー及び該フィードスルーに固定されたテールケーブル内に、ファイバガイド構造体に封着された複数本の光ファイバを結束して挿入し、上記テールケーブルから引出した上記複数本の光ファイバの余長ファイバを、ファイバ巻取収納部に巻取り収納する収納するファイバ巻取収納方法において、上記ファイバ巻取収納部を上記余長ファイバを巻き取る巻取リールと該巻取リールを収納する巻取リール収納部とで構成し、上記巻取リールと巻取リール収納部とを係合部で連結し、上記巻取リールを、上記巻取リール収納部の内部に収納することができ、かつ外部に取り出すことができるように、上記巻取リール収納部に上記係合部で係合させ、上記巻取リール収納部の外部で上記余長ファイバを上記巻取リールに巻取り、該余長ファイバを巻取った巻取リールを上記巻取リール収納部の内部に収納するものであるので、巻取作業を行うときの作業性が向上するとともに、余長ファイバ（光ファイバ）に擦傷を生じさせることもない。また、巻取後は巻取リール収納部に収納し、ファイバ巻取収納リールの占有体積を小さくすることができる。

【００４４】また、巻取リールは、巻取リール収納部の係合部において回動できるように係合し、回動させることによって収納部の内部に収納し、収納部の外部へ取り出すものであるので、収納部への巻取リールの収納及び取り出しが簡単にできる。

【００４５】また、巻取リールは、巻取部と、該巻取部の両側に鍔とを備えるものであるので、余長ファイバが巻取リールからはみ出すことなく、安定に巻取ることができる。

【００４６】また、鍔の少なくとも一方が巻取リールに対して着脱できるように設けられているものであるので、海底ケーブルに余長ファイバを接続する際に、巻取リールから簡単に取り出すことができる。

【００４７】また、巻取リールは、巻取部の周面に複数本の光ファイバを束ねた径の余長ファイバを収容できる曲率の溝が螺刻されているものであり、余長ファイバを溝に沿って巻き取り、整列させることができるので、余長ファイバの特定の箇所に過度な曲げ応力が作用しないようにして、光ファイバの損傷による品質の劣化、あるいは光伝搬特性の劣化を抑制することができるとともに、巻取作業の作業性が向上する。

【００４８】また、収納した巻取リールを、巻取リール収納部に固定する固定手段を備えたものであるので、巻取リールを収納部に安定した状態に保つことができる。

【図面の簡単な説明】

【図１】　本発明に係るファイバ巻取収納リールの実施の形態１を示す平面図（ａ）及び部分断面図（ｂ）である。

【図２】　本発明に係るファイバ巻取収納リールの実施の形態２を示す断面図である。

【図３】　本発明に係るファイバ巻取収納リールの実施の形態３を示す側面図である。

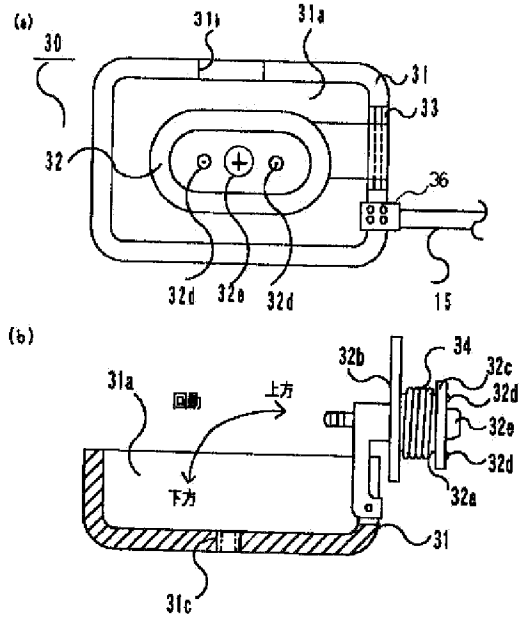
【図４】　海底中継器の一般的な構成を示す断面図である。

【図５】　従来の余長ファイバを巻き取る方法を説明するための図である。

【図６】　ファイバガイド構造体の構成を示す断面図である。

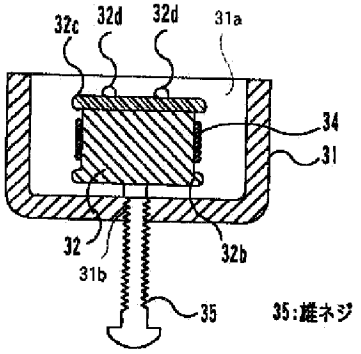
【符号の説明】
３０　ファイバ巻取収納リール、３１　巻取リール収納部、３１ａ　収納部、３１ｂ　取り出し口、３１ｃ　雌ネジ、３２　巻取リール、３２ａ　巻取部、３２ｂ　内側鍔、３２ｃ　外側鍔、３２ｄ　鍔固定ネジ、３２ｅ　巻取リール固定ネジ、３２ｆ　溝、３３　ピン、３４　余長ファイバ、３５　雄ネジ。

【図１】

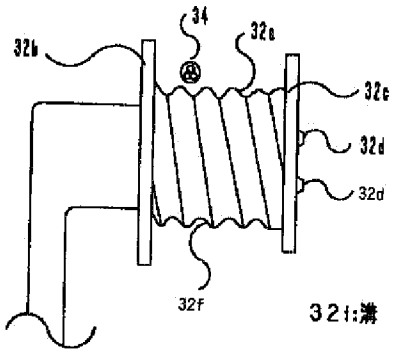


30：ファイバ巻取収納リール
31：巻取リール収納部
31a：収納部
31b：取り出し口
31c：雌ネジ
32：巻取リール
32a：巻取部
32b：内側鍔
32c：外側鍔
32d：鍔固定ネジ
32e：巻取リール固定ネジ
33：ピン
34：余長ファイバ
36：テールチップ

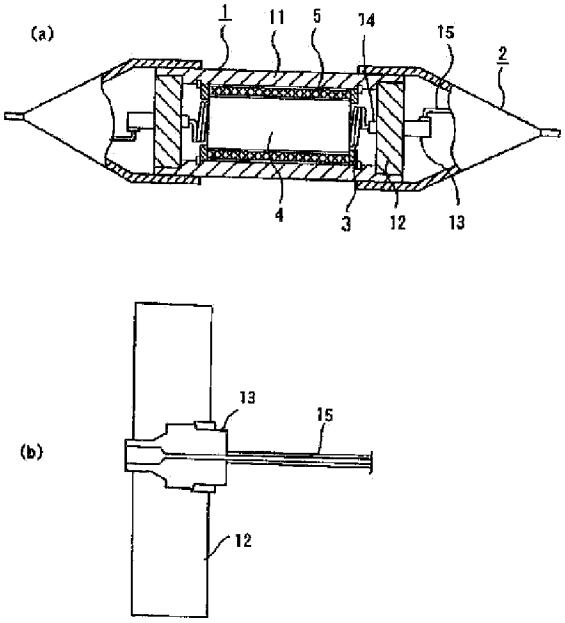
【図２】



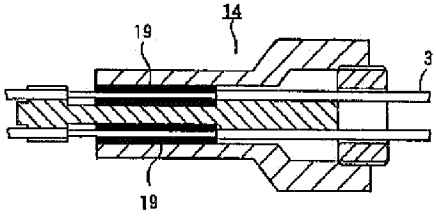
【図３】



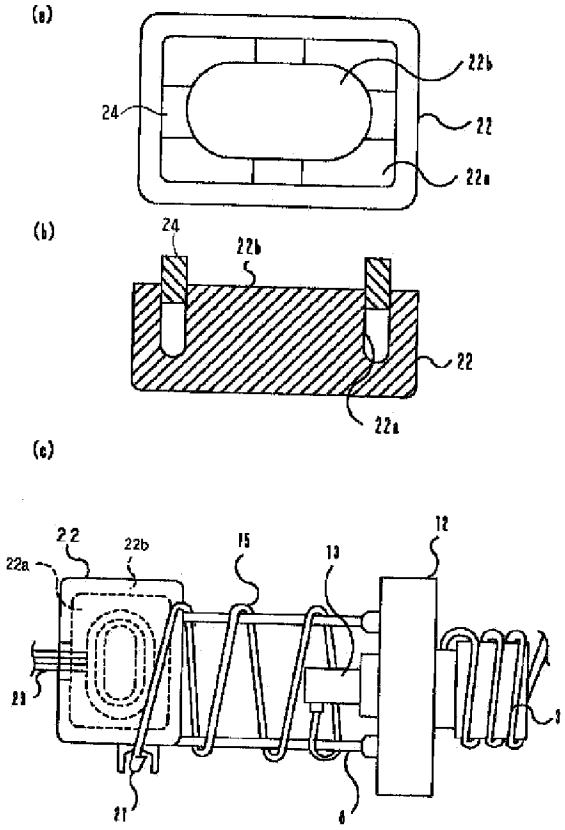
【図４】



【図６】



【図5】



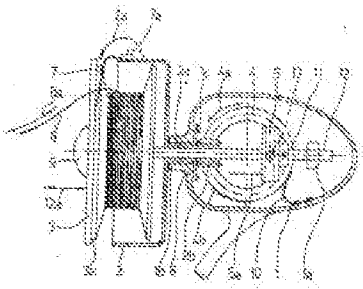
Fishing line reel with external spool

Publication number: FR2566997 (A1)
Publication date: 1986-01-10
Inventor(s):
Applicant(s): REDEN KARL [IT] +
Classification:
- international: ***A01K89/01;*** **A01K89/00;** (IPC1-7): A01K89/01
- European: A01K89/01
Application number: FR19850009772 19850627
Priority number(s): IT19840004841 19840703

Also published as:
SE8503283 (L)
IT1180275 (B)
DE3523077 (A1)

Abstract of **FR 2566997 (A1)**

The fishing line reel with an external spool and rotary casing (2) has a guide hook (7) fitted to the edge of the casing to wind the line onto the spool when the casing is rotated. The hook is attached to the casing with no articulated joints or springs. The line is released by turning the reel in the opposite direction to winding on, so that the line is behind the hook on the casing.



Data supplied from the ***espacenet*** database — Worldwide

(19) RÉPUBLIQUE FRANÇAISE

INSTITUT NATIONAL
DE LA PROPRIÉTÉ INDUSTRIELLE

PARIS

(11) N° de publication : **2 566 997**
(à n'utiliser que pour les commandes de reproduction)

(21) N° d'enregistrement national : **85 09772**

(51) Int Cl⁴ : A 01 K 89/01.

(12) DEMANDE DE BREVET D'INVENTION A1

(22) **Date de dépôt :** 27 juin 1985.

(30) **Priorité :** IT, 3 juillet 1984, n° 4841/A 84.

(43) **Date de la mise à disposition du public de la demande :** BOPI « Brevets » n° 2 du 10 janvier 1986.

(60) **Références à d'autres documents nationaux apparentés :**

(71) **Demandeur(s) :** *REDEN Karl.* — IT.

(72) **Inventeur(s) :** Karl Reden.

(73) **Titulaire(s) :**

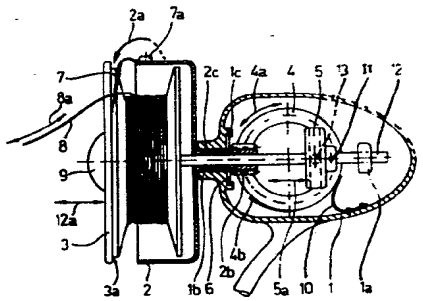
(74) **Mandataire(s) :** Cabinet Gouvernal.

(54) Moulinet de pêche avec bobine placée à l'extérieur sans étrier de retenue du fil.

(57) L'invention est relative à un moulinet de pêche avec bobine 2 placée à l'extérieur.

Le moulinet présente, à la place de l'étrier de retenue du fil 8 de la ligne, un crochet entraîneur 7, 7a qui s'engage, dans la position de rappel maximal 12a de la bobine 3, dans une rainure en épaulement ou dans une gorge ronde, si bien qu'il peut s'accrocher au fil 8 de la ligne pour enrouler cette dernière sur la bobine.

En correspondance avec la position d'extraction maximale de la bobine 3, est prévue, sur la roue dentée 4 qu'entraîne dans les deux sens une manivelle, une saillie 4b qui agit comme une butée lors du mouvement en arrière de la manivelle, dès qu'elle porte sur le cliquet d'arrêt 10 élastique.



FR 2 566 997 - A1

IPR2025-01119
Page 60 of 332
Belden EX1006

La présente invention est relative à un moulinet de pêche avec bobine externe sans pick-up.

On connaît des moulinets de pêche, sur lesquels l'enroulement du fil de ligne est réalisé au moyen d'étriers de retenue du fil (pick-up), ces derniers étant montés sur l'enveloppe rotative de bobine et provoquant un enroulement uniforme du fil par un déplacement simultané de la bobine dans le sens axial.

Le déroulement du fil de ligne hors du lancer, en revanche, a lieu lorsque l'étrier de retenue du fil de ligne est désencliqueté (par action manuelle et/ou automatique), directement à partir de la bobine sans rotation. Afin de faire fonctionner, après le lancer, le frein pour le déroulement du fil de ligne, l'étrier de retenue du fil de ligne est à nouveau encliqueté, si bien que, par suite d'efforts et de tractions sur le fil de ligne, la bobine tourne à fond sur son tourillon, lorsque la force de freinage réglable du frein prévu entre la bobine et le tourillon est éventuellement dépassée.

Sur les moulinets de pêche de ce genre, l'étrier de retenue du fil de ligne est monté sur des ressorts de manière pivotante sur l'enveloppe rotative de bobine, de telle sorte qu'il peut basculer dans les deux positions extrêmes ; fréquemment, des déformations, des efforts trop importants, l'action du sable ou de l'eau, ou encore l'usure sur ces parties, provoquent des défaillances de fonctionnement.

La présente invention se fixe la tâche de créer, à la place de l'étrier de retenue du fil de ligne, un mécanisme dont la fabrication soit simple, le maniement fiable et durable et la composition exempte de ressorts ou de parties montées mobiles.

Suivant l'invention, ce problème est résolu par le fait que sur l'enveloppe rotative de la bobine est prévu un crochet entraîneur dont l'extrémité libre s'étend, lorsque la bobine est rentrée, dans une rainure ou une gorge creuse qui est prévue sur le bord intérieur de la bobine, si bien qu'il accroche le fil en s'engageant derrière lui. Ceci est obtenu par le fait que la rainure est pratiquée sur le bord de la bobine à peu près tangentiellement à l'extrémité libre

du crochet entraîneur rotatif. Suivant un prolongement de la réalisation de l'idée de l'invention, le crochet entraîneur peut être échangeable et positionnable, ainsi qu'être pourvu d'un galet de roulement dans la zone de la boucle.

Pour obtenir à la main la position requise pour le libre déroulement du fil de ligne (lancer) lors du décrochement de celui-ci, il suffit, suivant l'invention, de manoeuvrer la manivelle dans le sens contraire (déroulement), ce qui fait qu'à la position d'extraction maximale de la bobine, un cliquet d'arrêt élastique agissant sur une saillie, prévue à la périphérie de la roue dentée de manivelle, assure l'arrêt.

Le fonctionnement du frein et du mécanisme d'arrêt pour le déroulement du fil de ligne demeure conservé avec le moulinet de pêche suivant l'invention, le rapport de démultiplication de la commande par manivelle est avantageusement non-décimal (1 : 3 ; 1 : 4), afin de garantir en toutes circonstances l'arrêt au moyen du cliquet d'arrêt en position d'extraction toujours maximale de la bobine.

D'autres caractéristiques et avantages de l'invention ressortiront de la description qui va suivre en regard du dessin annexé qui représente, schématiquement et simplement à titre d'exemple non limitatif, un mode de réalisation d'un moulinet de pêche.

Sur ce dessin :

La figure 1 est une vue en coupe longitudinale d'un moulinet de pêche suivant l'invention, avec crochet entraîneur, bobine rainurée et mécanisme d'arrêt pour la roue dentée mue par manivelle.

La figure 2 est une vue du crochet entraîneur sur l'enveloppe rotative de la bobine.

La figure 3 est une vue d'un crochet entraîneur venu de moulage en une seule pièce avec l'enveloppe de bobine.

La figure 4 est une vue de la position du fil de ligne non-accroché qui passe par dessus le bord de bobine à gorge ronde.

La figure 5 est une vue illustrant la position du fil de ligne non-accroché qui passe par dessus le bord de bobine pourvu d'une rainure formant épaulement.

Dans le boîtier 1 est montée la couronne 4 de différentiel entraînée au moyen d'une manivelle dans le sens de la flèche 4a. La roue-couronne 4 engrène avec le pignon 2b qui est relié, par l'intermédiaire de la douille 2c, à l'enveloppe 2 pouvant tourner dans le sens de la flèche 2a et abritant la bobine 3, dont l'axe de rotation forme un angle de 90° par rapport à celui de la manivelle. La douille 2c est montée dans le boîtier 1-1b et est freinée dans le sens axial par une plaquette-frein 6 qui est engagée dans des guides 1c venus de moulage avec le boîtier.

Le perçage de la douille 2c, qui est coaxial au montage 1a dans le boîtier, est traversé par le tourillon 12 à l'extrémité libre duquel est disposée la bobine, y compris le frein réglable. Un téton 13 excentrique, prévu sur la roue dentée 4 et agissant sur l'élément coulissant 5 retenu fermement au tourillon 12 au moyen de la cheville 11, imprime audit tourillon 12 un mouvement axial de va-et-vient selon la double flèche 5a pendant le mouvement de rotation de la manivelle dans le sens 4a correspondant. Ce mouvement axial du tourillon selon la double flèche 5a provoque le mouvement, indiqué par la double flèche 12a, d'extraction et de rentrée de la bobine 3. Pendant la rotation dans le sens de la flèche 2a de l'enveloppe 2 de bobine accompagnée du crochet entraîneur 7, 7b, qui peut venir de moulage avec elle ou être rapporté sur celle-ci, ledit crochet attaque avec l'extrémité libre derrière le fil 8 en glissant le long du fond d'une rainure 3a formant épaulement ou d'une gorge ronde 3b prévue sur le bord de la bobine. Lors de la poursuite du mouvement de rotation dans le même sens, le fil de la ligne 8 est enroulé sur la bobine 3.

REVENDICATIONS

1. Moulinet de pêche avec bobine placée à l'extérieur et mue dans le sens de son axe, et avec enveloppe rotative de bobine, entraînée par l'intermédiaire d'une manivelle unique, caractérisé par le fait que l'enveloppe (2) de bobine présente un crochet entraîneur (7, 7b) sans articulations, ni points de montage ni ressorts, et par le fait que vers la position de rappel maximale de la bobine (3), l'extrémité libre du crochet entraîneur (7, 7b) s'engage, en attaquant dans la rainure (3a) formant épaulement ou dans la gorge ronde (3b) sur le bord orienté vers l'intérieur de la bobine (3), derrière le fil de ligne (8), accroche celui-ci et l'enroule sur la bobine (3) dans le sens de la flèche (2a).

2. Moulinet de pêche selon la revendication 1, caractérisé par le fait que la position la plus favorable pour le décrochage du fil de ligne (8) est atteinte par une rotation en arrière de la manivelle (roue dentée) jusqu'à l'arrêt créé par la saillie (4e) sur la roue dentée (4) qui vient buter sur le cliquet d'arrêt (10) élastique en position d'extraction maximale de la bobine, et par le fait que pour atteindre cela, il est avantageux que le rapport de démultiplication entre roue dentée (4) et pignon (2b) soit un nombre entier.

3. Moulinet de pêche selon les revendications 1 et 2, caractérisé par le fait que le crochet entraîneur (7, 7b) est positionnable par rapport à la rainure (3a) formant épaulement ou par rapport à la gorge ronde (3b) et que, dans la zone de la boucle arrondie du crochet entraîneur, peut être prévu un galet de glissement ou similaire.

4. Moulinet de pêche en partie selon les revendications précédentes, caractérisé par le fait que le crochet entraîneur (7, 7b) présente un joint articulé, le cas échéant placé sous l'action d'un ressort, pour qu'on puisse le faire pivoter hors de la zone d'enfilage.

Planche Unique

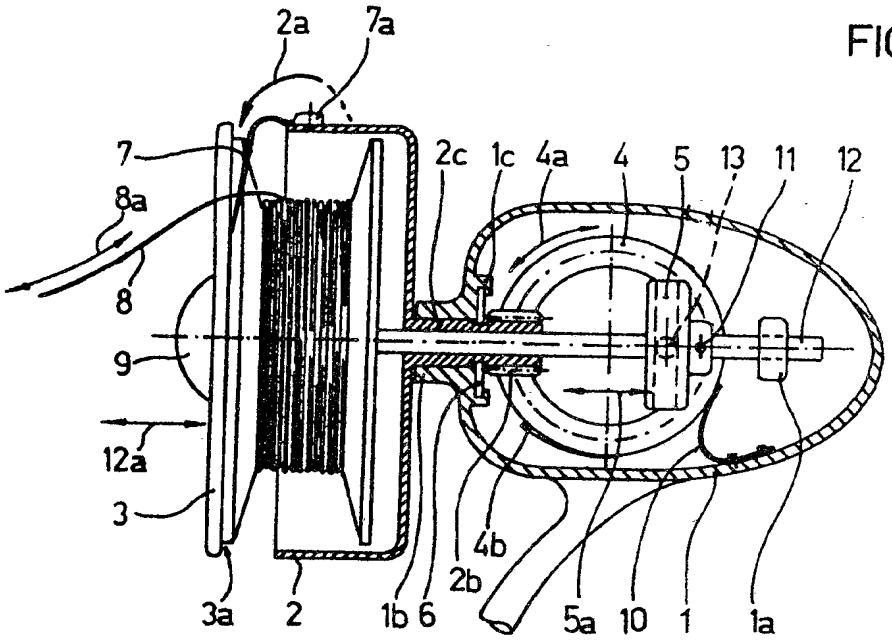


FIG. 1

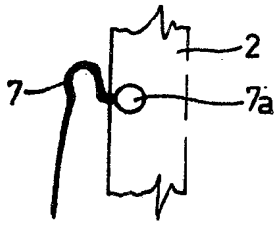


FIG. 2

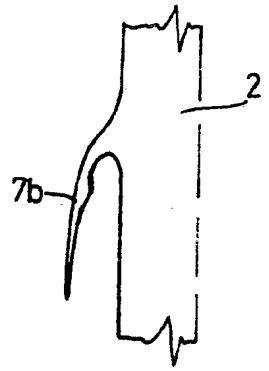


FIG. 3

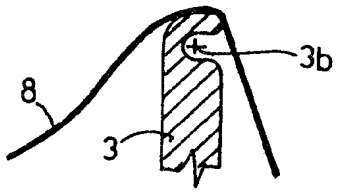


FIG. 4

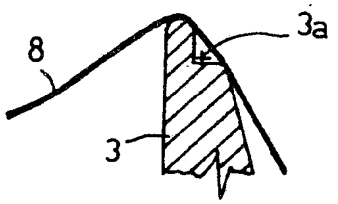


FIG. 5

Electronic Patent Application Fee Transmittal

Application Number:	12182705
Filing Date:	30-Jul-2008
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
Filer:	Jarett Dykes Millar/Jessica Molitor
Attorney Docket Number:	02316.2584USU2

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

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($)
Miscellaneous:				
Request for continued examination	1801	1	810	810
		Total in USD ($)		**810**

Electronic Acknowledgement Receipt

EFS ID:	7124272
Application Number:	12182705
International Application Number:	
Confirmation Number:	4252
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
Customer Number:	23552
Filer:	Jarett Dykes Millar/Jessica Molitor
Filer Authorized By:	Jarett Dykes Millar
Attorney Docket Number:	02316.2584USU2
Receipt Date:	02-MAR-2010
Filing Date:	30-JUL-2008
Time Stamp:	16:23:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$810
RAM confirmation Number	3130
Deposit Account	132725
Authorized User	MILLAR,JARETT D.

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

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	RCE_filed_3_2_10.PDF	20169 1ce51a9b84e5e1da2e87b36d00f7dea616740eab	no	1
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2		Supp_IDS_filed_3_2_10.PDF	45672 05630dd6070896cccc901482f17f074b5a5f84c2	yes	5

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Filed (SB/08)	3	5

Warnings:					
Information:					
3	Foreign Reference	JP2003114339A.PDF	4924455 e1b648b57fedaf01bd875770fff9d16ecf7177ac	no	8
Warnings:					
Information:					
4	Foreign Reference	FR2566997A1.PDF	279766 c093004b76df73f88580d097b51c1287cc9a1f86	no	7
Warnings:					
Information:					
5	Fee Worksheet (PTO-875)	fee-info.pdf	30619 a6f7b8bd3b6fa848c4b08623bae903e25a9f82e7	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	5300681		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

23552 7590 12/14/2009

MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

EXAMINER	
ULLAH, AKM E	
ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 12/14/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/182,705	07/30/2008	Scott C. Kowalczyk	02316.2584USU2	4252

TITLE OF INVENTION: FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1510	$300	$0	$1810	03/15/2010

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

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

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

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

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

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

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

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

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

23552 7590 12/14/2009

MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

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

Certificate of Mailing or Transmission

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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/182,705	07/30/2008	Scott C. Kowalczyk	02316.2584USU2	4252

TITLE OF INVENTION: FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1510	$300	$0	$1810	03/15/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
ULLAH, AKM E	2874	385-135000

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

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

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

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

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

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

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

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

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

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

❑ A check is enclosed.

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

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

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

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/182,705	07/30/2008	Scott C. Kowalczyk	02316.2584USU2	4252

23552 7590 12/14/2009

MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

EXAMINER	
ULLAH, AKM E	
ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 12/14/2009

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

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

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

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

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

Notice of Allowability	Application No.	Applicant(s)	
	12/182,705	KOWALCZYK ET AL.	
	Examiner	Art Unit	
	Akm Enayet Ullah	2874	

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

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

1. ☒ This communication is responsive to *10/27/2009*.

2. ☒ The allowed claim(s) is/are *1-3,5,6,8,11-13 and 16-26*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

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

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

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

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

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date See Continuation Sheet
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Akm Enayet Ullah/
Primary Examiner, Art Unit 2874

Continuation of Attachment(s) 3. Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date: 9/5/08,12/17/08,2/18/09,4/17/09 & 10/27/2009.

Reasons For Allowance

The following is an examiner's statement of reasons for allowance: Claims are allowed since certain key features of the claimed invention are not taught or fairly suggested by prior art. For an example , in claim 1 **a cable spool engaged with the bearing mount such that the cable spool selectively rotates within the housing about an axis, the cable spool having an axial end; and a plurality of adapters a termination module disposed on the axial end of the cable spool so that the termination module plurality of adapters rotates in unison with the cable spool; a cable management spool disposed on the axial end of the cable spool; and a fiber optic cable wrapped about a spooling portion of the cable spool, the fiber optic cable having an end portion including connector zed ends, the end portion being routed from the spooling portion of the cable spool, around the cable management spool, and engaged to first sides of the plurality of adapters**.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Akm Enayet Ullah whose telephone number is (571)272-2361. The examiner can normally be reached on Monday through Thursday from 6:30 to 5p.m.

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

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Akm Enayet Ullah/
Primary Examiner
Art Unit 2874

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12182705	KOWALCZYK ET AL.
	Examiner	Art Unit
	Akm E Ullah	2874

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

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

CLAIM		DATE								
Final	Original	06/17/2009	11/16/2009							
1	1	✓	=							
2	2	✓	=							
3	3	✓	=							
-	4	✓	-							
4	5	✓	=							
5	6	✓	=							
-	7	✓	-							
6	8	✓	=							
-	9	✓	-							
-	10	✓	-							
7	11	✓	=							
8	12	✓	=							
9	13	✓	=							
-	14	✓	-							
-	15	✓	-							
10	16	✓	=							
11	17	✓	=							
12	18		=							
13	19		=							
14	20		=							
15	21		=							
16	22		=							
17	23		=							
18	24		=							
19	25		=							
20	26		=							

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12182705	KOWALCZYK ET AL.
	Examiner	**Art Unit**
	Akm E Ullah	2874

ORIGINAL		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
385	135	G 0 2 B 6 / 00 (2006.01)	

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
385	147				

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

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	11	17												
2	2	12	18												
3	3	13	19												
-	4	14	20												
4	5	15	21												
5	6	16	22												
-	7	17	23												
6	8	18	24												
-	9	19	25												
-	10	20	26												
7	11														
8	12														
9	13														
-	14														
-	15														
10	16														

NONE (Assistant Examiner) (Date)	**Total Claims Allowed:** 20
/Akm E Ullah/ Primary Examiner.Art Unit 2874 (Primary Examiner) (Date)	O.G. Print Claim(s): 1 O.G. Print Figure: 17

EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	15	(fiber adj optic adj enclosure).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2009/11/16 13:05
L2	45	(housing near15 bearing adj mount).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2009/11/16 13:06
L3	0	(cable adj spool near15 housing near15 bearing adj mount).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2009/11/16 13:07
L4	0	(cable adj spool near15 bearing adj mount).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2009/11/16 13:07
L5	1	(cable adj spool same bearing adj mount).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2009/11/16 13:07
L6	13	(cable adj management adj spool).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2009/11/16 13:08
L7	387	(adapters near15 axial adj end naer5 cable adj spool).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2009/11/16 13:09
L8	0	2 and 3 and 7	US-PGPUB; USPAT; UPAD	OR	OFF	2009/11/16 13:09

11/16/2009 1:09:55 PM
C:\Documents and Settings\AUllah\My Documents\EAST\Workspaces\12114004.wsp

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 02316.2584USU2	Application Number: 12/182,705
	Applicant: Kowalczyk et al.	
	Filing Date: July 30, 2008	Group Art Unit: 2874

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	2007/0165995	07/19/2007	Reagan et al.			
	6,522,826	02/18/2003	Gregory			
	6,856,748	02/15/2008	Elkins, II et al.			
	7,315,681	01/01/2008	Kewitsch			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

		7 Inch Modules, ADC Telecommunications, Inc, © 1998, "7 Inch Connector Module with IFC", pp. 127
		F3DF Modules, ADC Telecommunications, Inc. © 1995, "Individual 12-Pack Assemblies", pp. 90
		Fiber Cable Management Products, Third Edition, ADC Telecommunications, Inc., © 1995, 1998
		Fiber Distribution Frame, Pre-Terminated Rear Load Connector Module, Installation Instructions, ADC Telecommunications, Inc., © 2000
		Fiber Main Distribution Frame (FMDF), Fiber Terminal Block, Installation Instructions, ADC Telecommunications, Inc., © 2001
		Fiber Panel Products, Second Edition, ADC Telecommunications, Inc., © 1994, 1996

EXAMINER /Akm Ullah/	DATE CONSIDERED 11/25/2009

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 02316.2584USU2	Application Number: 12/182,705
	Applicant: Kowalczyk et al.	
	Filing Date: July 30, 2008	Group Art Unit: 2874

		Fiber Panel Products - Cable Management Tray Panels, ADC Telecommunications, Inc., © 1994, 1996 "72 Fiber Distribution Module (FDM) with Intrafacility Fiber Cable", pp. 56
		FL2000 Products, ADC Telecommunications, Inc., © 1994, 1996
		FL2000 Products, ADC Telecommunications, Inc., © 1994, 1996, "Rack Mount Panel with Intrafacility Fiber Cable", pp. 16
		FL2000 Products – Preconfigured Panels, ADC Telecommunications, Inc., © 2000 "Rack or Cabinet Mount Termination Panel with Multifiber Cable", pp. 13
		Next Generation Frame (NGF), Product Family Ordering Guide, ADC Telecommunications, Inc., © 1996, 1999, 2000, "Fiber Termination Blocks (FTB) Preterminated", pp. 8
		Next Generation Frame (NGF), Product Family Ordering Guide, ADC Telecommunications, Inc., © 1996, 1999, 2000
		Next Generation Frames - Fiber Termination Blocks, ADC Telecommunication, Inc., © 1998, "Fiber Termination Blocks (FTB) Preterminated" pp. 6
		Value-Added Module System, ADC Telecommunications, Inc., © 1993, 1194, 1998, "12-Pack Module Assemblies", pp. 30-31
		IFC Style Frame Modules, ADC Telecommunications, Inc., © 1995, "Connector Module Equipped with IFC", pp. 27
		Description of Admitted Prior Art, 30 pages

23552
PATENT TRADEMARK OFFICE

EXAMINER /Akm Ullah/	DATE CONSIDERED 11/25/2009

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.U./

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12182705	KOWALCZYK ET AL.
	Examiner	Art Unit
	Akm E Ullah	2874

SEARCHED			
Class	Subclass	Date	Examiner
385	135-139	6-15-2009	AU
Updated above	135-139	11/16/2009	AU

SEARCH NOTES		
Search Notes	Date	Examiner
EAST SEARCH HISTORY	6/11/2009	AU
INVENTOR and ASSIGNEE and updated above	11/16/2009	AU

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
385	135-139	11/16/2009	AU

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 2316.2584USU2	Application Number: 12/182,705
	Applicant: KOWALCZYK ET AL.	
	Filing Date: 07/30/2008	Group Art Unit: 2874

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	7,346,253 B2	03/18/2008	Bloodworth et al.			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

23552
PATENT TRADEMARK OFFICE

EXAMINER	/Akm Ullah/	DATE CONSIDERED	12/09/2009

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 2316.2584USU2	Application Number: 12/182,705
	Applicant: KOWALCZYK ET AL.	
	Filing Date: 07/30/2008	Group Art Unit: 2874

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	3,920,308	11/18/1975	Murray			
	4,940,859	07/10/1990	Peterson			
	5,494,446	02/27/1996	DeLucia et al.			
	5,522,561	06/04/1996	Koyamatsu et al.			
	5,717,810	02/10/1998	Wheeler			
	2006/0210230 A1	09/21/2006	Kline et al.			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
	1 107 031 A1	06/13/2001	EP				

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

		International Search Report and Written Opinion mailed March 18, 2009

23552
PATENT TRADEMARK OFFICE

EXAMINER /Akm Ullah/	DATE CONSIDERED 12/09/2009

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Receipt date: 09/05/2008

12182705 - GAU: 2874

Date: SEPTEMBER 5, 2008

Sheet 1 of 1

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 2316.2584USU2	Application Number: 12/182,705
	Applicant: KOWALCZYK ET AL.	
	Filing Date: 07/30/2008	Group Art Unit: UNKNOWN

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	4,913,369	04/03/1990	Lia et al.			
	5,638,481	06/10/1997	Arnett			
	5,987,203	11/16/1999	Abel et al.			
	6,220,413 B1	04/24/2001	Walters et al.			
	2004/0170369 A1	09/02/2004	Pons			
	2005/0213920 A1	09/29/2005	Tanaka et al.			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
	42 26 368 A1	02/10/1994	DE			Abstract	
	9-236709	09/09/1997	JP			Abstract	
	11-349230	12/21/1999	JP			Abstract	
	2005-73365	03/17/2005	JP			Abstract	
	2005-249858	09/15/2005	JP			Abstract	

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

		International Search Report and Written Opinion mailed August 8, 2008

23552
PATENT TRADEMARK OFFICE

EXAMINER	/Akm Ullah/	DATE CONSIDERED	12/09/2009

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449)

Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.U./

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 2316.2584USU2	Application Number: 12/182,705
	Applicant: KOWALCZYK ET AL.	
	Filing Date: 07/30/2008	Group Art Unit: UNKNOWN

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	2,727,703	12/20/1955	Bonnett			
	6,669,129 B1	12/30/2003	Shah			
	2006/0183362 A1	08/17/2006	Mullaney et al.			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

		International Search Report and Written Opinion mailed November 18, 2008

23552
PATENT TRADEMARK OFFICE

EXAMINER	/Akm Ullah/	DATE CONSIDERED	12/09/2009

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 02316.2584USU2	Application Number: 12/182,705
	Applicant: Kowalczyk et al.	
	Filing Date: July 30, 2008	Group Art Unit: 2874

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	2007/0165995	07/19/2007	Reagan et al.			
	6,522,826	02/18/2003	Gregory			
	6,856,748	02/15/2008	Elkins, II et al.			
	7,315,681	01/01/2008	Kewitsch			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

		7 Inch Modules, ADC Telecommunications, Inc, © 1998, "7 Inch Connector Module with IFC", pp. 127
		F3DF Modules, ADC Telecommunications, Inc. © 1995, "Individual 12-Pack Assemblies", pp. 90
		Fiber Cable Management Products, Third Edition, ADC Telecommunications, Inc., © 1995, 1998
		Fiber Distribution Frame, Pre-Terminated Rear Load Connector Module, Installation Instructions, ADC Telecommunications, Inc., © 2000
		Fiber Main Distribution Frame (FMDF), Fiber Terminal Block, Installation Instructions, ADC Telecommunications, Inc., © 2001
		Fiber Panel Products, Second Edition, ADC Telecommunications, Inc., © 1994, 1996

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 02316.2584USU2	Application Number: 12/182,705
	Applicant: Kowalczyk et al.	
	Filing Date: July 30, 2008	Group Art Unit: 2874

		Fiber Panel Products - Cable Management Tray Panels, ADC Telecommunications, Inc., © 1994, 1996 "72 Fiber Distribution Module (FDM) with Intrafacility Fiber Cable", pp. 56
		FL2000 Products, ADC Telecommunications, Inc., © 1994, 1996
		FL2000 Products, ADC Telecommunications, Inc., © 1994, 1996, "Rack Mount Panel with Intrafacility Fiber Cable", pp. 16
		FL2000 Products – Preconfigured Panels, ADC Telecommunications, Inc., © 2000 "Rack or Cabinet Mount Termination Panel with Multifiber Cable", pp. 13
		Next Generation Frame (NGF), Product Family Ordering Guide, ADC Telecommunications, Inc., © 1996, 1999, 2000, "Fiber Termination Blocks (FTB) Preterminated", pp. 8
		Next Generation Frame (NGF), Product Family Ordering Guide, ADC Telecommunications, Inc., © 1996, 1999, 2000
		Next Generation Frames - Fiber Termination Blocks, ADC Telecommunication, Inc., © 1998, "Fiber Termination Blocks (FTB) Preterminated" pp. 6
		Value-Added Module System, ADC Telecommunications, Inc., © 1993, 1194, 1998, "12-Pack Module Assemblies", pp. 30-31
		IFC Style Frame Modules, ADC Telecommunications, Inc., © 1995, "Connector Module Equipped with IFC", pp. 27
		Description of Admitted Prior Art, 30 pages

23552
PATENT TRADEMARK OFFICE

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Electronic Patent Application Fee Transmittal

Application Number:	12182705
Filing Date:	30-Jul-2008
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
Filer:	Jarett Dykes Millar/Jessica Molitor
Attorney Docket Number:	02316.2584USU2

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

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($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	6342271
Application Number:	12182705
International Application Number:	
Confirmation Number:	4252
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
Customer Number:	23552
Filer:	Jarett Dykes Millar/Jessica Molitor
Filer Authorized By:	Jarett Dykes Millar
Attorney Docket Number:	02316.2584USU2
Receipt Date:	27-OCT-2009
Filing Date:	30-JUL-2008
Time Stamp:	18:37:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$180
RAM confirmation Number	4893
Deposit Account	132725
Authorized User	MILLAR,JARETT D.

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

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Supp_IDS_filed_10_27_09.PDF	77078 a6e71b2887350344cdba3019136b1073e2a96df0	yes	4
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Filed (SB/08)		3	4	
Warnings:					
Information:					
2	NPL Documents	7_Inch_Modules_1998.PDF	99691 aaa34b62d126a3f42755796dd6a3f481c4248269	no	1
Warnings:					
Information:					
3	NPL Documents	F3DF_Modules_1995.PDF	90782 f36599bb94a0acd87ca30bf8cd573698567c12ec	no	1
Warnings:					
Information:					
4	NPL Documents	Fiber_Distribution_Frame_2000_2.PDF	320954 b982ea85b97de32c8c7dbf8cb311700237d8fb68	no	8
Warnings:					
Information:					
5	NPL Documents	Fiber_Main_Distribution_Frame_FMDF_2001.PDF	651136 b43fbc431ca4a0b752d9d26396037c0478f94903	no	15
Warnings:					
Information:					
6	NPL Documents	Fiber_Panel_Products_Cable_Management_Tray_Panels_1996.PDF	97181 33a635c6f4286746f5af22edff58424d02893a7b	no	1
Warnings:					
Information:					
7	NPL Documents	FL2000_Products_1994-1996.PDF	1392734 6fb53be676fbc2cb8f3dae1710669164c666bb2d	no	4
Warnings:					
Information:					

8	NPL Documents	FL2000_System_Preconfirgured_Panels_2000.PDF	65931 6bc4005752f28a5f6a4a7a521c25bd938b2be7dd	no	1
Warnings:					
Information:					
9	NPL Documents	Next_Generation_Frame_NGF_1996-1999-2000.PDF	3313738 e529a10d4049f2d016bfb866b79c818ad6984f73	no	37
Warnings:					
Information:					
10	NPL Documents	Next_Generation_Frames_Fiber_Termination_Blocks_FTB_Preterminated_2000.PDF	95672 466558621f11c9877fb59aae1fb62862d10dd581	no	1
Warnings:					
Information:					
11	NPL Documents	Next_Generation_Frames_Fiber_Termination_Blocks_1998.PDF	64477 1606702beea0394f0dff1523f3d8fbcb2732e880	no	1
Warnings:					
Information:					
12	NPL Documents	IFC_Style_Frame_Modules_1995.PDF	215258 cc36aeb55017949083a2a46050104c4be5322220	no	1
Warnings:					
Information:					
13	NPL Documents	Description_of_Admitted_Prior_Art.PDF	1693078 740a791aa85a5166f50a73abc8516e8dd1458723	no	30
Warnings:					
Information:					
14	NPL Documents	Fiber_Cable_Management_Products-Third_Edition_1995-1998.PDF	8518916 c2a70e53f603232e02600e72cd8cb478ead51d1f	no	142
Warnings:					
Information:					
15	NPL Documents	Fiber_Panel_Products-Second_Edition_1994-1996.PDF	16575252 b2dbd1c6422e749c1b525fbf1dd4445c74994988	no	117
Warnings:					
Information:					
16	NPL Documents	Value_Added_Module_System_1993-1994-1998.PDF	1338925 3ca254a4a1d0c04c49bde85d7e60d5c8f1ad86d7	no	4
Warnings:					
Information:					

17	NPL Documents	FL2000_Products_Rack_Mount_Panel.PDF	83172 557e8320fc8e4dc0422cc0bb0562fdd474dd6940	no	1
Warnings:					
Information:					
18	Fee Worksheet (PTO-875)	fee-info.pdf	30542 7df4545cdf144f6f79110cddc6e78afb06a14f2b	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	34724517	

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Kowalczyk et al.	Examiner:	Ullah, Akm E.
Serial No.:	12/182,705	Group Art Unit:	2874
Filed:	July 30, 2008	Docket No.:	02316.2584USU2
Customer No.:	23552	Confirmation No.:	4252
Title:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL		

Filed EFS-WEB

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT (37 C.F.R. § 1.97(c))

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

With regard to the above-identified application, the items of information listed on the enclosed Form 1449 are brought to the attention of the Examiner.

This statement should be considered because it is submitted after the mailing date of a first Office Action on-the-merits or a first Office Action after filing a Request for Continued Examination under 37 C.F.R. § 1.114 or a CPA under 37 C.F.R. § 1.53(d), but before the mailing date of: i) a final action under 37 C.F.R. § 1.113; ii) a Notice of Allowance under 37 C.F.R. § 1.311; or iii) an action that otherwise closes prosecution on the application. Payment in the amount of $180.00 under 37 C.F.R. § 1.17(p) is being submitted via credit card for consideration of the items listed on the enclosed Form 1449.

In accordance with 37 C.F.R. §1.98(a)(2), a copy of each foreign patent and/or a copy of each publication, other than U.S. patents and U.S. patent application publications, listed on the accompanying Form 1449 is enclosed.

No representation is made that a reference is "prior art" within the meaning of 35 U.S.C. §§ 102 and 103 and Applicants reserve the right, pursuant to 37 C.F.R. § 1.131 or otherwise, to establish that the reference(s) are not "prior art." Moreover, Applicants do not represent that a

reference has been thoroughly reviewed or that any relevance of any portion of a reference is intended.

Consideration of the items listed is respectfully requested. Pursuant to the provisions of M.P.E.P. 609, it is requested that the Examiner return a copy of the attached Form 1449, marked as being considered and initialed by the Examiner, to the undersigned with the next official communication.

Please charge any additional fees or credit any overpayment to Deposit Account No. 13-2725.

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, Minnesota 55402-0903
(612) 332-5300

Date: October 27, 2009

/Jarett D. Millar/
Jarett D. Millar
Reg. No. 57,679
JDM:jrm

23552
PATENT TRADEMARK OFFICE

IPR2025-01119
Page 97 of 332 **Belden EX1006**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Kowalczyk et al.	Examiner:	Ullah, Akm E.
Serial No.:	12/182,705	Group Art Unit:	2874
Filed:	07/30/2008	Docket No.:	02316.2584USU2
Customer No.:	23552	Confirmation No.:	4252
Title:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL		

AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

In response to the Office Action mailed June 19, 2009, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims that begins on page 2 of this paper.

Amendments to the Drawings begin on page 7 of this paper and include an attached replacement sheet following page 13 of this paper.

Remarks begin on page 8 of this paper.

Amendments to the Claims:

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

Listing of Claims:

1. (Currently Amended) A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing having an interior region;

a bearing mount disposed in the interior region of the housing;

a cable spool engaged with the bearing mount such that the cable spool selectively rotates within the housing about an axis, the cable spool having an axial end; ~~and~~

a plurality of adapters ~~a termination module~~ disposed on the axial end of the cable spool so that the ~~termination module~~ plurality of adapters rotates in unison with the cable spool;

a cable management spool disposed on the axial end of the cable spool; and

a fiber optic cable wrapped about a spooling portion of the cable spool, the fiber optic cable having an end portion including connectorized ends, the end portion being routed from the spooling portion of the cable spool, around the cable management spool, and engaged to first sides of the plurality of adapters.

2. (Original) A fiber optic enclosure assembly as claimed in claim 1, wherein a needle bearing is disposed on an outer surface of the bearing mount.

3. (Currently Amended) A fiber optic enclosure assembly as claimed in claim 1, wherein the ~~termination module~~ plurality of adapters is engaged with an adapter slot defined by ~~includes~~ an adapter plate ~~having an adapter slot with a plurality of adapters engaged with the adapter slot~~.

4. (Canceled)

IPR2025-01119
Page 99 of 332
Belden EX1006

5. (Currently Amended) A fiber optic enclosure assembly as claimed in claim 1, wherein [[an]] the axial end of the cable spool defines a cable passage.

6. (Currently Amended) A fiber optic enclosure assembly as claimed in claim 1, wherein [[an]] the axial end of the cable spool and the cable management spool cooperatively define a cable passage. ~~defines a slack storage area.~~

7. (Canceled)

8. (Currently Amended) A method of paying out a fiber optic cable from a fiber optic enclosure, comprising:

mounting a fiber optic enclosure to a wall, the fiber optic enclosure including a housing defining an interior region, the fiber optic enclosure including a cable spool disposed in the interior region, the cable spool being adapted to rotate within the interior region about an axis of the housing that is perpendicular to the wall; and

rotating [[a]] the cable spool, which includes a fiber optic cable coiled around a spooling portion of the cable spool, about [[an]] the axis of [[a]] the housing of [[a]] the fiber optic enclosure until a desired length of fiber optic cable is paid out, the cable spool ~~being disposed in an interior region of the housing and~~ having a plurality of adapters disposed on an axial end of ~~termination module disposed on~~ the cable spool and a cable management spool disposed on the axial end.

9. (Canceled)

10. (Canceled)

11. (Currently Amended) A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim [[10]] 8, wherein the ~~termination module~~ plurality of adapters is

disposed in an adapter slot defined by ~~includes~~ an adapter plate ~~having an adapter slot with the plurality of adapters engaged with the adapter slot~~ mounted to the axial end of the cable spool.

12. (Currently Amended) A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim [[10]] 8, where the ~~termination module includes~~ the plurality of adapters are disposed in a plurality of sliding adapter modules.

13. (Currently Amended) A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein connectorized ends of a first end of the fiber optic cable are connected to the plurality of adapters disposed ~~in the termination module~~ on the cable spool.

14. (Canceled)

15. (Canceled)

16. (Original) A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, further comprising fixing the position of the cable spool with respect to the housing when the desired length of fiber optic cable has been paid out.

17. (Original) A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 16, wherein a pin fixes the position of the cable spool with respect to the housing.

18. (New) A fiber optic enclosure assembly as claimed in claim 1, wherein the cable management spool includes a plurality of fingers that extend outwardly from an end of the cable management spool.

19. (New) A fiber optic enclosure assembly as claimed in claim 1, wherein the axial end of the cable spool includes an outer guide wall that extends outwardly from the axial end in a

direction that is generally perpendicular to the axial end, the outer guide wall being disposed adjacent to the cable management spool.

20. (New) A fiber optic enclosure assembly as claimed in claim 1, wherein the bearing mount is disposed on a base of the housing so that the axis about which the cable spool rotates is offset from a center of the base of the housing.

21. (New) A fiber optic network comprising:

a fiber optic enclosure including:

a housing having an interior region;

a bearing mount disposed in the interior region of the housing;

a cable spool engaged with the bearing mount such that the cable spool selectively rotates within the housing, the cable spool having an axial end;

a plurality of adapters disposed on the axial end of the cable spool so that the plurality of adapters rotates in unison with the cable spool, each of the plurality of adapters having a first side and an oppositely disposed second side;

a fiber optic cable wrapped around the cable spool, the fiber optic cable including a first end and a second end, the first end having a plurality of connectors engaged to the first sides of the plurality of adapters, the second end having a multi-fiber connector; and

a fiber distribution hub in connected engagement with the multi-fiber connector of the fiber optic cable.

22. (New) A fiber optic network as claimed in claim 21, wherein the fiber distribution hub includes one or more optical splitters.

23. (New) A fiber optic network as claimed in claim 21, further comprising a feeder cable in connected engagement with the fiber distribution hub.

24. (New) A fiber optic network as claimed in claim 21, further comprising a cable management spool disposed on the axial end of the cable spool.

25. (New) A fiber optic network as claimed in claim 21, wherein the fiber optic enclosure is mounted to a wall of a facility.

26. (New) A fiber optic network as claimed in claim 25, wherein the fiber distribution hub is located on a lower level of the facility.

IPR2025-01119
Page 103 of 332
Belden EX1006

Amendments to the Drawings:

The sheet of drawings attached in the Appendix includes changes to FIG. 17. This sheet replaces the original sheet. The drawings have been changed as follows:

In FIG. 17, reference numeral 183 has been added. Reference numeral 183 is described in the paragraph beginning on line 27 of page 11 of the originally filed application. Therefore, it is respectfully asserted that no new matter has been added to FIG. 178.

REMARKS

The Office Action mailed June 19, 2009 and the references cited therein have been reviewed and considered. Claims 1-3, 5, 6, 8, 11-13 and 16-26 are pending. Claims 1, 3, 5, 6, 8 and 11-13 have been amended. Claims 4, 7, 9, 10, 14 and 15 have been canceled. Claims 18-26 have been added.

Objection to Drawings

In the Office Action, the drawings were objected to as failing to comply with 37 CFR § 1.84(p)(5) since reference numeral 183 is not included in the drawings. FIG. 17 has been amended to include reference numeral 183.

In the Office Action, the drawings were objected to as failing to comply with 37 CFR § 1.84(p)(5) since reference numeral 181 is not included in the drawings. This objection is respectfully traversed. Reference numeral 181 is provided in FIG. 18 of the drawings as filed on December 2, 2008.

Therefore, as FIG. 17 has been amended to include reference numeral 183 and as reference numeral 181 is provided on FIG. 18 of the drawings as filed on Dec. 2, 2008, withdrawal of the objection to the drawings is respectfully requested.

35 U.S.C. § 102 Rejection

In the Office Action, Claims 1, 8 and 15 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Application Publication No. 20060210230 (Kline et al.). This rejection is respectfully traversed.

In order for a reference to anticipate a claim, the prior art reference must teach each and every element of the claim. *Verdegall Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987; MPEP § 2131). Furthermore, "Because the hallmark of anticipation is prior invention, the prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only

disclose all elements of the claim within the four corners of the document, but must also disclose those elements 'arranged as in the claim'". NetMoneyIn, Inc. v. Verisign, Inc., 545 F.3d 1359, 1369 (Fed. Cir. 2008) (quoting Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 1548 (Fed. Cir. 1983)).

It is respectfully asserted that all of the recitations of claim 1 are not disclosed by Kline et al. Claim 1 has been amended to recite a cable spool engaged with the bearing mount such that the cable spool selectively rotates within the housing about an axis, the cable spool having an axial end; a cable management spool disposed on the axial end of the cable spool; and a plurality of adapters disposed on the axial end of the cable spool so that the plurality of adapters rotates in unison with the cable spool.

Kline et al. disclose a cable having a free end that is fixed with a conventional fitting or connector 13. See paragraph [0024] of Kline et al. Kline et al. further disclose a primary coil 5 and a secondary coil 7. After the cable is unwound from the primary coil 5, the connector 13 and the adjacent part of the cable is manually unwrapped from the secondary coil 7 and routed to the selected equipment unit. See paragraph [0038] of Kline et al.

Kline et al. do not disclose a plurality of adapters disposed on the axial end of the cable spool, a cable management spool disposed on the axial end of the cable spool, or a fiber optic cable having an end portion that is routed from the spooling portion of the cable spool, around the cable management spool and engaged to first sides of the plurality of adapters. It is respectfully asserted that Kline et al. teach away from such a configuration by requiring the cable to be manually unwrapped from the secondary coil and routed to the selected equipment unit.

Therefore, as Kline et al. do not disclose every element of claim 1, it is respectfully asserted that Kline et al. do not anticipate claim 1. Withdrawal of the § 102(b) rejection is respectfully requested.

Claim 8 has been amended to recite in part "mounting a fiber optic enclosure to a wall, the fiber optic enclosure including a housing defining an interior region, the fiber optic enclosure

including a cable spool disposed in the interior region, the cable spool being adapted to rotate within the interior region about an axis of the housing that is perpendicular to the wall...the cable spool having a plurality of adapted disposed on an axial end of the cable spool and a cable management spool disposed on the axial end." It is respectfully asserted that Kline et al. do not disclose all the elements of claim 8.

Kline et al. do not disclose a plurality of adapters disposed on the axial end of the cable spool. Rather, Kline et al. require the cable to be manually unwrapped from the secondary coil and routed to a remote selected equipment unit. See paragraph [0038] of Kline et al. Therefore, as Kline et al. do not disclose all the elements of claim 8, it is respectfully asserted that Kline et al. does not anticipate claim 8. Withdrawal of the § 102(b) rejection of claim 8 is respectfully requested.

Claim 15 has been canceled.

In the Office Action, claims 1, 6-10, 13-14, 16 and 17 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,220,413 (Walters et al.). This rejection is respectfully traversed.

Claim 1 recites a cable management spool disposed on the axial end of the cable spool and a fiber optic cable wrapped about a spooling portion of the cable spool, the fiber optic cable having an end portion including connectorized ends, the end portion being routed from the spooling portion of the cable spool, around the cable management spool, and engaged to first sides of the plurality of adapters. It is respectfully asserted that Walters et al. do not disclose all the elements of claim 1.

Walters et al. disclose a reel 11 having a reel docking station 47 for a connector panel 53. See col. 2, lines 23-59 of Walters et al. After the cable 23 is unwound from the reel 11, the technician removes the connector panel 53 from the reel docking station 47 and mounts it to a frame docking station 43, which is located remotely from the reel 11. See col. 4, lines 46-61 of Walters et al. To respool the cable 23, the technician moves the connector panel 53 from the

frame docking station 43 to the reel docking station 47. Walters et al. do not disclose a cable management spool disposed on an axial end of the cable spool. Given the transient nature of the connector panel 53, it is respectfully asserted that the inclusion of a cable management spool on an axial end of the cable spool is counterintuitive.

Therefore, as Walters et al. do not disclose all of the elements of claim 1, it is respectfully asserted that Walters et al. do not anticipate claim 1. Withdrawal of the § 102(b) rejection of claim 1 is respectfully requested.

As claims 6 and 7 are dependent on claim 1, it is respectfully asserted that Walters et al. do not anticipate claims 6 and 7 for at least the reasons provided above. Withdrawal of the § 102(b) rejection of claims 6 and 7 is respectfully requested.

Claim 8 has been amended to recite in part "mounting a fiber optic enclosure to a wall, the fiber optic enclosure including a housing defining an interior region, the fiber optic enclosure including a cable spool disposed in the interior region, the cable spool being adapted to rotate within the interior region about an axis of the housing that is perpendicular to the wall...the cable spool having a plurality of adapted disposed on an axial end of the cable spool and a cable management spool disposed on the axial end." It is respectfully asserted that Walters et al. do not disclose all the elements of claim 8.

As provided above, Walters et al. do not disclose a cable management spool disposed on an axial end of a cable spool. In addition, Walters et al. do not disclose mounting the cable storage device to a wall so that a rotation axis of the cable spool is perpendicular to the wall. Therefore, as Walters et al. do not disclose the elements as arranged in claim 8, it is respectfully asserted that Walters et al. do not anticipate claim 8. Withdrawal of the § 102(b) rejection of claim 8 is respectfully requested.

As claims 13, 16 and 17 are dependent on claim 8, it is respectfully asserted that Walters et al. do not anticipate claims 13, 16 and 17 for at least the reasons provided above. Withdrawal of the § 102(b) rejection is respectfully requested.

Claims 9, 10 and 14 have been canceled.

35 U.S.C. § 103 Rejection

In the Office Action, claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,220,413 (Walters et al.) in view of U.S. Patent No. 5,519,275 (Scott et al.). This rejection is respectfully traversed.

Claim 2 is dependent on claim 1. Scott et al. do not disclose, suggest or provide any reason to modify the teachings of Walters et al. to include a cable management spool disposed on the axial end of the cable spool. Therefore as Walters et al. and Scott et al. do not disclose the elements of claim 2, it is respectfully asserted that a prima facie case of obviousness has not been established. Withdrawal of the § 103(a) rejection of claim 2 is respectfully requested.

In the Office Action, claims 3-5 and 11-12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,220,413 (Walters et al.) in view of U.S. Patent No. 5,551,545 (Gelfman). This rejection is respectfully traversed.

Claims 3 and 5 are dependent on claim 1. Gelfman does not disclose, suggest or provide any reason to modify the teachings of Walters et al. to include a cable management spool disposed on the axial end of the cable spool. In addition, while Gelfman discloses a gear plate 34 and a rotating joint fastening plate 50 in columns 7 and 8, Gelfman does not disclose, suggest or provide any reason to modify the teachings of Walters et al. to include an adapter plate having an adapter slot engaged to a plurality of adapters as claimed in claim 3. Therefore, it is respectfully asserted that a prima facie case of obviousness has not been established with respect to claims 3 and 5. Withdrawal of the § 103(a) rejection of claims 3 and 5 is respectfully requested.

Claims 11 and 12 are dependent on claim 8. Gelfman does not disclose, suggest or provide any reason to modify the teachings of Walters et al. to include a cable management spool disposed on the axial end of the cable spool. Therefore, it is respectfully asserted that a prima

facie case of obviousness has not been established with respect to claims 11 and 12. Withdrawal of the § 103(a) rejection of claims 11 and 12 is respectfully requested.

In view of the above amendments and remarks, Applicant respectfully requests a Notice of Allowance. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at the below-listed telephone number.

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, Minnesota 55402-0903
(612) 332-5300

Date: September 21, 2009

/Jarett D. Millar/
Jarett D. Millar
Reg. No. 57,679

23552
PATENT TRADEMARK OFFICE

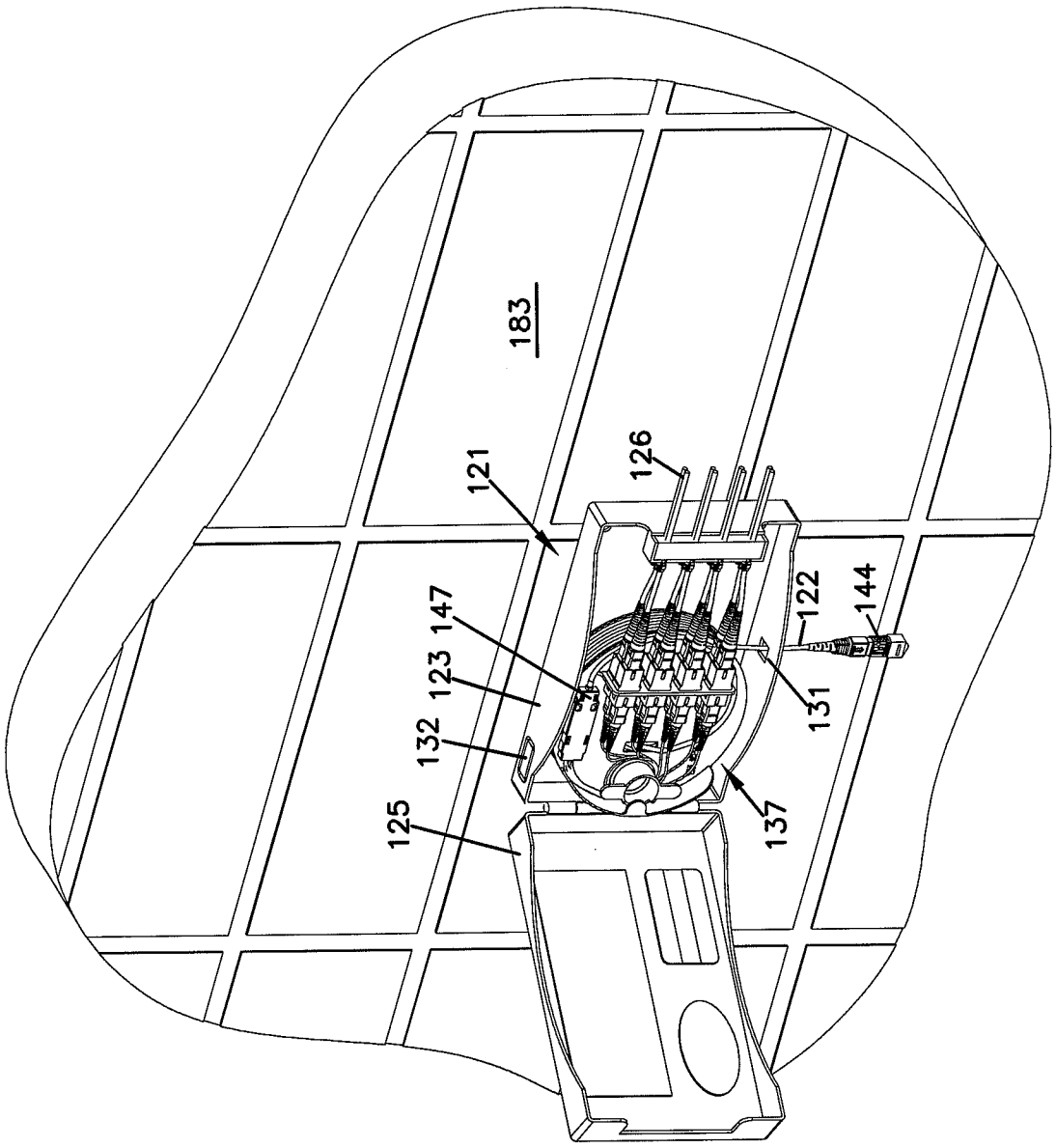


FIG. 17

Electronic Acknowledgement Receipt

EFS ID:	6111572
Application Number:	12182705
International Application Number:	
Confirmation Number:	4252
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
Customer Number:	23552
Filer:	Jarett Dykes Millar/Jessica Molitor
Filer Authorized By:	Jarett Dykes Millar
Attorney Docket Number:	02316.2584USU2
Receipt Date:	21-SEP-2009
Filing Date:	30-JUL-2008
Time Stamp:	15:53:35
Application Type:	Utility under 35 USC 111(a)

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		Amendment_filed_9_21_09.PDF	515743 efe54f86446eca12691296fc888c31d74cf16076	yes	14

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	6
	Drawings-only black and white line drawings	7	7
	Applicant Arguments/Remarks Made in an Amendment	8	13
	Drawings-only black and white line drawings	14	14
Warnings:			
Information:			
	Total Files Size (in bytes):	515743	

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.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
12/182,705	07/30/2008	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 09/21/2009	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X $ =		OR	X $52=	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $ =		OR	X $220=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

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

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

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

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

Legal Instrument Examiner:
/FRANCES Y. FIELDS/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/182,705	07/30/2008	Scott C. Kowalczyk	02316.2584USU2	4252

23552 7590 06/19/2009

MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

EXAMINER	
ULLAH, AKM E	
ART UNIT	PAPER NUMBER
2874	

MAIL DATE	DELIVERY MODE
06/19/2009	PAPER

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

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

Office Action Summary	Application No.	Applicant(s)	
	12/182,705	KOWALCZYK ET AL.	
	Examiner	Art Unit	
	Akm Enayet Ullah	2874	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

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

Status

1)☒ Responsive to communication(s) filed on *17 April 2009*.

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

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

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

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

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

Application Papers

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

10)☒ The drawing(s) filed on *30 July 2008* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

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

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

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :9/15/08, 12/17/08, 12/18/09 & 4/17/09.

Detailed Actions

Applicant cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Status of the application

Claims 1-17 are pending in this application.

If applicant is aware of any prior art or any other co-pending application not already of record, he/she is reminded of his/her duty under 36 CFR 1.56 to disclose the same.

If applicant provides prior art, he/she is requested to cite it on form PTOL_1449 in accordance with guideline set forth in MPEP 609.

Cross-Reference to Related Application

This application claims the benefit of U.S. provisional Patent Application Ser. Nos. 60/954, 214, filed August06, 207 and 61/029, 248, and filed on February 15, 2008, both of which are hereby incorporated by reference in their entirety.

Drawings Objected To, Reference Numbers Not in Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: numeral 183 as mentioned in paragraph (0058)of the specification. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to

the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Drawings are also Objected To, Reference Numbers Not in the specification

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: numeral 181 as mentioned in figure 18. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and

informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Rejections Under 35 USC 102

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

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

Claims 1, 8 and 15 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kline et al (USPUB. NO. 2006/0210230).

Regarding claim 1, Kline et al discloses a fiber optic enclosure assembly for enclosing optical fiber connections comprising:

- a housing having an interior region; a bearing mount disposed in the interior region of the housing; (Paragraph 0009 of the reference),
  a cable spool (Paragraph 0009 of the reference), engaged with the bearing mount such that the cable spool selectively rotates within the housing (Paragraph 0009 of the reference), and
  a termination module (Paragraph 0009 of the reference), disposed on the cable spool so that the termination module rotates in unison with the cable spool.

Regarding claim 8, Kline et al discloses **a** method of paying out a fiber optic cable from a fiber optic enclosure, comprising:

- rotating a cable spool (Paragraph 0009 of the reference), which includes a fiber optic cable (lines 4 and 16 of paragraph 0009 of the reference) coiled around a spooling portion of the cable spool, about an axis of a housing of a fiber optic (Paragraph 0009 of the reference) enclosure until a desired length of fiber optic cable is paid out, the cable spool being disposed in an interior region of the housing and having a termination module disposed on the cable spool.

  Regarding claim 15, Kline et al discloses wherein the fiber optic enclosure is packaged

- in a shipping container during pay out of the fiber optic cable. This is an inherent in the fiber optic cable in a shipping container which is also mentioned in line 2 of paragraph 0009 of the reference, in paragraph 0006.

Claims 1, 6-10, 13-14, 16 and 17 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Walters et al (USPNO. 6,220,413).

Regarding claims 1 and 8, W alters et al discloses a fiber optic enclosure assembly for

- enclosing optical fiber connections (figure 5, column 1, lines 23-31 comprising: a housing (27) having an interior region;
- a bearing mount (41) disposed in the interior region of the housing;
- a cable spool engaged with the bearing mount such that the cable spool (11) selectively rotates within the housing (column 2, lines 41-47; and

- a termination module (47), disposed on the cable spool (11) so that the termination module rotates in unison with the cable spool (column 2, lines 53-54).

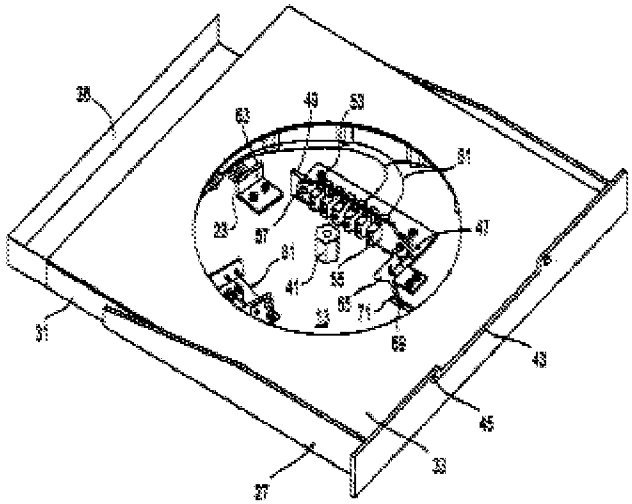


Fig. 5

Regarding claims 6 and 7, a slack storage area and a cable management spool (column 2, lines 14-22).

Regarding claims 10 and 13 , wherein connected a plurality of adapters (figures 5 and 55, column 2, lines 57 through column 3, line 5).

Regarding claims 16 and 17, fixing the spool with a pin (column 3, lines 25-33)

Rejections Under 35 USC 103

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

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

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Walters et al (USPNO. 6,220,413) in view of Scott et al (USPNO. 5,519,275).

Regarding claim 2, Walters et al does not explicitly teach a method of installing a rotating spool configuration including a bearing mount, as claimed in claim 2.

However, Scott is the evidence that an ordinary skill in the art would find a reason, suggestion or motivation to have the device, wherein a needle bearing is disposed on an outer surface of the bearing mount would implement as claimed in the

device. For details see column 13, lines 52-59. Since both references discloses a rotating components, It would have been obvious to one of ordinary skill in the art at the time the invention was made use such teachings of Scott et al in the device of Walters et al, since the resultant method would maintain affixed and predetermined gaps around the axis of rotation. For details see column 13, lines 58-59.

Claims 3-5, and 11 -12 rejected under 35 U.S.C. 103(a) as being unpatentable over Walters et al (USPNO. 6,220,413) in view of Gelfman (USPNO. 5,551,545).

Regarding claims 3 & 11, Walters et al does explicitly teach wherein the termination module includes an adapter plate having an adapter slot with a plurality of adapters engaged with the adapter slot, as claimed. However, such teachings are very elementary teachings in this art, as is mentioned by Gelfman columns 7-8).

Regarding claims 4 & 12, wherein the termination module includes a plurality of sliding adapter modules. For details see, columns 7-8 of Gelfman

Regarding claim 5, wherein an axial end of the cable spool defines a cable passage. For details see figure 1 of Gelfman.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use such teachings of Gelfman in the device of Walters et al, since the cable may carry electrical signals or power through metallic conductors or may comprise a fiber optic cable or a combination of both. For details see, column 3 of Gelfman.

Cited Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Puetz et al is cited to show a typical termination bay/frame in a fiber optic telecommunications industry. Hinds is cited to show a typical cable spool in a fiber optic cable

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Akm Enayet Ullah whose telephone number is (571)272-2361. The examiner can normally be reached on Monday through Wednesday from 6:30 am. till 5 pm.

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

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Akm Enayet Ullah/
Primary Examiner
Art Unit 2874

Notice of References Cited	Application/Control No. 12/182,705	Applicant(s)/Patent Under Reexamination KOWALCZYK ET AL.	
	Examiner Akm Enayet Ullah	Art Unit 2874	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,551,545	09-1996	Gelfman, Stanley	191/12.2A
*	B	US-6,220,413	04-2001	Walters et al.	191/12.4
*	C	US-6,554,221	04-2003	Hinds, Cecil R.	242/557
*	D	US-6,711,339	03-2004	Puetz et al.	385/135
*	E	US-2006/0210230	09-2006	Kline et al.	385/135
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

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

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

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12182705	KOWALCZYK ET AL.
	Examiner	**Art Unit**
	Akm E Ullah	2874

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

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

CLAIM		DATE								
Final	Original	06/17/2009								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
	9	✓								
	10	✓								
	11	✓								
	12	✓								
	13	✓								
	14	✓								
	15	✓								
	16	✓								
	17	✓								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12182705	KOWALCZYK ET AL.
	Examiner	Art Unit
	Akm E Ullah	2874

SEARCHED			
Class	Subclass	Date	Examiner
385	135-139	6-15-2009	AU

SEARCH NOTES		
Search Notes	Date	Examiner
EAST SEARCH HISTORY	6/11/2009	AU

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.U./

Date: FEBRUARY 18, 2009 Sheet 1 of 1

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 2316.2584USU2	Application Number: 12/182,705
	Applicant: KOWALCZYK ET AL.	
	Filing Date: 07/30/2008	Group Art Unit: 2874

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	7,346,253 B2	03/18/2008	Bloodworth et al.			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

23552
PATENT TRADEMARK OFFICE

EXAMINER	/Akm Ullah/	DATE CONSIDERED	06/15/2009

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.U./

Date: APRIL 17, 2009

Sheet 1 of 1

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 2316.2584USU2	Application Number: 12/182,705
	Applicant: KOWALCZYK ET AL.	
	Filing Date: 07/30/2008	Group Art Unit: 2874

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	3,920,308	11/18/1975	Murray			
	4,940,859	07/10/1990	Peterson			
	5,494,446	02/27/1996	DeLucia et al.			
	5,522,561	06/04/1996	Koyamatsu et al.			
	5,717,810	02/10/1998	Wheeler			
	2006/0210230 A1	09/21/2006	Kline et al.			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
	1 107 031 A1	06/13/2001	EP				

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

		International Search Report and Written Opinion mailed March 18, 2009

23552
PATENT TRADEMARK OFFICE

EXAMINER	/Akm Ullah/	DATE CONSIDERED	06/15/2009

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449)

Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.U./

Date: SEPTEMBER 5, 2008

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 2316.2584USU2	Application Number: 12/182,705
	Applicant: KOWALCZYK ET AL.	
	Filing Date: 07/30/2008	Group Art Unit: UNKNOWN

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	4,913,369	04/03/1990	Lia et al.			
	5,638,481	06/10/1997	Arnett			
	5,987,203	11/16/1999	Abel et al.			
	6,220,413 B1	04/24/2001	Walters et al.			
	2004/0170369 A1	09/02/2004	Pons			
	2005/0213920 A1	09/29/2005	Tanaka et al.			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
	42 26 368 A1	02/10/1994	DE			Abstract	
	9-236709	09/09/1997	JP			Abstract	
	11-349230	12/21/1999	JP			Abstract	
	2005-73365	03/17/2005	JP			Abstract	
	2005-249858	09/15/2005	JP			Abstract	

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

		International Search Report and Written Opinion mailed August 8, 2008

23552
PATENT TRADEMARK OFFICE

EXAMINER	/Akm Ullah/	DATE CONSIDERED	06/15/2009

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449)

Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.U./

Date: DECEMBER 17, 2008 Sheet 1 of 1

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 2316.2584USU2	Application Number: 12/182,705
	Applicant: KOWALCZYK ET AL.	
	Filing Date: 07/30/2008	Group Art Unit: UNKNOWN

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	2,727,703	12/20/1955	Bonnett			
	6,669,129 B1	12/30/2003	Shah			
	2006/0183362 A1	08/17/2006	Mullaney et al.			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

		International Search Report and Written Opinion mailed November 18, 2008

23552
PATENT TRADEMARK OFFICE

EXAMINER	/Akm Ullah/	DATE CONSIDERED	06/15/2009

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE

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

BIB DATA SHEET

CONFIRMATION NO. 4252

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
12/182,705	07/30/2008	385	2874	02316.2584USU2

APPLICANTS

Scott C. Kowalczyk, Savage, MN;
Jonathan Walter Coan, Savage, MN;
Jonathan R. Kaml, Shakopee, MN;

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

This appln claims benefit of 60/954,214 08/06/2007
and claims benefit of 61/029,248 02/15/2008

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

08/28/2008

Foreign Priority claimed	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
☐ Yes ☑ No	MN	14	17	2

35 USC 119(a-d) conditions met ☐ Yes ☑ No ☐ Met after Allowance

Verified and Acknowledged /AKM E ULLAH/ (Examiner's Signature) AU (Initials)

ADDRESS

MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903
UNITED STATES

TITLE

FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

FILING FEE RECEIVED		
1160	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

BIB (Rev. 05/07).

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	KOWALCZYK ET AL.	Examiner:	UNKNOWN
Serial No.:	12/182,705	Group Art Unit:	2874
Filed:	JULY 30, 2008	Docket No.:	2316.2584USU2
Title:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL		

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT (37 C.F.R. § 1.97(b))

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

23552
PATENT TRADEMARK OFFICE

Dear Sir:

With regard to the above-identified application, the items of information listed on the enclosed Form 1449 are brought to the attention of the Examiner. At least some of the references were recently cited in an International Search Report mailed March 18, 2009. Applicants note U.S. Patent No. 6,220,413 B1 listed in the Search Report was/were previously cited to or by the Examiner.

This statement should be considered because it is submitted before the mailing date of a first Office Action on-the-merits. Accordingly, no fee is due for consideration of the items listed on the enclosed Form 1449.

In accordance with 37 C.F.R. §1.98(a)(2), a copy of each foreign patent and/or a copy of each publication, other than U.S. patents and U.S. patent application publications, listed on the accompanying Form 1449 is enclosed.

No representation is made that a reference is "prior art" within the meaning of 35 U.S.C. §§ 102 and 103 and Applicants reserve the right, pursuant to 37 C.F.R. § 1.131 or otherwise, to establish that the reference(s) are not "prior art." Moreover, Applicants do not represent that a reference has been thoroughly reviewed or that any relevance of any portion of a reference is intended.

Consideration of the items listed is respectfully requested. Pursuant to the provisions of M.P.E.P. 609, it is requested that the Examiner return a copy of the attached Form 1449, marked

as being considered and initialed by the Examiner, to the undersigned with the next official communication.

Please charge any additional fees or credit any overpayment to Deposit Account No. 13-2725.

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, Minnesota 55402-0903
(612) 332-5300

Date: April 17, 2009

/David G. Schmaltz/
David G. Schmaltz
Reg. No. 39,828
DGS:PLSkaw

IPR2025-01119
Page 136 of 332
Belden EX1006

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 2316.2584USU2	Application Number: 12/182,705
	Applicant: KOWALCZYK ET AL.	
	Filing Date: 07/30/2008	Group Art Unit: 2874

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	3,920,308	11/18/1975	Murray			
	4,940,859	07/10/1990	Peterson			
	5,494,446	02/27/1996	DeLucia et al.			
	5,522,561	06/04/1996	Koyamatsu et al.			
	5,717,810	02/10/1998	Wheeler			
	2006/0210230 A1	09/21/2006	Kline et al.			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
	1 107 031 A1	06/13/2001	EP				

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

		International Search Report and Written Opinion mailed March 18, 2009

23552
PATENT TRADEMARK OFFICE

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449)

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 107 031 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
13.06.2001 Bulletin 2001/24

(51) Int Cl.[7]: **G02B 6/38**

(21) Application number: **00126631.1**

(22) Date of filing: **04.12.2000**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **07.12.1999 US 454853**

(71) Applicant: **MOLEX INCORPORATED**
Lisle Illinois 60532 (US)

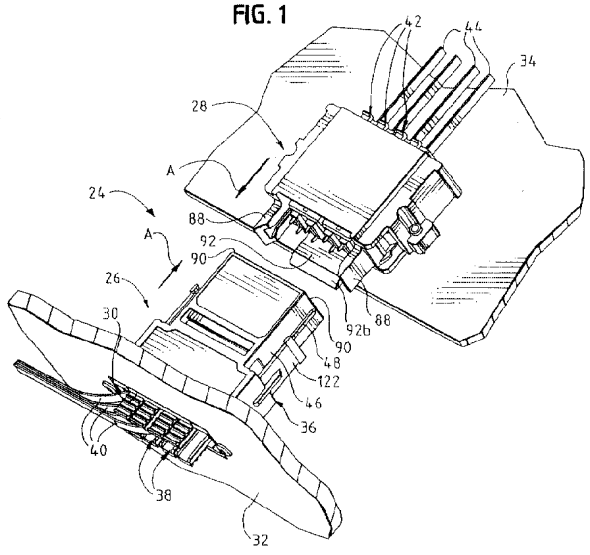
(72) Inventors:
- **Chen, Wenzong**
  Naperville, Illinois 60540 (US)
- **Grois, Igor**
  Northbrook, Illinois 60062 (US)
- **Matasek, Jeffrey A.**
  Cedarburg, Wisconsin 53012 (US)
- **Margolin, Mark**
  Highland Park, Illinois 60035 (US)

(74) Representative:
Blumbach, Kramer & Partner GbR
Patentanwälte,
Alexandrastrasse 5
65187 Wiesbaden (DE)

(54) Alignment system for mating connectors

(57) An alignment system is provided between a pair of connectors (36,28) mateable in a given mating direction (A). A first connector (36) includes a housing (46) having an alignment projection (48) on one side thereof. A second connector (28) includes a housing (72) having an alignment flange (88) projecting forwardly thereof generally in said mating direction. The alignment flange (88) is flared (88a) outwardly for engaging the housing (46) of the first connector (36) during mating and allowing a degree of misalignment between the connectors in an "X" direction generally perpendicular to the mating direction (A). The alignment flange (88) includes a slot (88b) for receiving the alignment projection (48) of the first connector. The slot has a flared mouth (88c) allowing a degree of misalignment between the connectors (36,28) in a "Y" direction generally perpendicular to the mating direction (A) and generally perpendicular to the "X" direction.

FIG. 1



EP 1 107 031 A1

Printed by Jouve, 75001 PARIS (FR)

IPR2025-01119
Belden EX1006

Description

Field of the Invention

[0001] This invention generally relates to the art of connector assemblies and. particularly, to an alignment system between a pair of mateable connectors.

Background of the Invention

[0002] Fiber optic connectors of a wide variety of designs have been employed to terminate optical fiber cables and to facilitate connection of the cables to other cables or other optical fiber transmission devices. A typical fiber optic connector includes a ferrule which mounts and centers an optical fiber or fibers within the connector. The ferrule may be fabricated of such material as ceramic. A ferrule holder or other housing component of the connector embraces the ferrule and may be fabricated of such material as molded plastic. A spring may be disposed within the housing or ferrule holder such that the ferrule is yieldably biased forwardly for engaging another fiber-mounting ferrule of a mating connecting device.

[0003] A pair of fiber optic connectors or a connector and another optical fiber transmission device often are mated in an adapter which centers the fibers to provide low insertion losses. The adapter couples the connectors together so that their encapsulated fibers connect end-to-end. The adapter may be an in-line component, or the adapter can be designed for mounting in an opening in a panel, backplane, circuit board or the like.

[0004] Various problems continue to be encountered in designing fiber optic connector assemblies or other connector assemblies, including applications involving backplanes, motherboards, daughterboards and the like. Such problems include properly and precisely placing a connector assembly on a substrate, such as a printed circuit board, accommodating misalignment of the connectors during mating, allowing relative floating movement between various components of the system and similar positional-type problems. Other problems simply involve efforts to simplify the design of connector assemblies. The present invention is directed to solving these problems and to providing various improvements in such connector assemblies.

Summary of the Invention

[0005] An object, therefore, of the invention is to provide a new and improved alignment system between a pair of connectors mateable in a given mating direction.

[0006] In the exemplary embodiment of the invention, a first connector includes a housing having an alignment projection on one side thereof extending generally transversely of the mating direction. A second connector includes a housing having an alignment flange projecting forwardly thereof generally in the mating direction. The alignment flange is flared outwardly generally transversely of the mating direction for engaging the housing of the first connector during mating and allowing a degree of misalignment between the connectors in an "X" direction generally perpendicular to the mating direction. The alignment flange further includes a slot for receiving the alignment projection of the first connector. The slot has a flared mouth allowing a degree of misalignment between the connectors in a "Y" direction generally perpendicular to the mating direction and generally perpendicular to the "X" direction. Therefore, the single flange of the second connector, in operative association with the alignment projection on the first connector, provides for a degree of misalignment in two different mutually transverse directions.

[0007] As disclosed herein, the alignment projection on the housing of the first connector is formed by a projecting rib which is elongated in the mating direction. The first connector comprises an open-ended adapter, with one open end for mating with the second connector. The second connector comprises a fiber optic connector.

[0008] In the preferred embodiment, a pair of the alignment flanges are provided on the housing of the second connector spaced transversely of the mating direction and between which the second connector is mated with the first connector. The transversely spaced flanges are formed by forwardly projecting arms having distal ends with inside surfaces which are divergingly flared away from the housing of the second connector. Each arm includes one of the slots in the inside thereof. Each slot has a flared mouth, and the housing of the first connector has one of the alignment projections on opposite sides thereof for receipt in the slots.

[0009] Other objects, features and advantages of the invention will be apparent from the following detailed description taken in connection with the accompanying drawings.

Brief Description of the Drawings

[0010] The features of this invention which are believed to be novel are set forth with particularity in the appended claims. The invention, together with its objects and the advantages thereof, may be best understood by reference to the following description taken in conjunction with the accompanying drawings, in which like reference numerals identify like elements in the figures and in which:

FIGURE 1 is a perspective view of a mating connector assembly embodying the concepts of the invention, with the assembly in unmated condition;
FIGURE 2 is a side elevational view of the mating connector assembly as shown in Figure 1;
FIGURE 3 is a perspective view of the mating connector assembly of Figure 1, in mated condition;
FIGURE 4 is an exploded perspective view of the backplane connector assembly as seen to the left

in Figures 1 and 2;
FIGURE 5 is a perspective view of one of the shutter assemblies for the adapter in the backplane connector assembly of Figure 4;
FIGURE 6 is a perspective view of the other shutter assembly for the adapter;
FIGURE 7 is an enlarged perspective view, broken away to show the floating mount between the adapter and the backplane in the backplane connector assembly of Figure 4;
FIGURE 8 is a perspective view of one of the fiber optic connector modules of the backplane connector assembly of Figure 4;
FIGURE 9 is a perspective view of the housing of the connector module of Figure 8;
FIGURE 10 is a perspective view showing the assembly procedure of the module of Figure 8;
FIGURE 11 is an exploded perspective view of the daughterboard connector assembly as seen to the right of Figures 1 and 2;
FIGURE 12 is an exploded bottom perspective view of the two-part housing of the daughterboard connector assembly;
FIGURE 13 is a perspective view of the front housing part of the daughterboard connector assembly;
FIGURE 14 is a perspective view of one of the fiber optic connector modules of the daughterboard connector assembly of Figure 11;
FIGURE 15 is an exploded perspective view of the module of Figure 14;
FIGURE 16 is a perspective view of the pin keeper of the module of Figure 14;
FIGURE 17 is a perspective view of the spring pusher member of the module of Figure 14;
FIGURE 18 is a perspective view showing the assembly of the coil spring to the pin keeper of Figure 16;
FIGURE 19 is a perspective view showing the assembly of the spring to the pusher member of Figure 17; and
FIGURES 20-22 are sequential top plan views, partially broken away, showing the mating of the mating connector assembly of Figures 1-3.

Detailed Description of the Preferred Embodiment

[0011] Referring to the drawings in greater detail, and first to Figures 1-3. the invention is embodied in a mating connector assembly, generally designated 24, which includes a backplane connector assembly, generally designated 26, mateable with a daughterboard connector assembly, generally designated 28. The backplane connector assembly is mounted in an aperture 30 in a substrate, panel or backplane which, in the preferred embodiment, is a printed circuit board. Specifically, backplane 32 can be considered the "motherboard" herein. The daughterboard connector assembly is mounted on a top surface of a second printed circuit board 34 which is considered the "daughterboard" herein.

[0012] Backplane connector assembly 26 includes an adapter, generally designated 36, which is mounted in aperture 30 in motherboard 32. Four fiber optic connector modules, generally designated 38, are inserted into adapter 36, through aperture 30, from the front of backplane 32. Each fiber optic connector module is terminated to a multi-fiber cable 40. Each cable is a flat or "ribbon" cable having a plurality of optical fibers.

[0013] After daughterboard connector assembly 28 is mounted on daughterboard 34, four fiber optic connector modules, generally designated 42, are inserted into the back of the connector housing, as described hereinafter. Each module 42 is terminated to a flat, multi-fiber cable 44 similar to fiber optic cables 40. Backplane connector assembly 26 and daughterboard connector assembly 28 are mateable in the direction of arrows "A" (Figs. 1 and 2) to a mated condition shown in Figure 3, wherein the fibers of cables 40 and 44 are functionally connected.

[0014] Referring to Figure 4, adapter 36 includes a housing 46 which may be fabricated of molded plastic material. The housing defines a front mating end 46a and a rear terminating end 46b. The front mating end is open, as at 46c, and through which the ferrules (described hereinafter) of fiber optic connector modules 38 can project. Terminating end 46b is open, as at 46d, for receiving connector modules 38 in the direction of arrows "B". Housing 46 of adapter 36 has an outwardly projecting alignment rib 48 on each opposite side thereof and extending in the mating direction of the connector assembly, for purposes described hereinafter.

[0015] Figure 5 shows a shutter assembly, generally designated 50, for closing opening 46b of adapter 46, and Figure 6 shows a shutter assembly, generally designated 52, for closing mating opening 46c of the adapter. Shutter assembly 50 includes a pair of spring-loaded shutters 50a which close opening 46d on opposite sides of an interior partition 54 (Fig. 4). The shutter members are pivotally mounted on a plate 50b which includes a plurality of pegs 50c which are press-fit into holes 56 in adapter housing 46. Similarly, shutter 52a of shutter assembly 52 is spring-loaded and is mounted on a plate 52b which has a plurality of pegs 52c which are press-fit into a plurality of holes 58 in adapter housing 46. Shutters 50a and 52a provide dust covers for the interior of adapter 36.

[0016] Referring to Figure 7 in conjunction with Figure 4, means are provided for mounting adapter 36 to backplane 32 in order to provide relative floating movement therebetween. Specifically, a pair of T-nuts, generally designated 60, are floatingly mounted to adapter 36 and receive a pair of rivets 62 insertable in the direction of arrows "C" through a pair of mounting holes 64 in the backplane. The rivets have enlarged head portions 62a which will engage the surface of the backplane. Mounting holes 64 are spaced on opposite sides of opening 30.

IPR2025-01119
Page 140 of 332 Belden EX1006

[0017] Still further, each T-nut 60 includes a shank portion 60a and an enlarged head 60b. A mounting flange, generally designed 66, is molded integrally with each opposite side of adapter housing 46. Each flange 66 includes an interior cavity 66a which receives head portion 60b of one of the T-nuts 60. A passage 66b extends through flange 66 toward backplane 32 in communication with cavity 66a for receiving shank portion 60a of the T-nut. The following parameters should be understood: (1) the dimensions of head portion 60b are smaller than cavity 66a so that the head portion can float within the cavity, (b) the cross dimensions of shank portion 60a are less than the dimensions of passage 66b so that the shank portion can float within the passage and (c) the length of shank portion 60a is greater than the thickness of a wall portion 67 of flange 66 below the head portion (i.e., the thickness indicated by double-headed arrow "D" (Fig. 7). Therefore, when rivet 62 tightens the T-nut onto surface 32a of backplane 32, the adapter does not become tightened to the backplane and is allowed to float relative thereto. Lastly, passage 66b has a restricted mouth, as at 66e, so that the T-nut can be snap-fit into flange 66 to mount the nut to adapter housing 46. It should be understood that rivet 62 equally could be a threaded fastener, such as a screw, for threadingly engaging the T-nut.

[0018] Figures 8-10 show one of the fiber optic connector modules 38 which are inserted into adapter 36 as described above. Specifically, each module 38 includes a ferrule 68 terminated to one of the multi-fiber cables 40 with ends 40a (Fig. 8) of the fibers exposed at a mating face 68a of the ferrule. The ferrule includes a pair of alignment holes 68b opening into mating face 68a. The ferrule is captured by a manually manipulatable housing, generally designated 70, which includes a front portion 70a which actually captures the ferrule, and a rear portion defined by a pair of laterally spaced arms 70b that are graspable between an operator's fingers. Figure 10 shows that ferrule 68 has a peripheral flange 68c. The front portion 70a of housing 70 includes a pair of forward latch hooks 70c on two opposite sides of the housing and a pair of flexible latch arms 70d on the other two opposite sides of the housing. As seen best in Figure 9, each latch arm 70d includes an inside chamfered latch hook 70e. Latch hooks 70c engage the front of flange 68c of the ferrule, and latch hooks 70e on latch arms 70d engage the rear edges of flange 68c to hold the ferrule encapsulated within front portion 70a of housing 70.

[0019] Still referring to Figures 8-10, manually graspable arms 70 include serrations 71 on the outsides thereof to facilitate manual grasping thereof. A latch block 70f projects outwardly from each arm for latching engagement within adapter 36. Each arm 70b also includes an interior channel 70g for guiding ferrule 68 into front portion 70a of the housing.

[0020] Figure 10 shows that ferrule 68 is insertable into housing 70 of connector module 38 in the direction of arrow "E". The ferrule moves within channels 70g of arms 70b and through an open rear end 70h of front portion 70a of the housing. The ferrule becomes latched in a position projecting out of an open front end 70i (Fig. 9) of the housing and is locked in the position shown in Figure 8, with the ferrule projecting forwardly of the manually manipulatable housing.

[0021] Figures 11-13 show daughterboard connector assembly 28 to include a two-part housing defined by a front housing part, generally designated 72, and a rear housing part, generally designated 74. The rear housing part is insertable into the front housing part in the direction of arrow "F" (Fig. 11). Rear housing part 74 has a flexible latch arm 74a with a latch hook 74b which latches behind a front latch shoulder 72a (Fig. 13) when the two housing parts are initially assembled. Figure 13 also shows a second latch shoulder 72b which is located rearwardly of latch shoulder 72a, for purposes described hereinafter. Each housing part 72 and 74 may be a one-piece structure unitarily molded of dielectric material such as plastic or the like.

[0022] Generally, a system is provided for mounting front housing part 72 of daughterboard connector assembly 28 on daughterboard 34 with considerable precision. Specifically, the daughterboard has a pre-placement hole 76 spaced between a pair of positioning holes 78 of as seen in Figure 11. A pair of rivets 80 are insertable through positioning holes 78. As best seen in Figure 12, a pre-positioning peg 82 projects downwardly from a bottom surface 72d of front housing part 72 for insertion into pre-placement hole 76 with substantially zero insertion forces. In other words, hole 76 is larger than peg 82. A pair of positioning pegs 84 project downwardly from surface 70d for insertion into positioning holes 78 in daughterboard 34 by a press-fit to precisely fix the housing on the substrate. Peg 82 is solid, but pegs 84 are hollow for receiving rivets 80 therethrough to solidly lock the front housing part to the daughterboard. Pre-placement peg 82 is longer than positioning pegs 84 so that it is easy for an operator to locate and insert pre-placement peg 82 into pre-placement hole 76. The housing then can be easily pivoted about peg 82 until positioning pegs 84 are aligned with positioning holes 78.

[0023] Still referring to Figure 12, positioning pegs 84 are provided with crushable ribs 84a on the exterior thereof and which are crushed or deformed when pegs 84 are press-fit into holes 78. Bottom surface 72d of front housing part 72 is recessed, as at 86, around each positioning peg 84. This recessed area is provided for receiving any plastic material, such as crushable ribs 84a, which might be shaved off of positioning pegs 84 when they are press-fit into positioning holes 78. This ensures that bottom surface 72d of front housing part 72 is mounted flush on the flat top surface of daughterboard 34.

[0024] Generally, an alignment system is provided between daughterboard connector assembly 28 and

IPR2025-01119
Page 141 of 332 Belden EX1006

adapter 36 of backplane connector assembly 26. More particularly, as best seen in Figures 11 and 12, front housing part 72 includes a pair of alignment flanges 88 at opposite sides of an open mating end 72e of the front housing part. Each flange has an outwardly chamfered or flared distal end 88a which is engageable by the front edges 90 (Fig.1) of adapter 36 upon mating of the two connector assemblies. In essence, flared distal ends 88a allow for a degree of misalignment between the connector assemblies in an "X" direction generally perpendicular to mating direction "A" (Fig. 1) of the connectors, the "X" direction being generally parallel to daughterboard 34. Alignment flanges 88 have grooves or slots 88b on the insides thereof for receiving alignment ribs 48 (Fig. 1) on opposite sides of adapter housing 46. Slots 88b have flared mouths 88c which are engageable by the distal ends of alignment ribs 48 to allow for a degree of misalignment between the two connector assemblies in a "Y" direction generally perpendicular to mating direction "A" as well as generally perpendicular to the aforesaid "X" direction and daughterboard 44. Therefore, alignment flanges 88, with the outwardly flared distal ends 88a thereof in combination with flared mouths 88c of slots 88b, are unique in utilizing a singular structure to allow for misalignment in two different "X" and "Y" directions.

[0025] Referring back to Figure 2 in conjunction with Figures 11 and 12, a bottom flange 92 projects forwardly of front housing part 72 flush with bottom surface 72d (Fig. 12) of the front housing part. The flange has a bottom hook portion 92a and a top chamfered portion 92b. The bottom hook portion overlaps an edge 94 of daughterboard 34. The top chamfered portion 92b is engageable by the front bottom edge of adapter housing 46 to prevent the bottom edge of the housing from "stubbing" the front edge of the daughterboard during mating of the connector assemblies.

[0026] Figures 14-19 show in greater detail one of the fiber optic connector modules 42 inserted into rear housing part 74 of daughterboard connector assembly 28. Specifically, each module 42 includes a ferrule 96 for terminating multi-fiber cable 44, with a resilient boot 98 providing strain-relief for the cable. The ferrule includes a pair of through holes or passages 96a (Fig. 15) for receiving a pair of alignment pins 100 fixed to a pin keeper 102 which abuts against the rear of ferrule 96 so that the distal ends of alignment pins 100 project forwardly of a front mating face 96b of ferrule 96. A coil spring 104 is fixed to a rear end of pin keeper 102 as described hereinafter, and a spring pusher member 106 is fixed to the rear end of the coil spring. Both pin keeper 102 and pusher member 106 may be fabricated of molded plastic material. An integral, flexible latch arm 107 projects outwardly from the pusher member for latching the fiber optic connector module within rear housing part 74 of daughterboard connector assembly 28. Figure 16 shows that pin keeper 102 has a receptacle 102a at a rear end thereof for receiving a front end of coil spring 104, along with a locking flange 102b for locking with a coil at the front end of the spring. Although not visible in Figure 16, one of the locking flanges 102b are disposed at each opposite side of receptacle 102a of pin keeper 102.

[0027] Similarly, Figure 17 shows pusher member 106 to have a front receptacle 106a at a front end thereof for receiving a rear end of coil spring 104. A locking flange 106b is disposed at each opposite side of receptacle 106a for locking with a coil at the rear end of the coil spring.

[0028] Figures 18 and 19 show the procedure for assembling coil spring 104 between pin keeper 102 and pusher member 106 and locking the coil spring to those components. It should be noted that coil spring 104 is oval in cross-configuration. A tool 110 has a generally oval shaft 112 for insertion in the direction of arrow "G" into oval coil spring 104. The tool then is rotated in the direction of arrow "H" to effectively rotate the coil spring and cause the front open end coil 104a to lock behind flanges 102b (Fig. 16) of pin keeper 102. This subassembly then is positioned as shown in Figure 19 so that the opposite open end coil 104b (Fig. 18) is aligned with locking flanges 106b of pusher member 106. Shaft 112 of tool 110 then is inserted in the direction of arrow "I" (Fig. 19) into a rectangular hole 114 in pin keeper 102 and into coil spring 104, and the tool rotated in the direction of arrow "J". This effectively locks the coil spring in position between the pin keeper and the pusher member. Alignment pins 100 then are fixed within slots 116 (Fig. 19) so that they extend from the pin keeper as seen in Figure 15. Boot 98 then is inserted into opening 114 of the pin keeper; ferrule 96 is positioned onto alignment pins 100; fiber optic cable 44 is inserted into and through the entire assembly in the direction of arrow "K" (Fig. 15); and the alignment pins and cable are epoxied within the ferrule so that an entire self-contained unit is formed as shown in Figure 14.

[0029] Finally, Figures 20-22 show the mating procedure of backplane connector assembly 26 and daughterboard connector assembly 28 in the direction of arrows "A", after the backplane assembly is mounted to backplane or motherboard 32 and after the daughterboard connector assembly is mounted to daughterboard 34. These depictions also show that fiber optic cables 40 are engaged with yet another substrate or board 120. Before proceeding, Figure 20 best shows that adapter 36 of backplane connector assembly 26 has a pair of actuator arms 122 spaced outwardly from opposite sides thereof. The distal ends of actuator arms 122 are formed with a latch hook 122a and a forwardly facing chamfer 122b.

[0030] Backplane connector assembly 26 and daughterboard connector assembly 28 are mateable in a two-step process represented by Figures 21 and 22. In the first step, hooks 122a of actuator arms 122 snap behind a pair of preliminary latch shoulders 124 (Figs. 1 and 20) of rear housing part 74 of daughterboard connector

IPR2025-01119
Page 142 of 332 Belden EX1006

assembly 28. Latch hooks 74b on the ends of latch arms 74a at opposite sides of the rear housing part already have latched behind latch shoulders 72a (Fig. 14) of front housing part 72. This prevents any rearward movement of any part of daughterboard connector assembly 28 in response to the preliminary latching of backplane connector assembly 26 thereto. Further movement of the connectors in the mating direction causes chamfers 122b at the distal ends of actuator arms 122 of adapter 36 to engage the chamfered distal ends of latch arms 74a of rear housing part 74 and move the latch arms out of engagement with latch shoulders 72a. Latch hooks 74b of latch arms 74a now are free to move between latch shoulders 72a and latch shoulders 72b of the front housing part to provide a degree of floating movement between the two housing parts in the "Z" or mating direction. In other words, there is no floating movement between the housing parts in the "Z" direction until full mating occurs with the backplane connector assembly.

[0031] It will be understood that the invention may be embodied in other specific forms without departing from the spirit or central characteristics thereof. The present examples and embodiments, therefore, are to be considered in all respects as illustrative and not restrictive, and the invention is not to be limited to the details given herein.

Claims

1. An alignment system between a pair of connectors (36,28) mateable in a given mating direction (A), comprising:

   a first connector (36) including a housing (46) having an alignment projection (48) on one side thereof extending generally transversely of said mating direction (A); and
   a second connector (28) including a housing (72) having an alignment flange (88) projecting forwardly thereof generally in said mating direction (A).
   said alignment flange (88) being flared (88a) outwardly generally transversely of said mating direction (A) for engaging the housing (46) of the first connector (36) during mating and allowing a degree of misalignment between the connectors (36,28) in an "X" direction generally perpendicular to the mating direction (A), and
   said alignment flange (88) including a slot (88b) for receiving the alignment projection (48) of the first connector (36), the slot having a flared mouth (88c) allowing a degree of misalignment between the connectors in a "Y" direction generally perpendicular to the mating direction (A) and generally perpendicular to said "X" direction.

2. The alignment system of claim 1 wherein said alignment projection on the housing of the first connector (36) comprises a projecting rib (48) which is elongated in said mating direction (A).

3. The alignment system of claim 1, including a pair of said alignment flanges (88) on the housing (72) of the second connector (28), the flanges being spaced transversely of said mating direction (A) and between which the second connector (28) is mated with the first connector (36).

4. The alignment system of claim 3 wherein said transversely spaced flanges comprise forwardly projecting arms (88) having distal ends with inside surfaces (88a) which are divergingly flared away from the housing (72) of the second connector (28).

5. The alignment system of claim 4 wherein each of said arms (88) includes one of said slots (88b) in the inside thereof, each slot having said flared mouth (88c), and the housing (46) of the first connector (36) having one of said alignment projections (48) on opposite sides thereof for receipt in said slots (88c).

6. The alignment system of claim 1 wherein said first connector comprises an open-ended adapter (36), with one open end (46c) for mating with the second connector (28).

7. The alignment system of claim 6 wherein said second connector comprises a fiber optic connector (28).

8. An alignment system between an adapter (36) and a fiber optic connector (28) mateable in a given mating direction (A), comprising:

   an adapter (36) including a housing (46) having an open end (46c) and an alignment projection (48) on one side thereof extending generally transversely of said mating direction (A); and
   a fiber optic connector (28) including a housing (72) having a pair of transversely spaced alignment arms (88) projecting forwardly thereof generally in said mating direction (A) and between which the adapter (36) is mated with the connector. the arms having distal ends (88a) which are divergingly flared away from the housing for allowing a degree of misalignment between the adapter and the connector in an "X" direction generally perpendicular to the mating direction (A), and
   said alignment arms (88) including slots (88b) forreceiving the alignment projections (48) of the adapter, the slots having flared mouths (88c) allowing a degree of misalignment be-

IPR2025-01119
Page 143 of 332 Belden EX1006

tween the adapter and the connector in a "Y" direction (A) generally perpendicular to the mating direction and generally perpendicular to said "X" direction.

9. The alignment system of claim 8 wherein said alignment projections on the housing (46) of the adapter (36) comprise projecting ribs (48) which are elongated in the mating direction (A).

10. A connector (28) for mounting on a surface of a substrate (34) at an edge (94) thereof, comprising a connector housing (72) adapted for mounting on the surface of the substrate with a mating end (72e) of the housing adjacent the edge (94) of the substrate (34), and a chamfered member (92) overlapping the edge of the substrate for guiding a complementary connecting device (36) into mating engagement with said mating end of the housing.

11. The connector of claim 1 wherein said chamfered member (92) is an integral part of the connector housing (72).

12. The connector of claim 11 wherein said connector housing (72) is molded of plastic material with the chamfered member (92) being molded integrally therewith.

IPR2025-01119
Belden EX1006
Page 144 of 332

FIG. 1

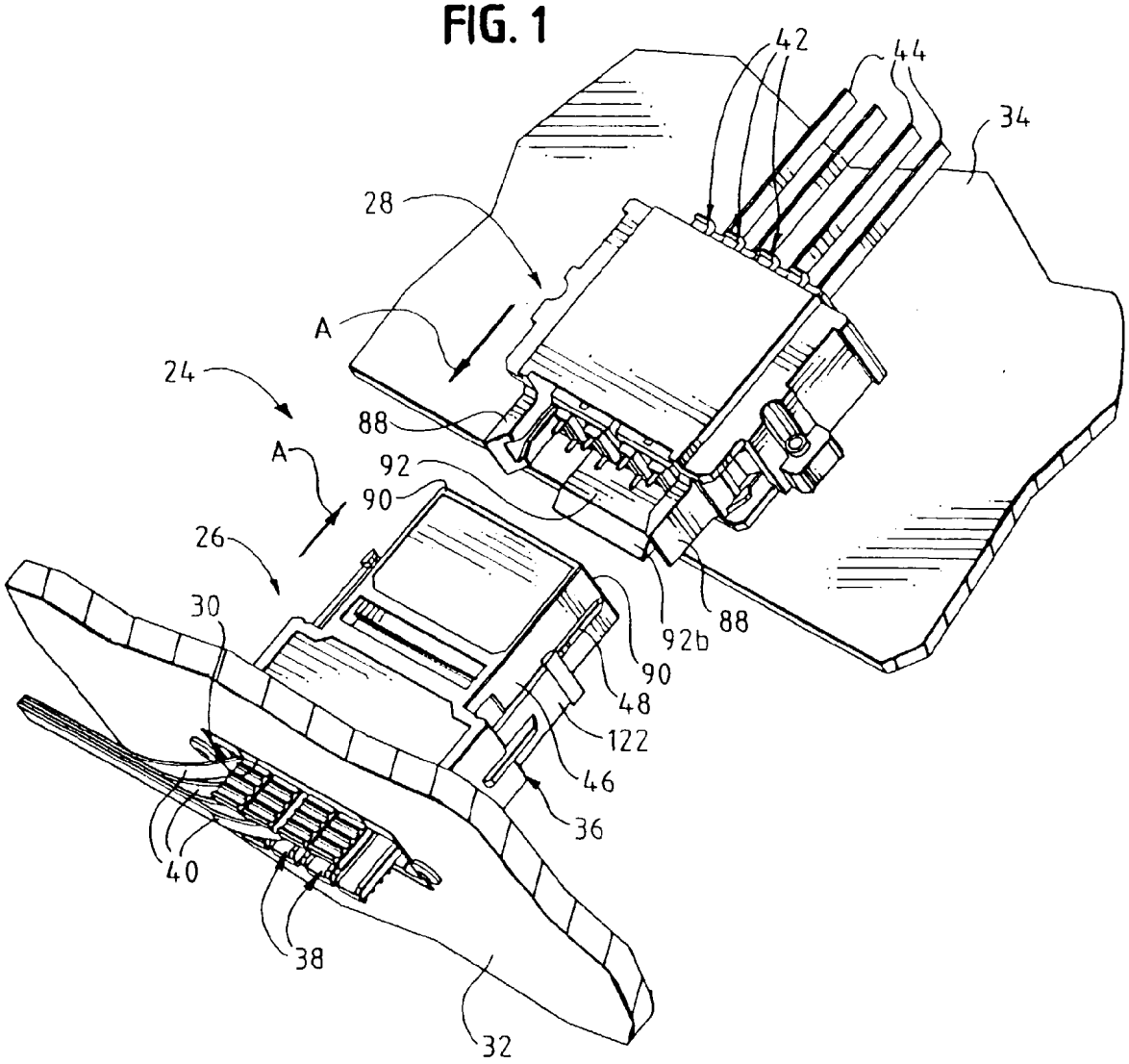


FIG. 2

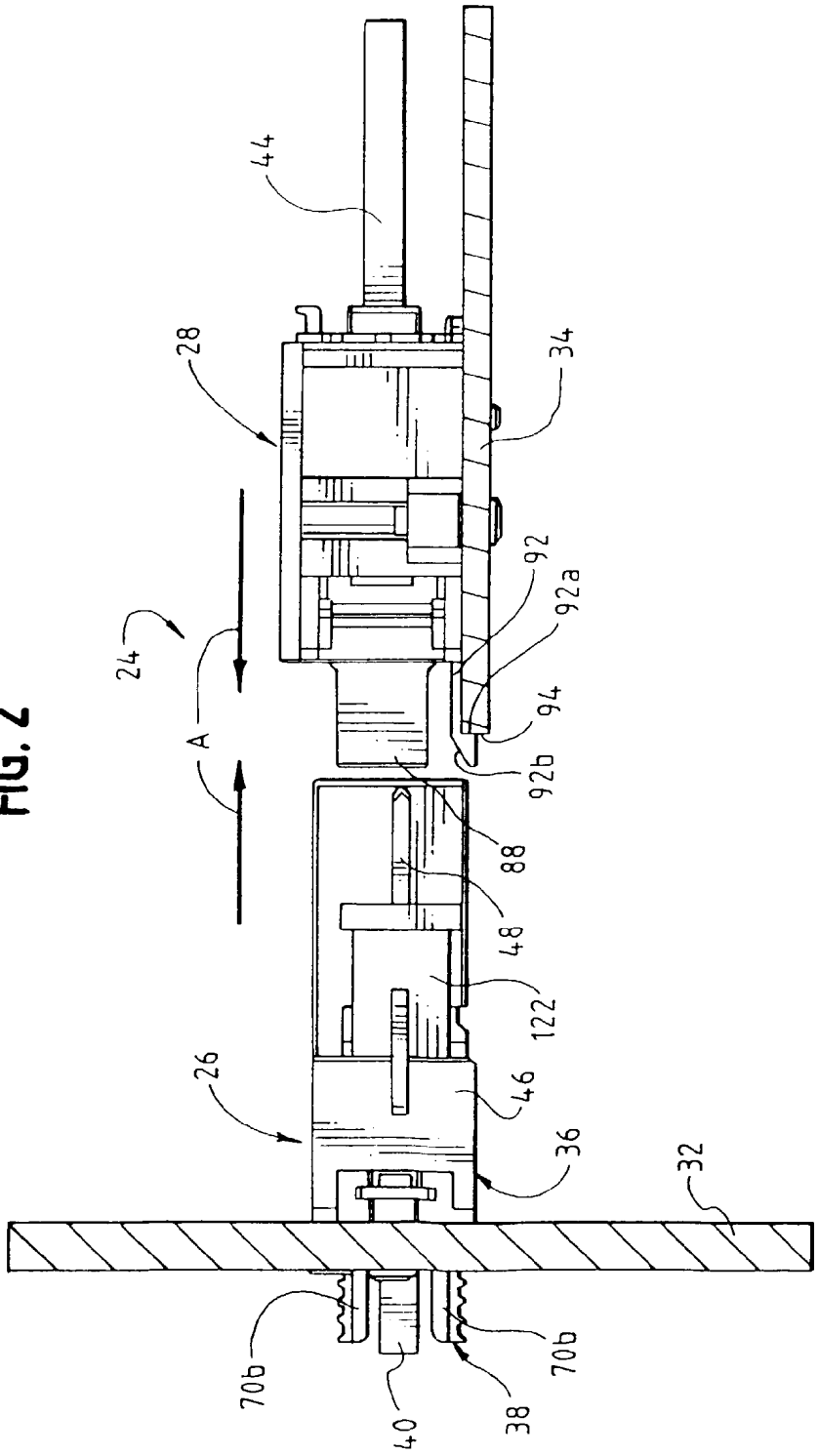
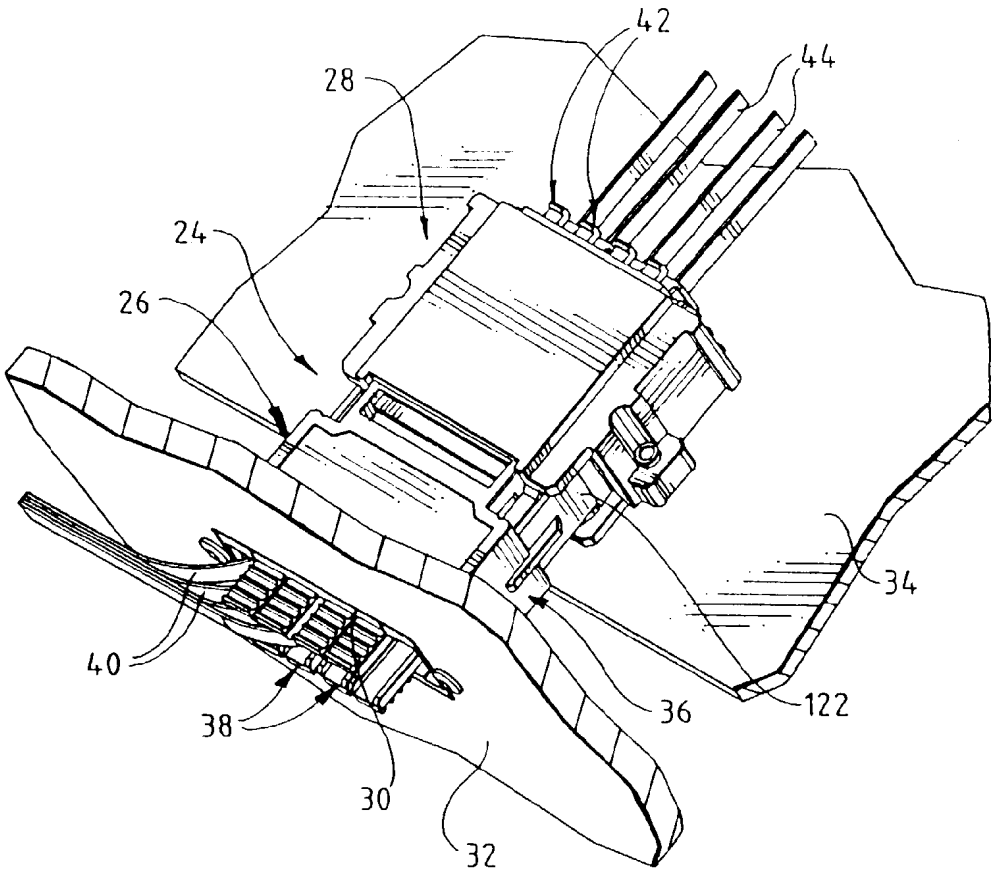


FIG. 3



IPR2025-01119
Page 147 of 332
Belden EX1006

FIG. 4

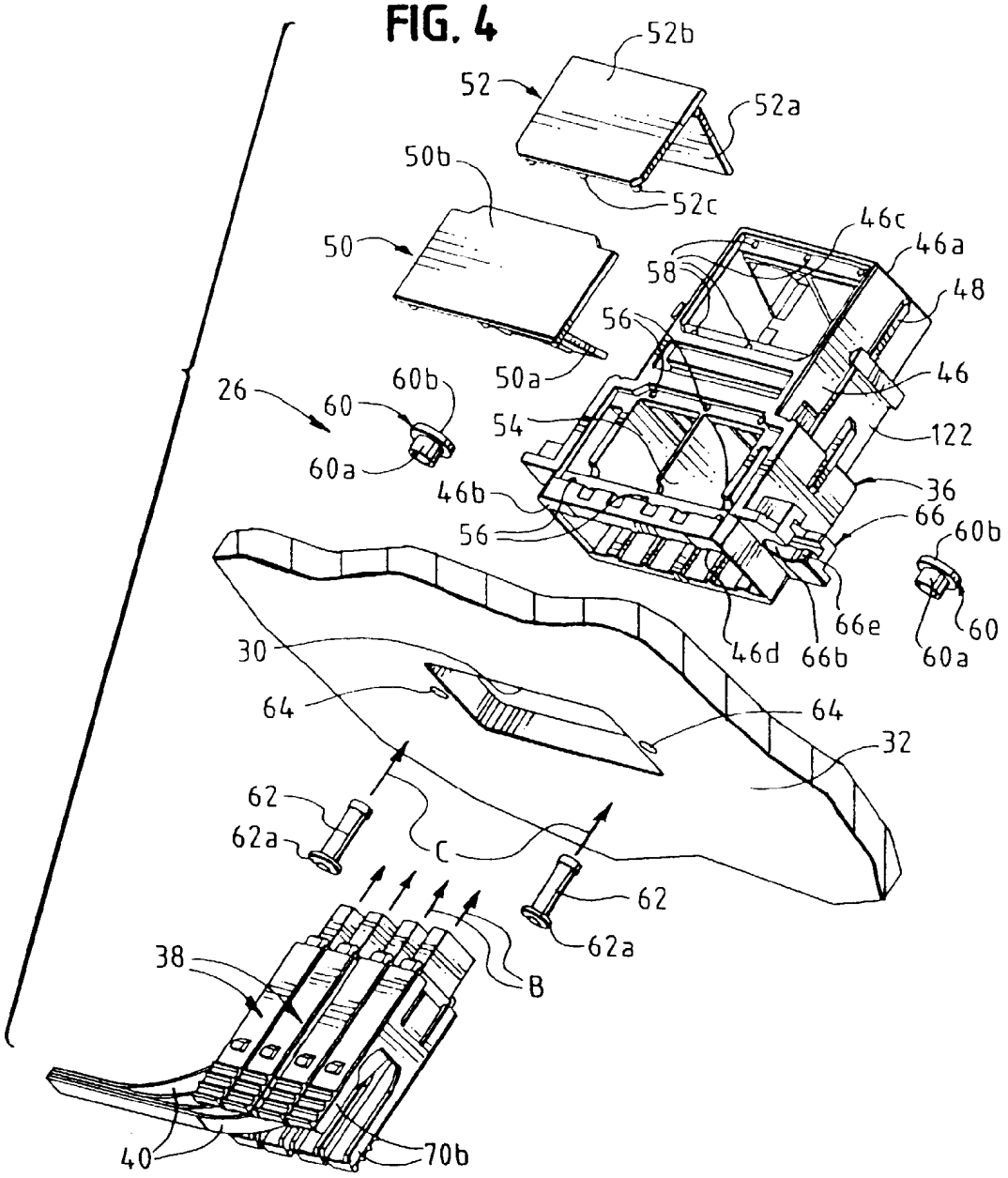

52b
52
52a
50b
52c
50
46c
46a
58
48
56
50a
46
26
60b
60
54
122
60a
46b
36
56
66
60b
30
46d
66b
66e
60
60a
64
64
32
62
62a
C
62
62a
38
B
40
70b

FIG. 5

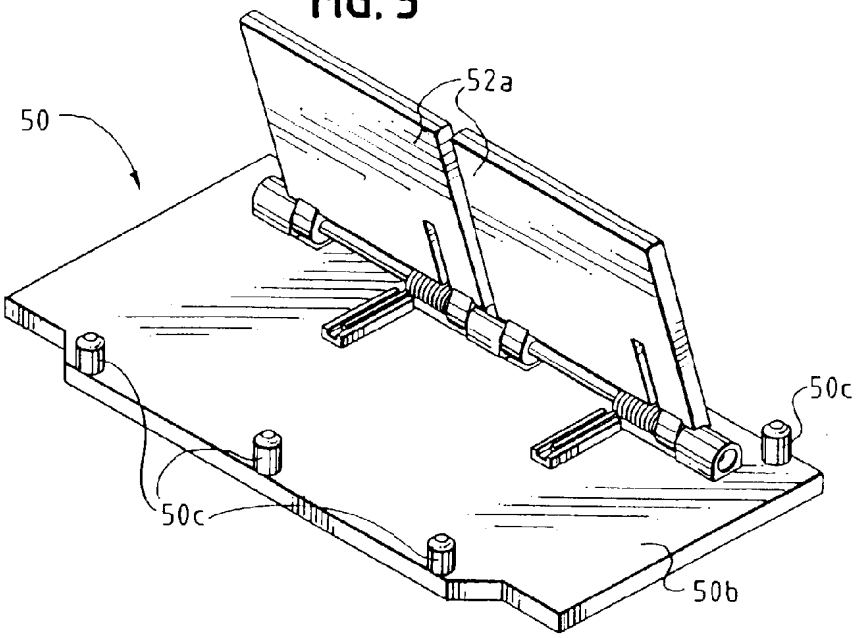


FIG. 6

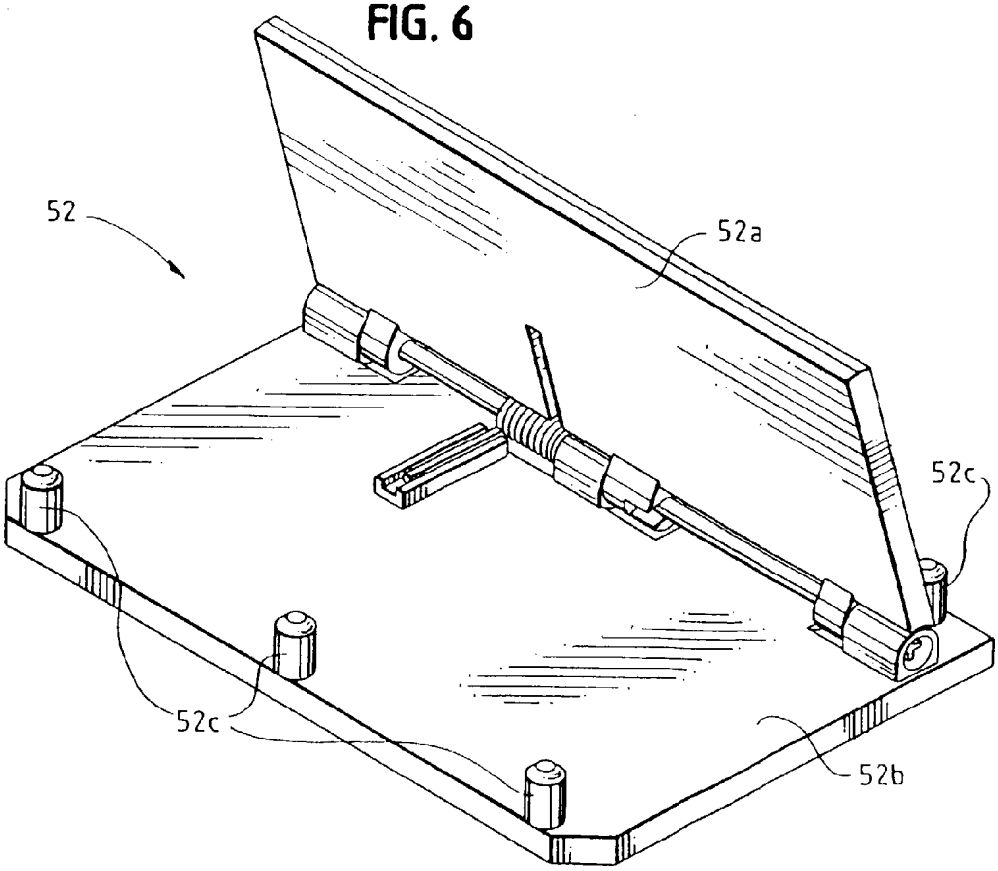


FIG. 7

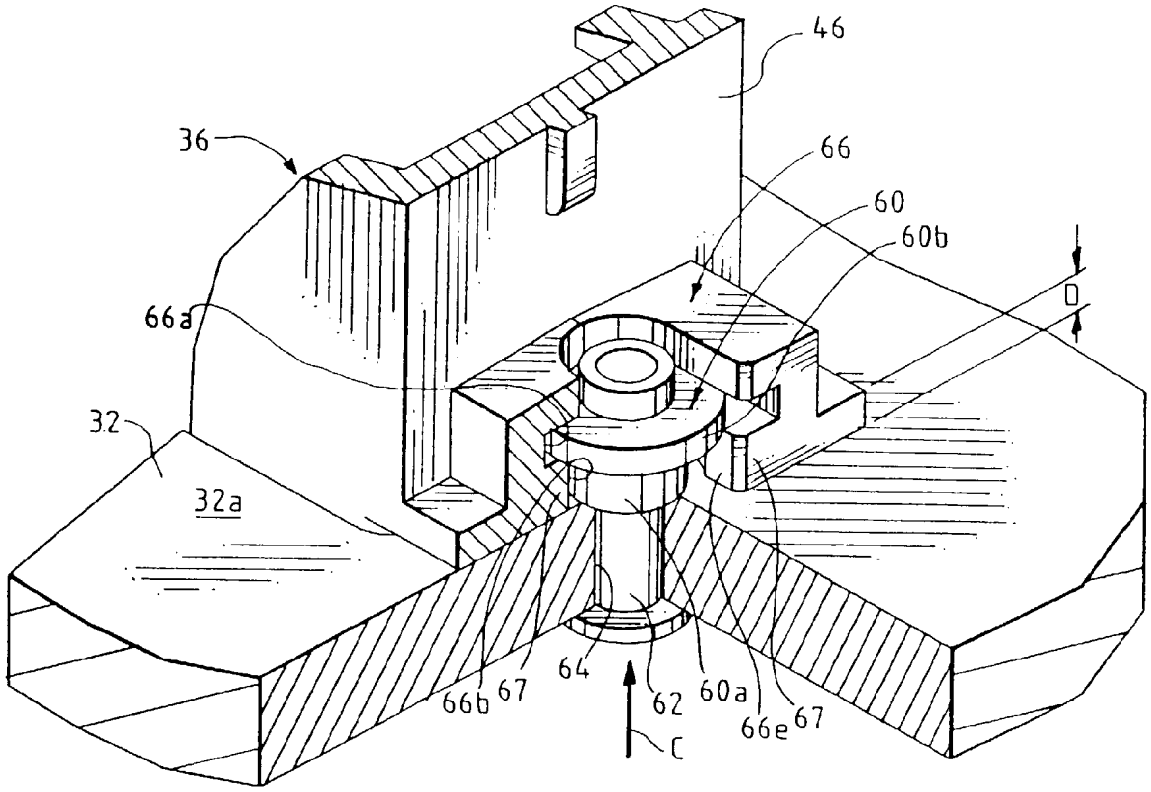
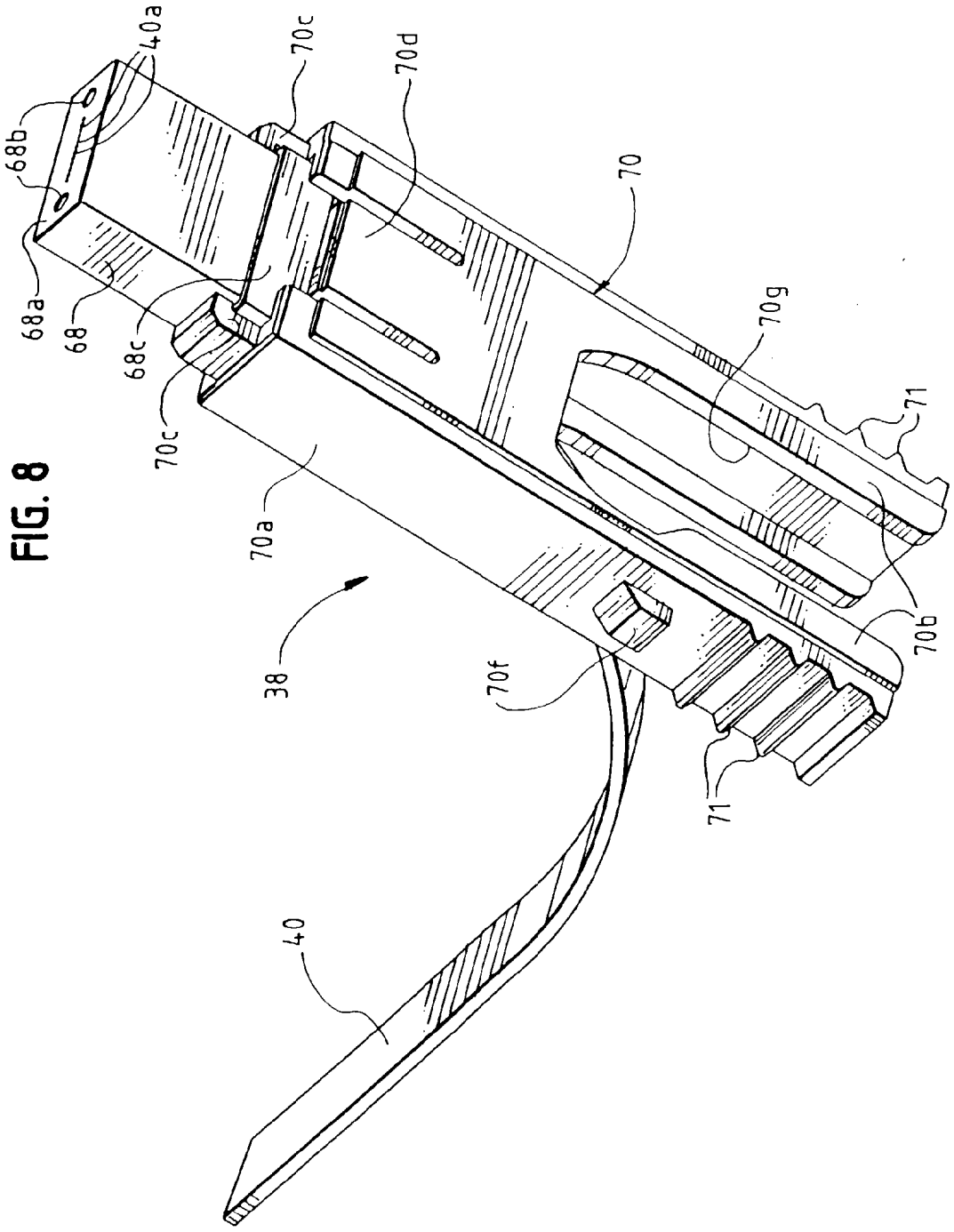


FIG. 8



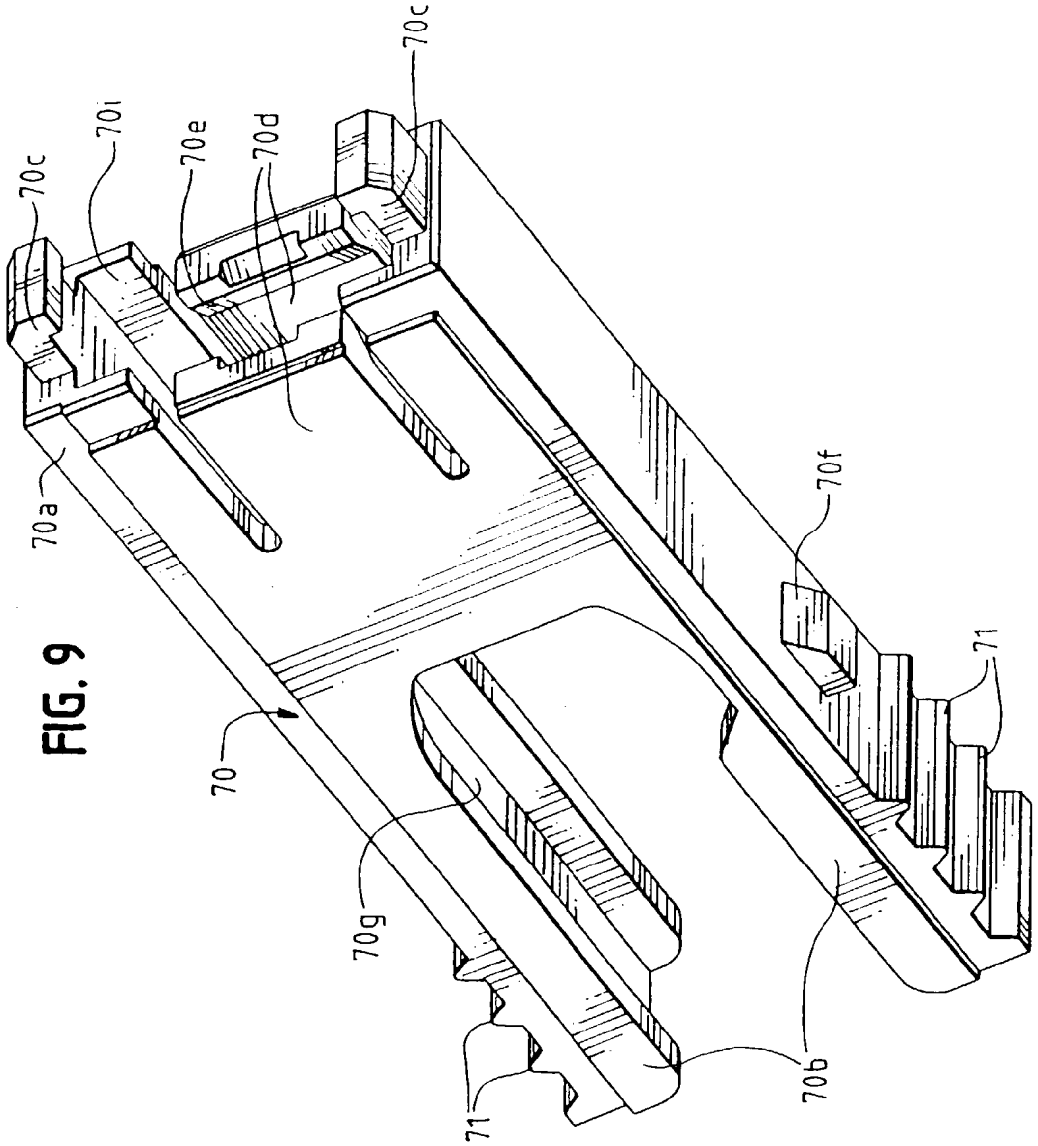


FIG. 9

FIG. 10

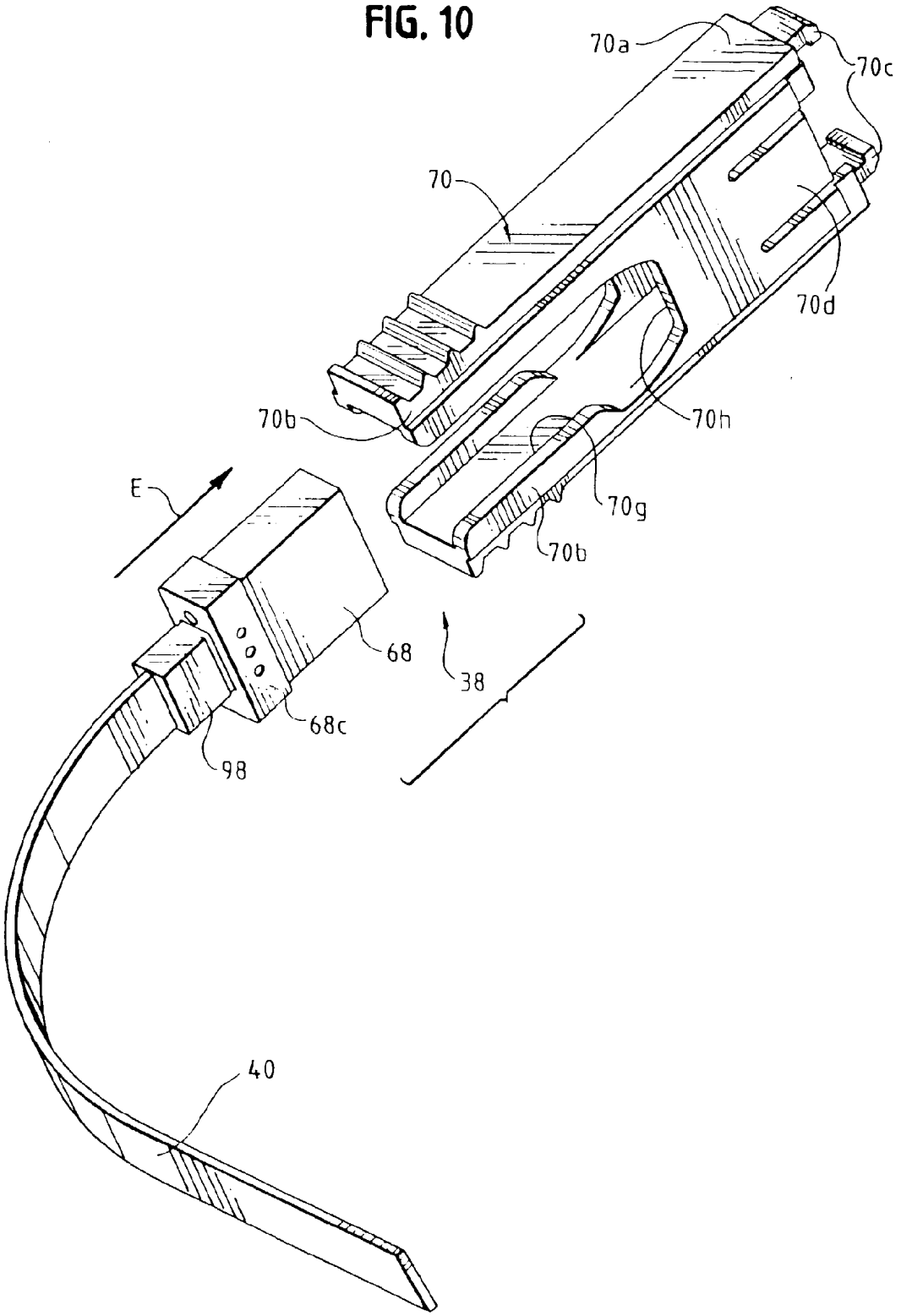


FIG. 11

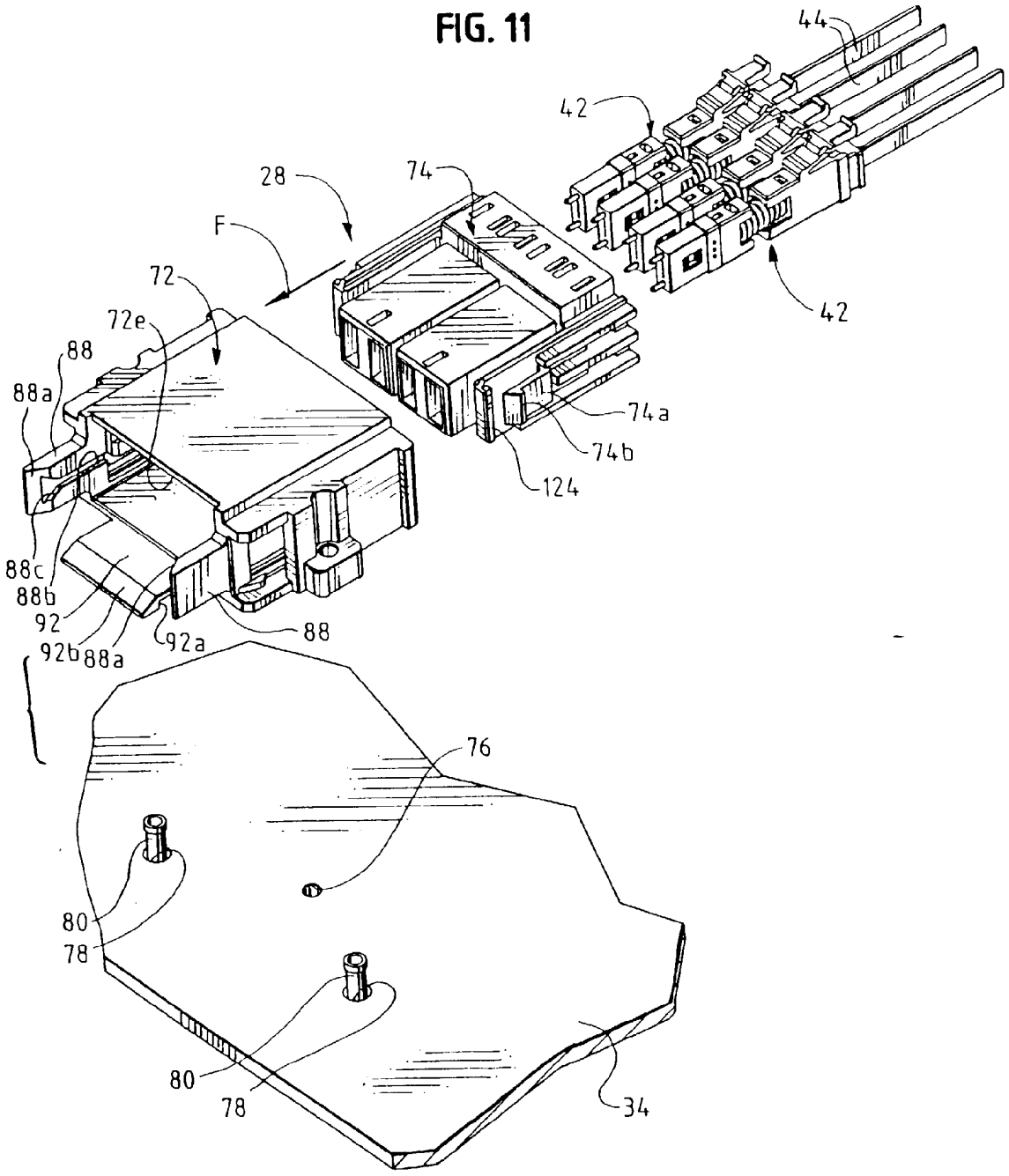

44
42
28
74
F
72
72e
88
88a
42
74a
74b
124
88c
88b
92
92b
88a
92a
88
76
80
78
80
78
34

FIG. 12

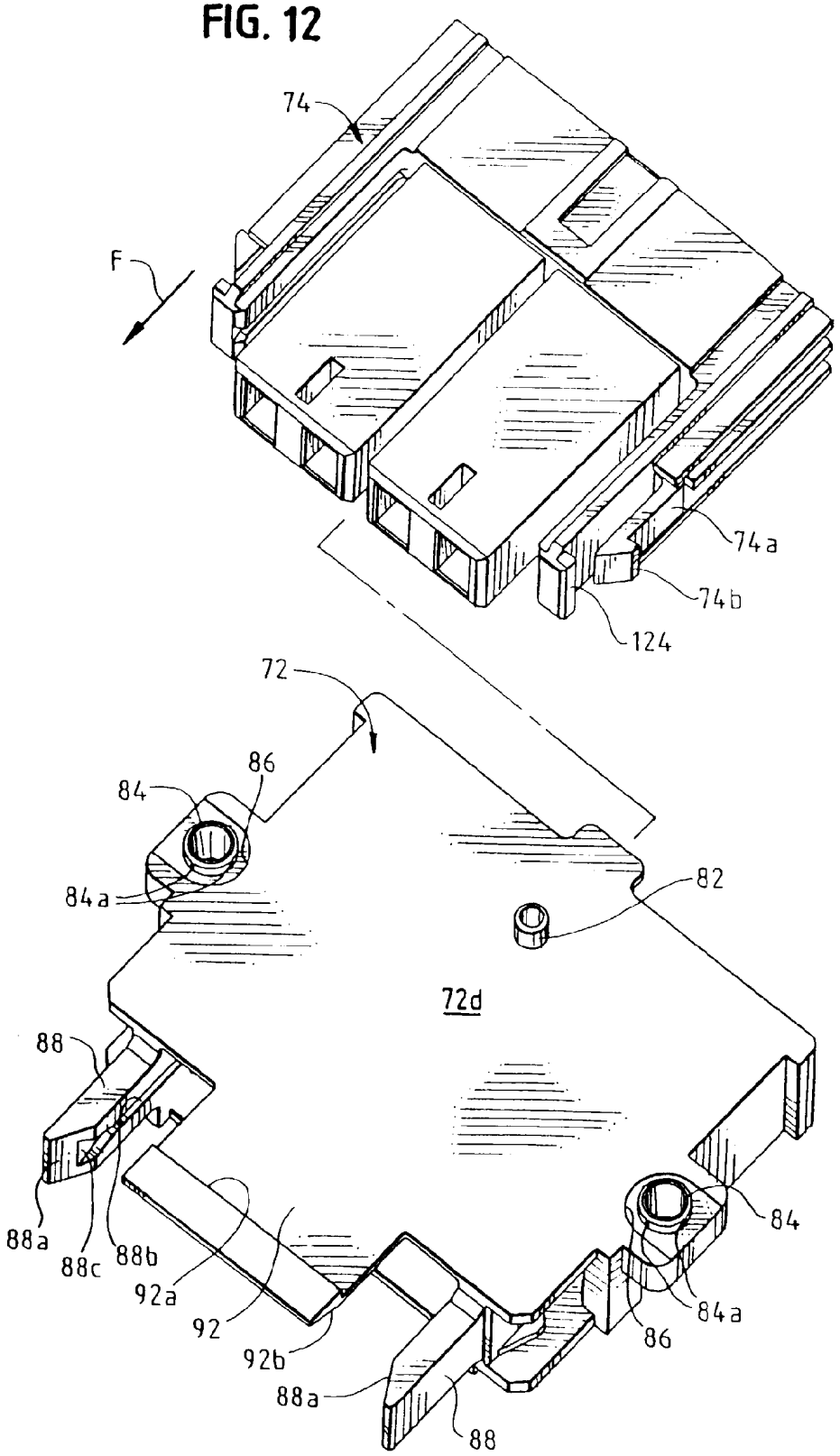

74
F
74a
74b
124
72
86
84
84a
82
72d
88
88a
88c
88b
92a
92
92b
88a
88
84
84a
86

FIG. 13

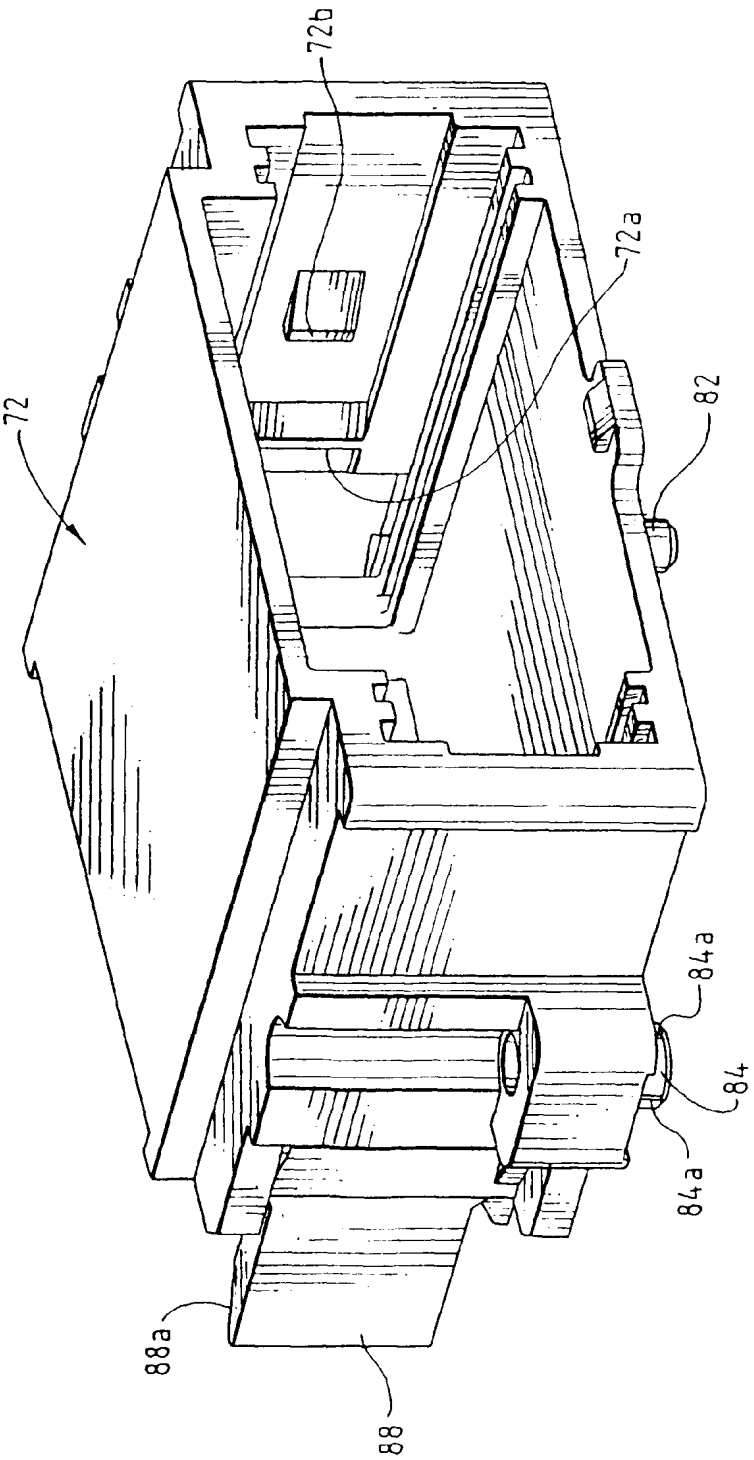


FIG. 14

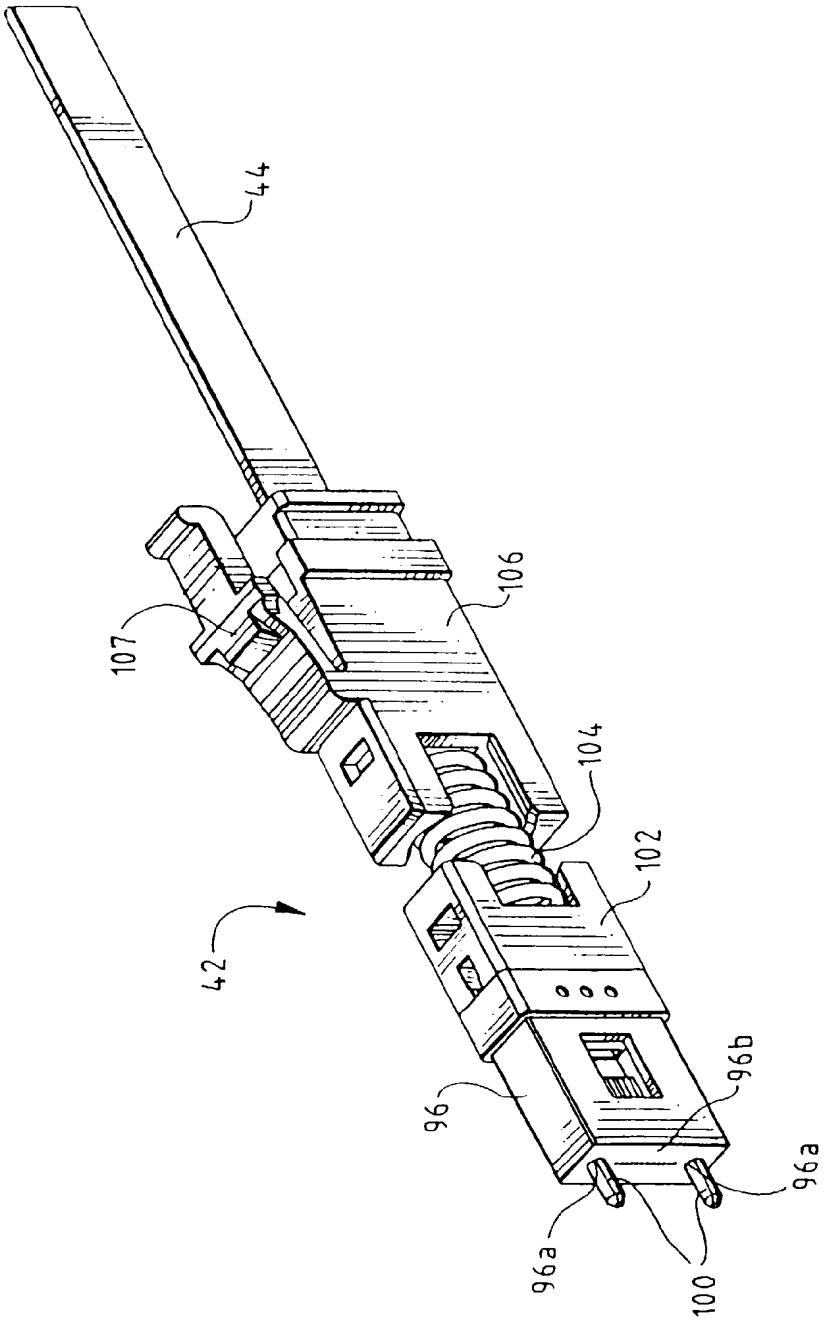


FIG. 15

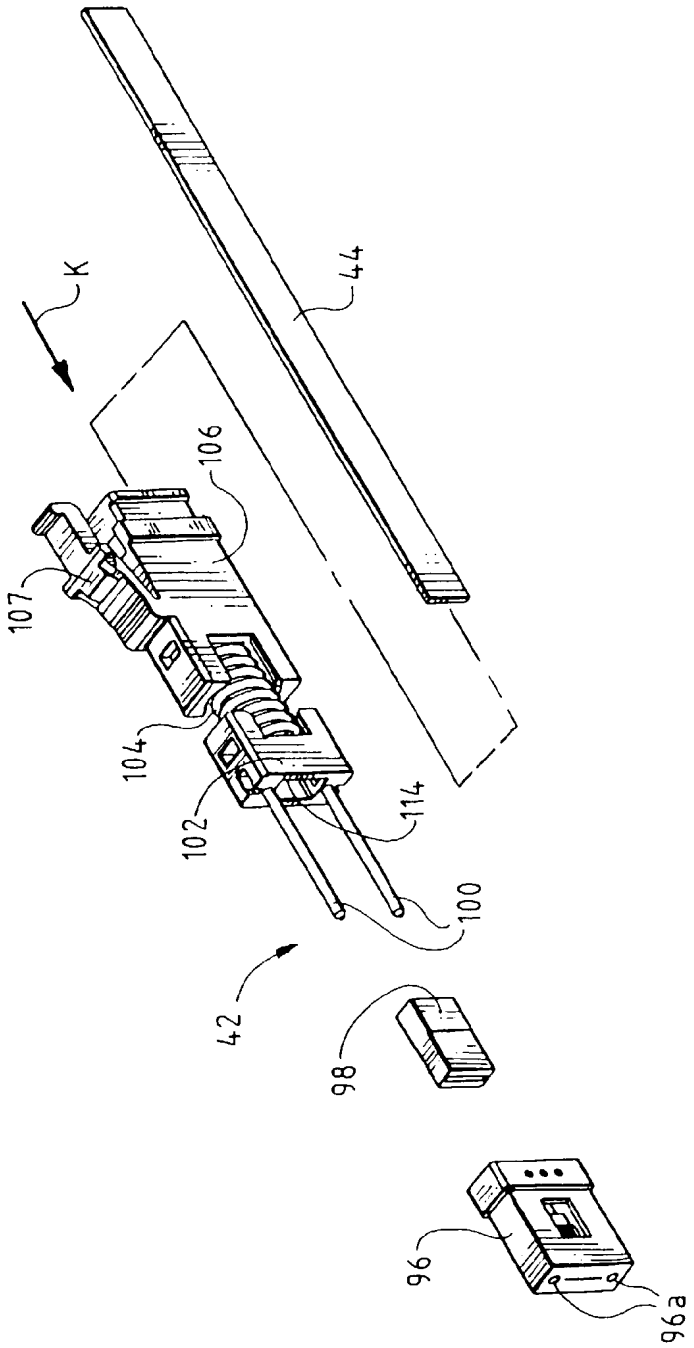


FIG. 16

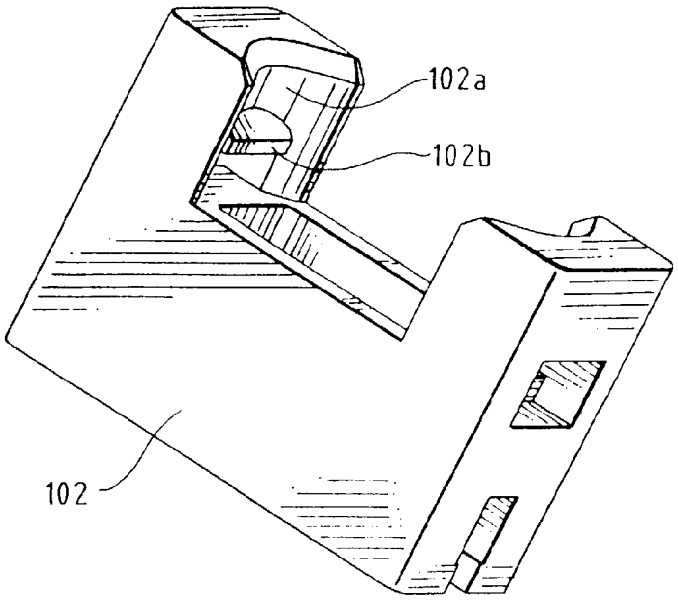
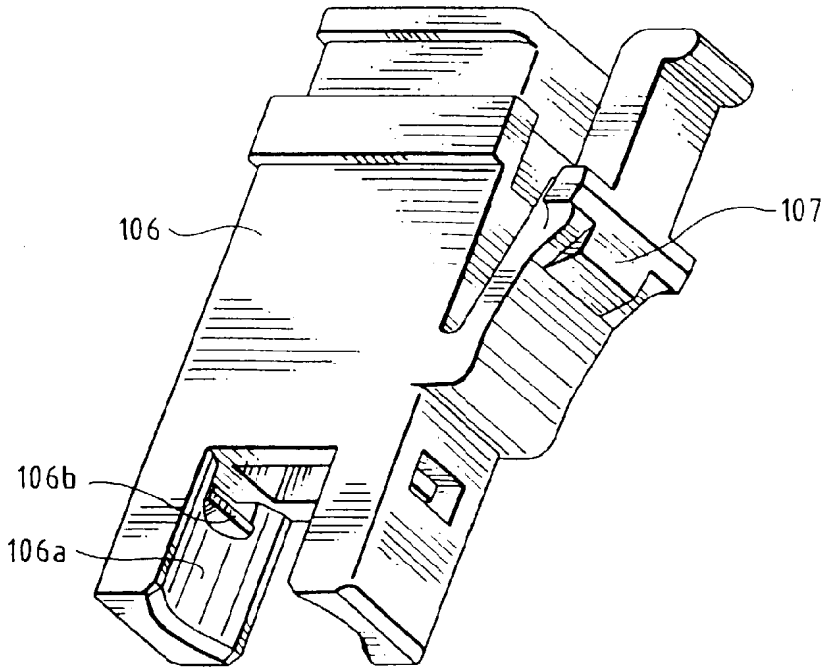


FIG. 17



IPR2025-01119
Page 159 of 332
Belden EX1006

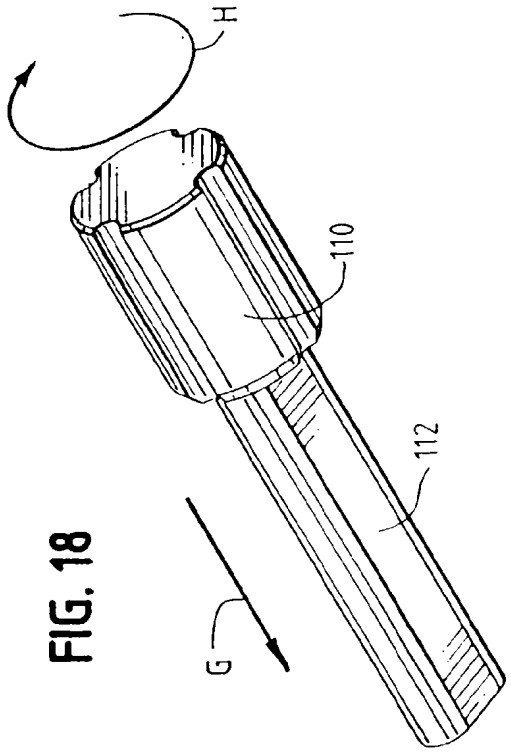


FIG. 18

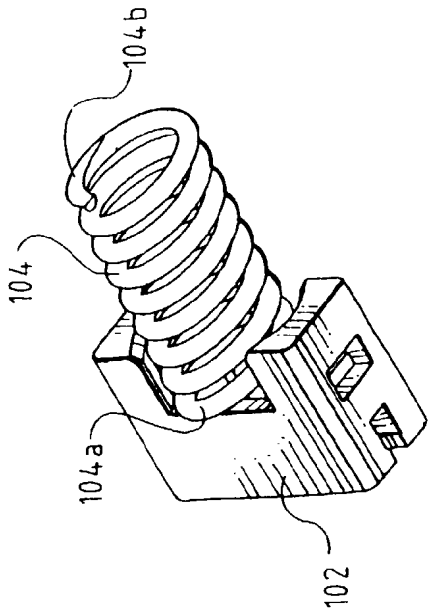
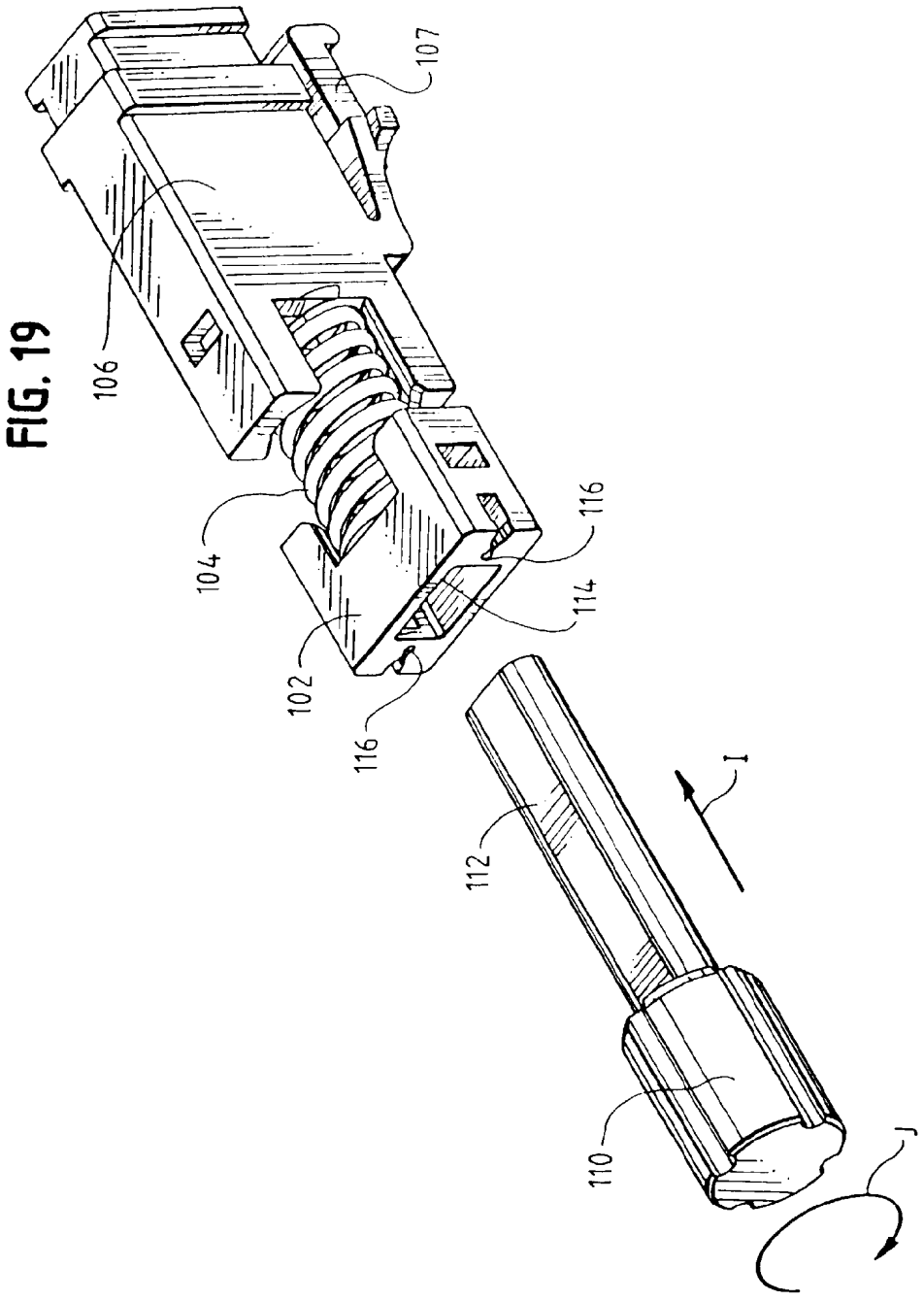


FIG. 19



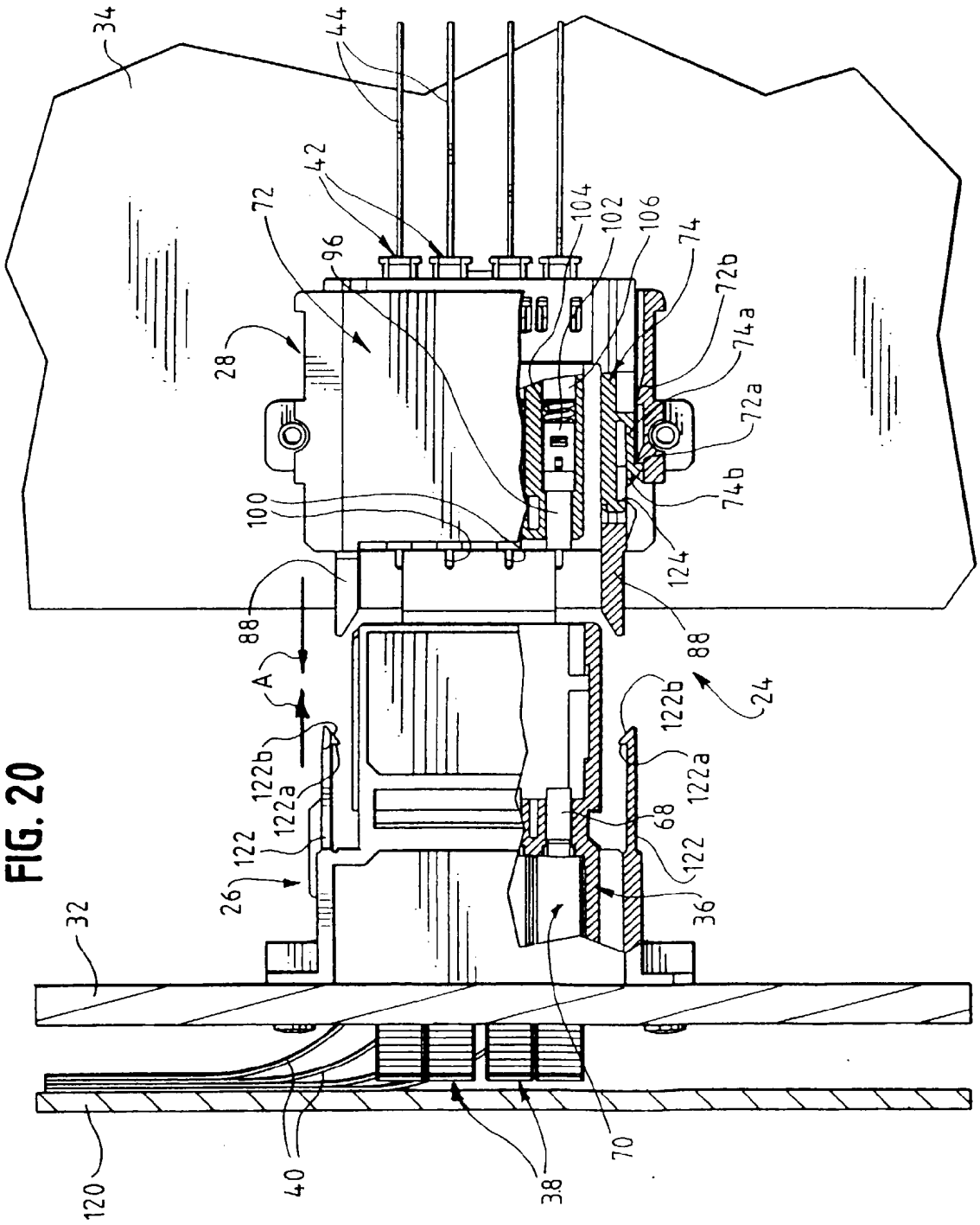
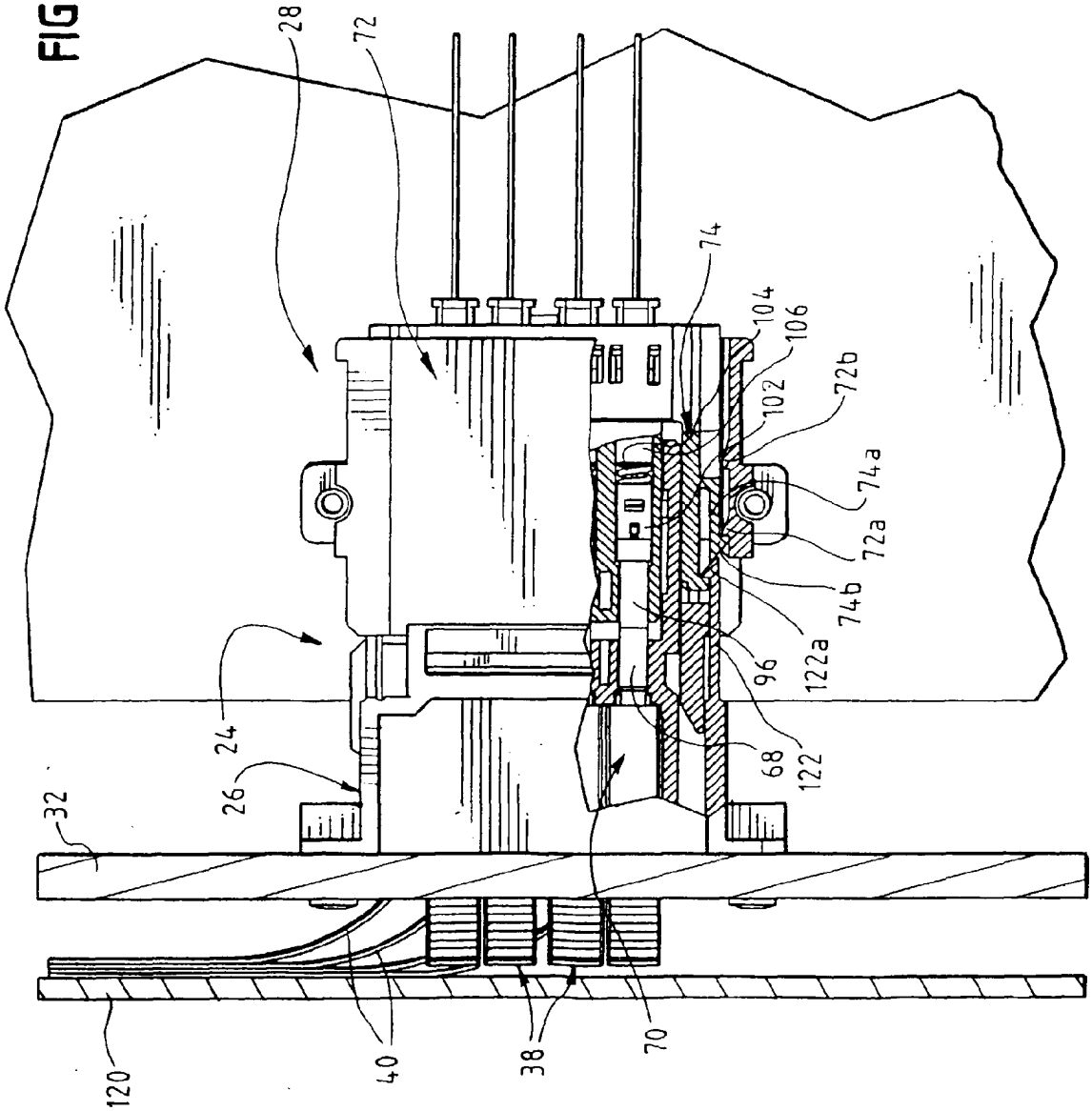

34
44
42
72
96
104
102
106
74
72b
74a
72a
28
100
74b
124
88
A
88
24
122b
122a
68
122
26
36
32
120
40
38
70

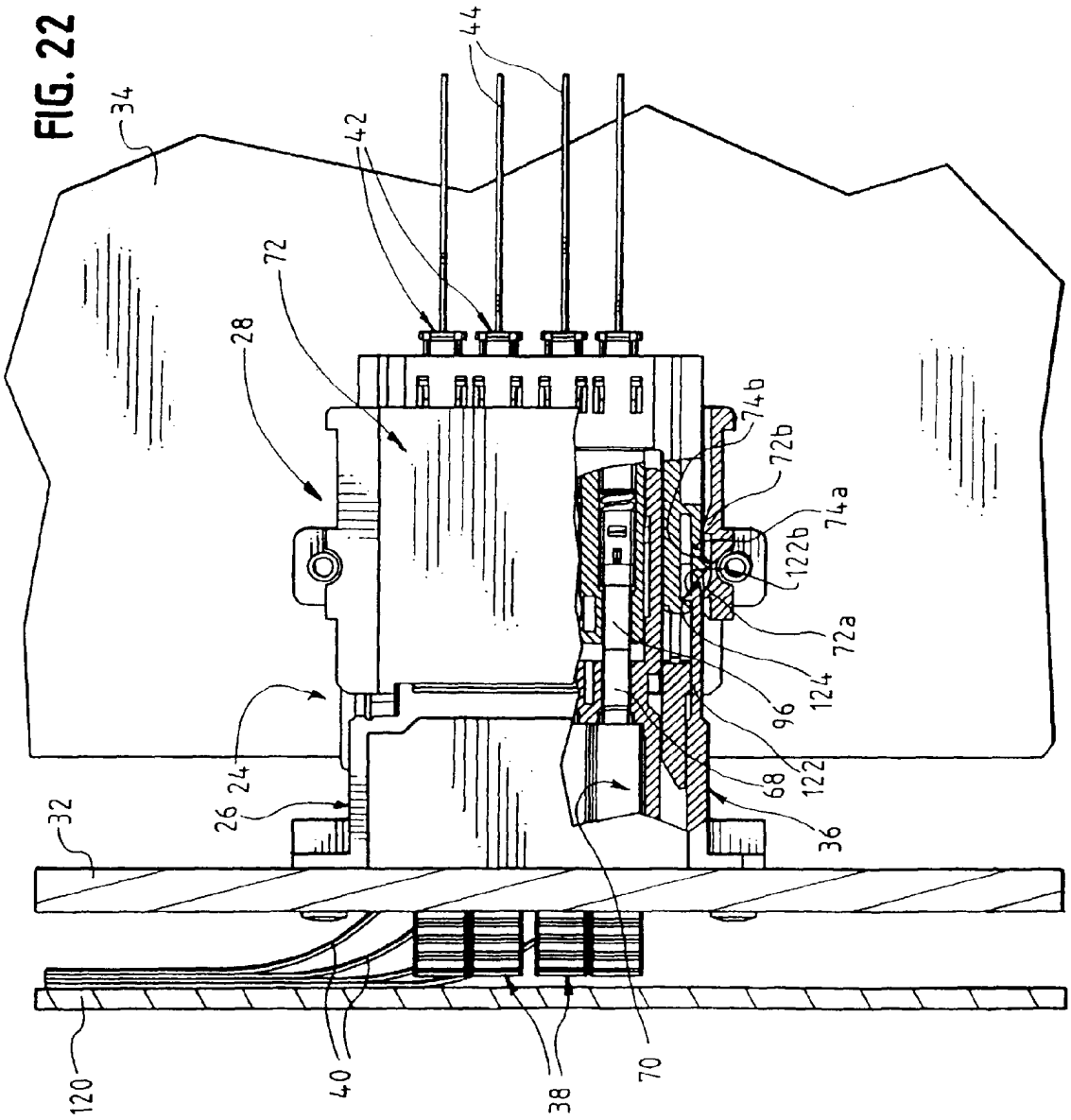
FIG. 20

FIG. 21



IPR2025-01119
Belden EX1006

FIG. 22


34
42
44
72
28
74b
72b
74a
122b
72a
124
96
68
122
36
24
26
32
120
40
38
70

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 12 6631

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 5 909 526 A (R.F.ROTH ET AL.) 1 June 1999 (1999-06-01) * abstract; figures 1-20 *	1,8	G02B6/38
A	US 4 611 887 A (D.W.GLOVER ET AL.) 16 September 1986 (1986-09-16) * abstract; figures 1-9 *	1,8	
A	WO 88 05925 A (AT&T) 11 August 1988 (1988-08-11) * abstract; figures 1-15 *	1,8	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

G02B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28 February 2001	Malic, K

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 12 6631

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

28-02-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5909526 A	01-06-1999	CN 1231429 A	13-10-1999
		EP 0949521 A	13-10-1999
		JP 3120375 B	25-12-2000
		JP 11326694 A	26-11-1999
		TW 386608 Y	01-04-2000
US 4611887 A	16-09-1986	NONE	
WO 8805925 A	11-08-1988	US 4787706 A	29-11-1988
		CA 1308280 A	06-10-1992
		DE 3884496 D	04-11-1993
		DE 3884496 T	27-01-1994
		EP 0300032 A	25-01-1989
		JP 6017926 B	09-03-1994
		JP 1502365 T	17-08-1989
		KR 9612188 B	16-09-1996

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

SBD

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
MERCHANT & GOULD P.C.
Attn. Schmaltz, David G.
P.O. Box 2903
MINNEAPOLIS, MINNESOTA 55402-0903
ETATS-UNIS D'AMERIQUE

DGS 02316.2584US1+US2+US3
ATY IDS US/PTA: April 17, 2009
ATY IDS US: June 18, 2009

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

ATY RESP SR/WO: May 18, 2009 D1 JP

(PCT Rule 44.1)

Applicant's or agent's file reference 2316.2584WOU2 ✓	Date of mailing *(day/month/year)* 18/03/2009
	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/US2008/072218	International filing date *(day/month/year)* 05/08/2008
Applicant ADC TELECOMMUNICATIONS, INC.	DEMAND DUE: June 18, 2009 JP

1. [x] The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the International Search Report.

   Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Fascimile No.: (41–22) 338.82.70

   For more detailed instructions, see the notes on the accompanying sheet.

2. [ ] The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. [ ] **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   [ ] the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

   [ ] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90*bis*.1 and 90*bis*.3, respectively, before the completion of the technical preparations for international publication.

   The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

   In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

   See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the International Searching Authority	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL–2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Cornelia Schulze

Form PCT/ISA/220 (October 2005)

(See notes on accompanying sheet)

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report and the written opinion of the International Searching Authority, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims,description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only (see *PCT Applicant's Guide*, Volume I/A, Annexes B1 and B2).

The attention of the applicant is drawn to the fact that amendments to the claims under Article 19 are not allowed where the International Searching Authority has declared, under Article 17(2), that no international search report would be established (see *PCT Applicant's Guide*, Volume I/A, paragraph 296).

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped),whether

(i) the claim is unchanged;

(ii) the claim is cancelled;

(iii) the claim is new;

(iv) the claim replaces one or more claims as filed;

(v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."

2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."

3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."

4. [Where various kinds of amendments are made]:
"Claims 1–10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

If a demand for international preliminary examination is made, the written opinion of the International Searching Authority will, except in certain cases where the International Preliminary Examining Authority did not act as International Searching Authority and where it has notified the International Bureau under Rule 66.1*bis*(b), be considered to be a written opinion of the International Preliminary Examining Authority. If a demand is made, the applicant may submit to the International Preliminary Examining Authority a reply to the written opinion together, where appropriate, with amendments before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later (Rule 43*bis*.1(c)).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see the *PCT Applicant's Guide,* Volume II.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44) SUBMIT COMMENTS: April 18, 2009

Applicant's or agent's file reference	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
2316.2584WOU2		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2008/072218	05/08/2008	06/08/2007
Applicant		
ADC TELECOMMUNICATIONS, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the **language,** the international search was carried out on the basis of:
      [X] the international application in the language in which it was filed
      [ ] a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
   b. [ ] This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).
   c. [ ] With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. [ ] **Certain claims were found unsearchable** (See Box No. II)

3. [ ] **Unity of invention is lacking** (see Box No III)

4. With regard to the **title,**
   [X] the text is approved as submitted by the applicant
   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**
   [ ] the text is approved as submitted by the applicant
   [X] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

DV

6. With regard to the **drawings,**
   a. the figure of the **drawings** to be published with the abstract is Figure No. 5
      [ ] as suggested by the applicant
      [X] as selected by this Authority, because the applicant failed to suggest a figure
      [ ] as selected by this Authority, because this figure better characterizes the invention
   b. [ ] none of the figures is to be published with the abstract

Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)

A fiber optic enclosure (21) assembly includes a housing (23) having an interior region (33) and a bearing mount (71) disposed in the interior region (33) of the housing (23). A cable spool (37) is connectedly engaged with the bearing mount (71) such that the cable spool (37) selectively rotates within the housing (23). A termination module (45) disposed on the cable spool (37) so that the termination module (45) rotates in unison with the cable spool (37). A method of paying out a fiber optic cable from a fiber optic enclosure (21) includes rotating a cable spool (37), which has a subscriber cable (22) coiled around a spooling portion of the cable spool (37), about an axis of a housing (23) of the fiber optic enclosure (21) until a desired length of subscriber cable (22) is paid out. A termination module (45) is disposed on the cable spool (37).

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2008/072218

A. CLASSIFICATION OF SUBJECT MATTER
INV. G02B6/44

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G02B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 220 413 B1 (WALTERS MARK D [US] ET AL) 24 April 2001 (2001-04-24) the whole document	1,6-10, 13,14, 16,17
X	US 2006/210230 A1 (KLINE JAMES R [US] ET AL) 21 September 2006 (2006-09-21) figure 5 paragraphs [0006], [0033]	1,8,15
A	EP 1 107 031 A (MOLEX INC [US]) 13 June 2001 (2001-06-13) paragraph [0021] figures 1,11-13	1,3,8,11
A	US 5 717 810 A (WHEELER TODD A [US]) 10 February 1998 (1998-02-10) figure 18	1,4,8,12

-/--

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 March 2009	18/03/2009

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Verdrager, Véronique

2

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2008/072218

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 522 561 A (KOYAMATSU ANTHONY H [US] ET AL) 4 June 1996 (1996-06-04) figure 8 column 6, lines 31-37	1,5

2

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2008/072218

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6220413 B1	24-04-2001	US 2001019002 A1	06-09-2001
US 2006210230 A1	21-09-2006	WO 2006101821 A2	28-09-2006
EP 1107031 A	13-06-2001	CN 1305248 A	25-07-2001
		JP 3463244 B2	05-11-2003
		JP 2001228368 A	24-08-2001
		JP 2003294982 A	15-10-2003
		KR 20010062142 A	07-07-2001
		SG 97983 A1	20-08-2003
		TW 504059 Y	21-09-2002
		US 6371657 B1	16-04-2002
US 5717810 A	10-02-1998	US RE38311 E1	11-11-2003
US 5522561 A	04-06-1996	NONE	

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2008/072218	05.08.2008	06.08.2007

International Patent Classification (IPC) or both national classification and IPC
INV. G02B6/44

Applicant
ADC TELECOMMUNICATIONS, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:	Date of completion of this opinion	Authorized Officer
European Patent Office - Gitschiner Str. 103 D-10958 Berlin Tel. +49 30 25901 - 0 Fax: +49 30 25901 - 840	see form PCT/ISA/210	Verdrager, Véronique Telephone No. +49 30 25901-648

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

      ☐ a sequence listing

      ☐ table(s) related to the sequence listing

   b. format of material:

      ☐ on paper

      ☐ in electronic form

   c. time of filing/furnishing:

      ☐ contained in the international application as filed.

      ☐ filed together with the international application in electronic form.

      ☐ furnished subsequently to this Authority for the purposes of search.

4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	2-5,9,11,12,14,15
	No:	Claims	1,6-8,10,13,16,17
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-17
Industrial applicability (IA)	Yes:	Claims	1-17
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement. Major clarity objections having an impact on novelty, inventive step or industrial applicability

1. Cited documents

1. The following documents are referred to in this communication; the numbering will be adhered to in the rest of the procedure:

D1: US-B1-6 220 413 (WALTERS MARK D [US] ET AL) 24 April 2001 (2001-04-24)
D2: EP-A-1 107 031 (MOLEX INC [US]) 13 June 2001 (2001-06-13)
D3: US-A-5 717 810 (WHEELER TODD A [US]) 10 February 1998 (1998-02-10)
D4: US-A-5 522 561 (KOYAMATSU ANTHONY H [US] ET AL) 4 June 1996 (1996-06-04)

2. Clarity

2.1 The application does not meet the requirements of Article 6 PCT, because the subject-matter of claims 5,6,9 is not clear.

2.2 The expression "axial end" used in claims 5,6,9 is vague and unclear and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claims unclear, Article 6 PCT.

3. Novelty

3.1 The present application does not meet the requirements of Article 33(2) PCT, because the subject-matter of claims 1,6-8,10,13,16,17 is not new.

3.2 Document D1 discloses a fiber optic enclosure assembly for enclosing optical fiber

connections (figure 5; column 1, lines 23-31) comprising:
a housing (27) having an interior region;
a bearing mount (41) disposed in the interior region of the housing;
a cable spool engaged with the bearing mount such that the cable spool (11) selectively rotates within the housing (column 2, lines 41-47); and
a termination module (47) disposed on the cable spool (11) so that the termination module rotates in unison with the cable spool (column 2, lines 53-54).
The subject-matter of claim 1 is therefore not new (Article 33(2) PCT).

3.3 Independent claim 8 describes a method of paying out a fiber optic cable from a fiber optic enclosure. The method of claim 8 does not add any technical feature to claim 1. Therefore, the use of the apparatus according to D1 anticipates the novelty of the subject-matter of claim 8 which, therefore, is not new in the sense of article 33(2) PCT.

3.4 D1 discloses the additional features introduced by dependent claims 6,7,10,13,16,17:
- claims 6,7 (slack storage area, cable management spool): column 2, lines 14-22;
- claims 10,13 (connected plurality of adapters): figure 5, (55); column 2, lines 57 - column 3, line 5;
- claims 16,17 (fixing the spool with a pin): column 3, lines 25-33.

4. Inventive step

4.1 The present application does not meet the requirements of Article 33(3) PCT, because the subject-matter of claims 2-5,9,11,12,14,15 does not involve an inventive step.

4.2 The features of claims 2,3,4,11,12 (needle bearing; adapter slot; sliding adapter modules) are merely some of several straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to solve the problem posed (see also D2: [0021],figures 1,11-13 and D3: figure 18).

4.3 In claim 5 (cable passage) a slight constructional change is defined which comes

within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen (see D4 figure 8, column 6, lines 31-37).

4.4 In claim 9, the position of the termination module is a slight constructional change which comes within the scope of the customary practice followed by persons skilled in the art.

4.5 The features of claims 14,15 (housing mounted to a wall; container) are merely some of several straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to solve the problem posed.

Re Item VII

Certain formal defects in the international application

1. Independent claims 1 and 8 are not in the two-part form in accordance with Rule 6.3(b) PCT.

2. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

3. The document D1 is not identified in the description and the relevant background art disclosed therein is not briefly discussed (Rule 5.1(a)(ii)).

4. In order to facilitate the examination of the conformity of the amended application with the requirements of Article 34(2)(b) PCT, the applicant is requested to clearly identify the amendments carried out, no matter whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as filed on which these amendments are based (see also Rule 66.8(a) PCT).
   If the applicant regards it as appropriate these indications could be submitted in handwritten form on a copy of the relevant parts of the application as filed.

Possible steps after receipt of the international search report (ISR) and written opinion of the International Searching Authority (WO-ISA)

General information	For all international applications filed on or after 01/01/2004 the competent ISA will establish an ISR. It is accompanied by the WO-ISA. Unlike the former written opinion of the IPEA (Rule 66.2 PCT), the WO-ISA is not meant to be responded to, but to be taken into consideration for further procedural steps. This document explains about the possibilities.
Amending claims under Art. 19 PCT	Within 2 months after the date of mailing of the ISR and the WO-ISA the applicant may file amended claims under Art. 19 PCT directly with the International Bureau of WIPO. The PCT reform of 2004 did not change this procedure. For further information please see Rule 46 PCT as well as form PCT/ISA/220 and the corresponding Notes to form PCT/ISA/220.
Filing a demand for international preliminary examination	In principle, the WO-ISA will be considered as the written opinion of the IPEA. This should, in many cases, make it unnecessary to file a demand for international preliminary examination. If the applicant nevertheless wishes to file a demand this must be done before expiry of 3 months after the date of mailing of the ISR/WO-ISA or 22 months after priority date, whichever expires later (Rule 54bis PCT). Amendments under Art. 34 PCT can be filed with the IPEA as before, normally at the same time as filing the demand (Rule 66.1 (b) PCT). If a demand for international preliminary examination is filed and no comments/amendments have been received the WO-ISA will be transformed by the IPEA into an IPRP (International Preliminary Report on Patentability) which would merely reflect the content of the WO-ISA. The demand can still be withdrawn (Art. 37 PCT).
Filing informal comments	After receipt of the ISR/WO-ISA the applicant may file informal comments on the WO-ISA directly with the International Bureau of WIPO. These will be communicated to the designated Offices together with the IPRP (International Preliminary Report on Patentability) at 30 months from the priority date. Please also refer to the next box.
End of the international phase	At the end of the international phase the International Bureau of WIPO will transform the WO-ISA or, if a demand was filed, the written opinion of the IPEA into the IPRP, which will then be transmitted together with possible informal comments to the designated Offices. The IPRP replaces the former IPER (international preliminary examination report).
Relevant PCT Rules and more information	Rule 43 PCT, Rule 43bis PCT, Rule 44 PCT, Rule 44bis PCT, PCT Newsletter 12/2003, OJ 11/2003, OJ 12/2003

IPR2025-01119
Belden EX1006

Electronic Acknowledgement Receipt

EFS ID:	5172320
Application Number:	12182705
International Application Number:	
Confirmation Number:	4252
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
Customer Number:	23552
Filer:	David G. Schmaltz/Kristine Wacek
Filer Authorized By:	David G. Schmaltz
Attorney Docket Number:	02316.2584USU2
Receipt Date:	17-APR-2009
Filing Date:	30-JUL-2008
Time Stamp:	12:16:22
Application Type:	Utility under 35 USC 111(a)

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	Information Disclosure Statement (IDS) Filed (SB/08)	P-IDS-4-and-P-1449-4.PDF	110704 f332739a01f01772a37ede1ac4443be276ec1a01	no	3

Warnings:	
Information:	

This is not an USPTO supplied IDS fillable form					
2	Foreign Reference	EP1107031A1.PDF	1044856 34c9fc22f963a656c40dd876ebaf7b22fbb2f243	no	29
Warnings:					
Information:					
3	NPL Documents	International-Search-Report-mailed-03-18-2009.PDF	746681 fc9800c68e265f3810e756f9c24885881ce95244	no	15
Warnings:					
Information:					
			Total Files Size (in bytes):	1902241	

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
12/182,705	07/30/2008	Scott C. Kowalczyk	02316.2584USU2

CONFIRMATION NO. 4252

23552
MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

PUBLICATION NOTICE

OC00000035076218

Title:FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

Publication No.US-2009-0074370-A1
Publication Date:03/19/2009

NOTICE OF PUBLICATION OF APPLICATION

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

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

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

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

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

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	KOWALCZYK ET AL.	Examiner:	UNKNOWN
Serial No.:	12/182,705	Group Art Unit:	2874
Filed:	JULY 30, 2008	Docket No.:	2316.2584USU2
Title:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL		

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT (37 C.F.R. § 1.97(b))

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

23552
PATENT TRADEMARK OFFICE

Dear Sir:

With regard to the above-identified application, the items of information listed on the enclosed Form 1449 are brought to the attention of the Examiner.

This statement should be considered because it is submitted before the mailing date of a first Office Action on-the-merits. Accordingly, no fee is due for consideration of the items listed on the enclosed Form 1449.

In accordance with 37 C.F.R. §1.98(a)(2), a copy of each foreign patent and/or a copy of each publication, other than U.S. patents and U.S. patent application publications, listed on the accompanying Form 1449 is enclosed.

No representation is made that a reference is "prior art" within the meaning of 35 U.S.C. §§ 102 and 103 and Applicants reserve the right, pursuant to 37 C.F.R. § 1.131 or otherwise, to establish that the reference(s) are not "prior art." Moreover, Applicants do not represent that a reference has been thoroughly reviewed or that any relevance of any portion of a reference is intended.

Consideration of the items listed is respectfully requested. Pursuant to the provisions of M.P.E.P. 609, it is requested that the Examiner return a copy of the attached Form 1449, marked as being considered and initialed by the Examiner, to the undersigned with the next official communication.

Please charge any additional fees or credit any overpayment to Deposit Account No. 13-2725.

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, Minnesota 55402-0903
(612) 332-5300

Date: February 18, 2009

/David G. Schmaltz/
David G. Schmaltz
Reg. No. 39,828
DGS:PLSkaw

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 2316.2584USU2	Application Number: 12/182,705
	Applicant: KOWALCZYK ET AL.	
	Filing Date: 07/30/2008	Group Art Unit: 2874

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	7,346,253 B2	03/18/2008	Bloodworth et al.			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

23552
PATENT TRADEMARK OFFICE

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Electronic Acknowledgement Receipt

EFS ID:	4816303
Application Number:	12182705
International Application Number:	
Confirmation Number:	4252
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
Customer Number:	23552
Filer:	David G. Schmaltz/Kristine Wacek
Filer Authorized By:	David G. Schmaltz
Attorney Docket Number:	02316.2584USU2
Receipt Date:	18-FEB-2009
Filing Date:	30-JUL-2008
Time Stamp:	16:57:23
Application Type:	Utility under 35 USC 111(a)

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	Information Disclosure Statement Letter	P-IDS-3.PDF	20130 1b71989301a0504143710c5e73437fdf0ed637e0	no	2

Warnings:	
Information:	

2	Information Disclosure Statement (IDS) Filed (SB/08)	P-1449-3.PDF	24733 9b05dcb04a8041e844af1fa76114bd7b641e1da9	no	1

Warnings:	
Information:	
This is not an USPTO supplied IDS fillable form	
Total Files Size (in bytes):	44863

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	KOWALCZYK ET AL.	Examiner:	UNKNOWN
Serial No.:	12/182,705	Group Art Unit:	UNKNOWN
Filed:	JULY 30, 2008	Docket No.:	2316.2584USU2
Title:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL		

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT (37 C.F.R. § 1.97(b))

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

23552
PATENT TRADEMARK OFFICE

Dear Sir:

With regard to the above-identified application, the items of information listed on the enclosed Form 1449 are brought to the attention of the Examiner. At least some of the references were recently cited in an International Search Report mailed November 18, 2008. Applicants note U.S. Patent No. 4,913,369, German Patent No. 42 26 368 A1 and Japanese Patent No. 2005-249858 listed in the Search Report was/were previously cited to or by the Examiner.

This statement should be considered because it is submitted before the mailing date of a first Office Action on-the-merits. Accordingly, no fee is due for consideration of the items listed on the enclosed Form 1449.

Certification Under 37 C.F.R. § 1.704(d)

In accordance with 37 C.F.R. § 1.704(d), the undersigned hereby certifies that each item listed on the enclosed Form 1449 was cited in a communication from a foreign patent office in a counterpart application, and that this communication was not received by any individual designated in 37 C.F.R. § 1.56(c) more than thirty (30) days prior to the filing of this Information Disclosure Statement. Accordingly, no patent term adjustment is due for the filing of this Information Disclosure Statement.

A copy of any foreign patent document or "Other Document" listed on the Form 1449 is enclosed, in accordance with 37 C.F.R. §1.98(a)(2). Because this application was filed after June

30, 2003, copies of the U.S. Patents and U.S. patent publications listed on the enclosed Form 1449 are not provided.

No representation is made that a reference is "prior art" within the meaning of 35 U.S.C. §§ 102 and 103 and Applicants reserve the right, pursuant to 37 C.F.R. § 1.131 or otherwise, to establish that the reference(s) are not "prior art." Moreover, Applicants do not represent that a reference has been thoroughly reviewed or that any relevance of any portion of a reference is intended.

Consideration of the items listed is respectfully requested. Pursuant to the provisions of M.P.E.P. 609, it is requested that the Examiner return a copy of the attached Form 1449, marked as being considered and initialed by the Examiner, to the undersigned with the next official communication.

Please charge any additional fees or credit any overpayment to Deposit Account No. 13-2725.

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, Minnesota 55402-0903
(612) 332-5300

Date: December 17, 2008

/David G. Schmaltz/
David G. Schmaltz
Reg. No. 39,828
DGS:PLSkaw

IPR2025-01119
Page 191 of 332
Belden EX1006

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 2316.2584USU2	Application Number: 12/182,705
	Applicant: KOWALCZYK ET AL.	
	Filing Date: 07/30/2008	Group Art Unit: UNKNOWN

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	2,727,703	12/20/1955	Bonnett			
	6,669,129 B1	12/30/2003	Shah			
	2006/0183362 A1	08/17/2006	Mullaney et al.			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

		International Search Report and Written Opinion mailed November 18, 2008

23552
PATENT TRADEMARK OFFICE

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Electronic Acknowledgement Receipt

EFS ID:	4474486
Application Number:	12182705
International Application Number:	
Confirmation Number:	4252
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
Customer Number:	23552
Filer:	David G. Schmaltz/Kristine Wacek
Filer Authorized By:	David G. Schmaltz
Attorney Docket Number:	02316.2584USU2
Receipt Date:	17-DEC-2008
Filing Date:	30-JUL-2008
Time Stamp:	15:33:41
Application Type:	Utility under 35 USC 111(a)

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	Information Disclosure Statement Letter	P-IDS-2.PDF	22583 e7e1b192a0bea5626325577cb7fbd556013f32cf	no	2

Warnings:	
Information:	

2	Information Disclosure Statement (IDS) Filed (SB/08)	P-1449-2.PDF	24925 61e1146b689724536885ba3ef12793f72a98fe98	no	1
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	NPL Documents	International-Search-Report-mailed-11-18-2008.PDF	676381 ed7dfaabebdf9680c083802f7d1038ea76f8b8e0	no	13
Warnings:					
Information:					
		Total Files Size (in bytes):	723889		

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
12/182,705	07/30/2008	2874	1160	02316.2584USU2	17	2

CONFIRMATION NO. 4252

UPDATED FILING RECEIPT

23552
MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

OC000000033490334

Date Mailed: 12/09/2008

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

Applicant(s)

Scott C. Kowalczyk, Savage, MN;
Jonathan Walter Coan, Savage, MN;
Jonathan R. Kaml, Shakopee, MN;

Assignment For Published Patent Application

ADC Telecommunications, Inc., Eden Prairie, MN

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 60/954,214 08/06/2007
and claims benefit of 61/029,248 02/15/2008

Foreign Applications

If Required, Foreign Filing License Granted: 08/28/2008

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/182,705**

Projected Publication Date: 03/19/2009

Non-Publication Request: No

Early Publication Request: No

Title

FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

Preliminary Class

385

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 (1-866-999-4158).

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).

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	KOWALCZYK ET AL.	Examiner:	UNKNOWN
Serial No.:	12/182,705	Group Art Unit:	2874
Filed:	JULY 30, 2008	Docket No.:	02316.2584USU2
Customer No.:	23552	Confirmation No.:	4252
Title:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL		

Electronically filed December 2, 2008.

SUBMISSION OF DRAWING REPLACEMENT SHEETS

Commissioner for Patents
Attn: Official Draftsman
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

Submitted herewith are 14 Drawing Replacement Sheets in compliance with the requirements of the Notice to File Missing Parts of Nonprovisional Application mailed September 2, 2008.

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, Minnesota 55402-0903
612.332.5300

Dated: December 2, 2008

Signed: /David G. Schmaltz/
Reg. No.: 39,828
DSchmaltz/aml

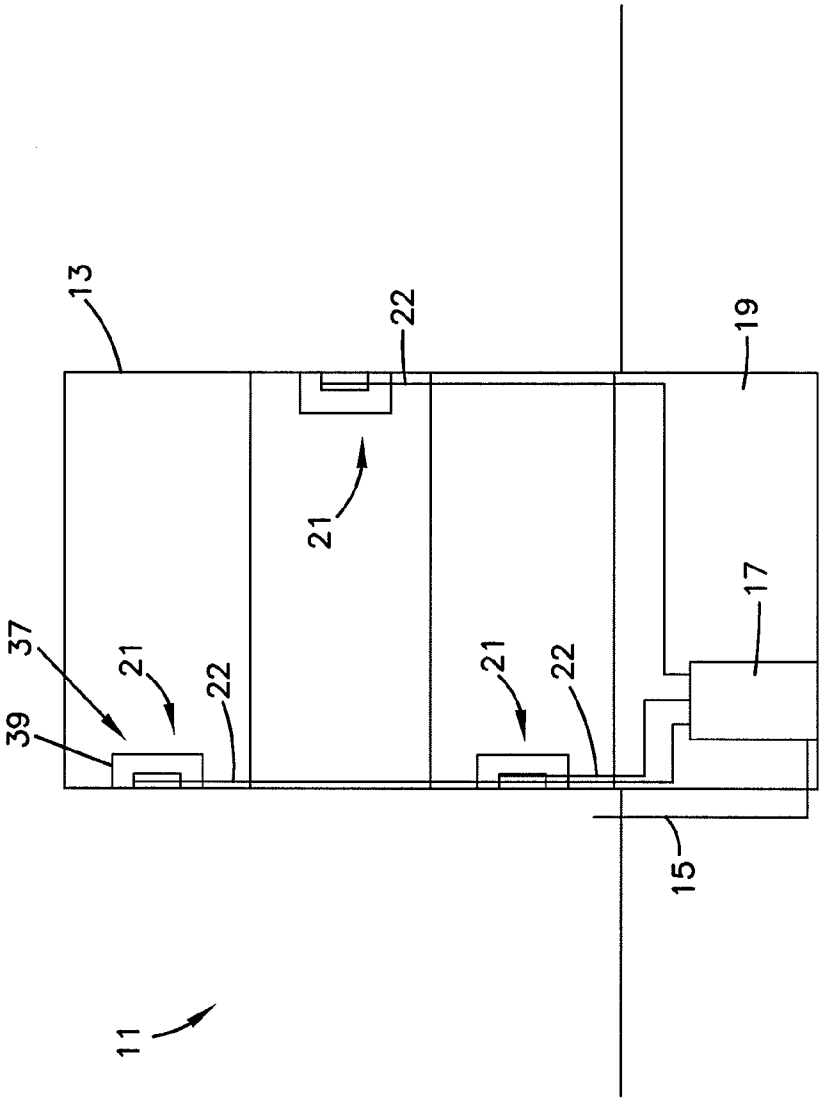


FIG. 1

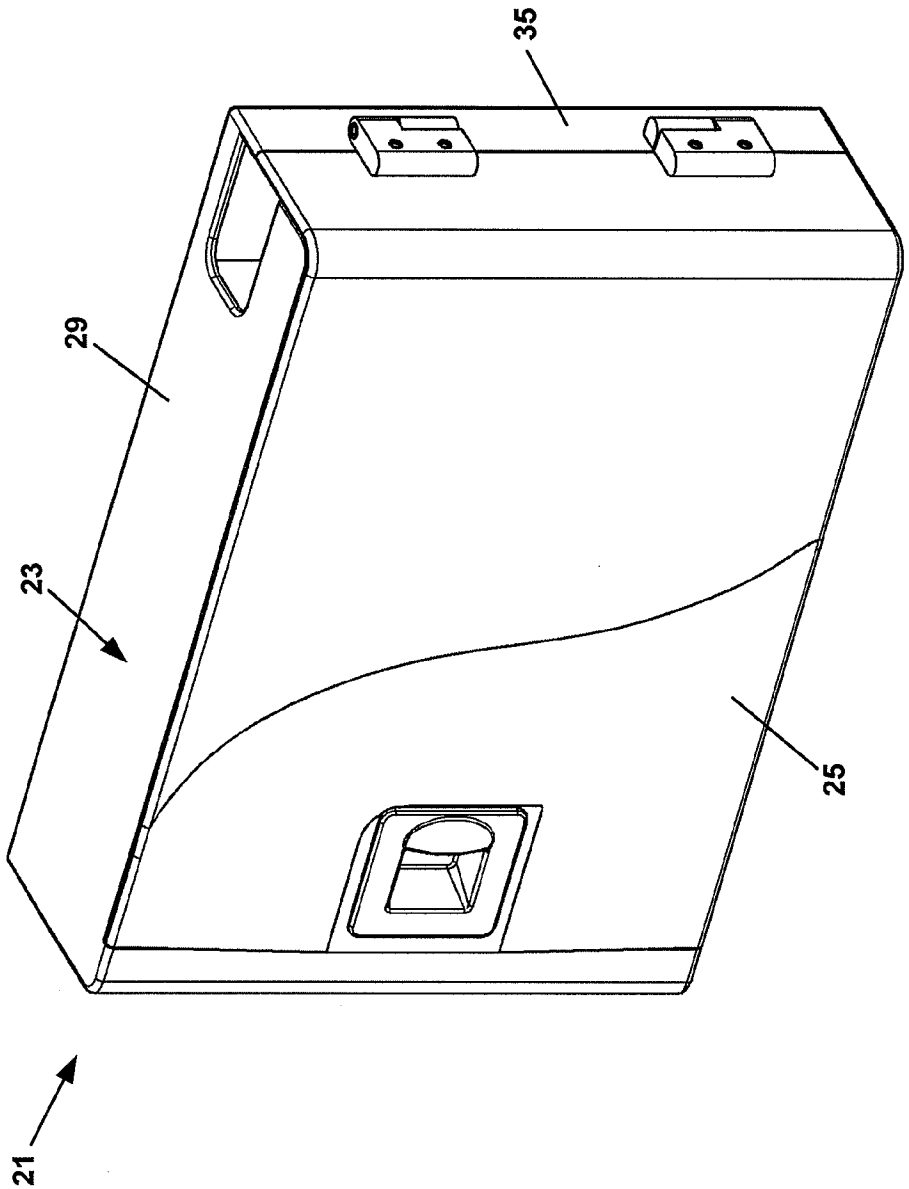


FIG. 2

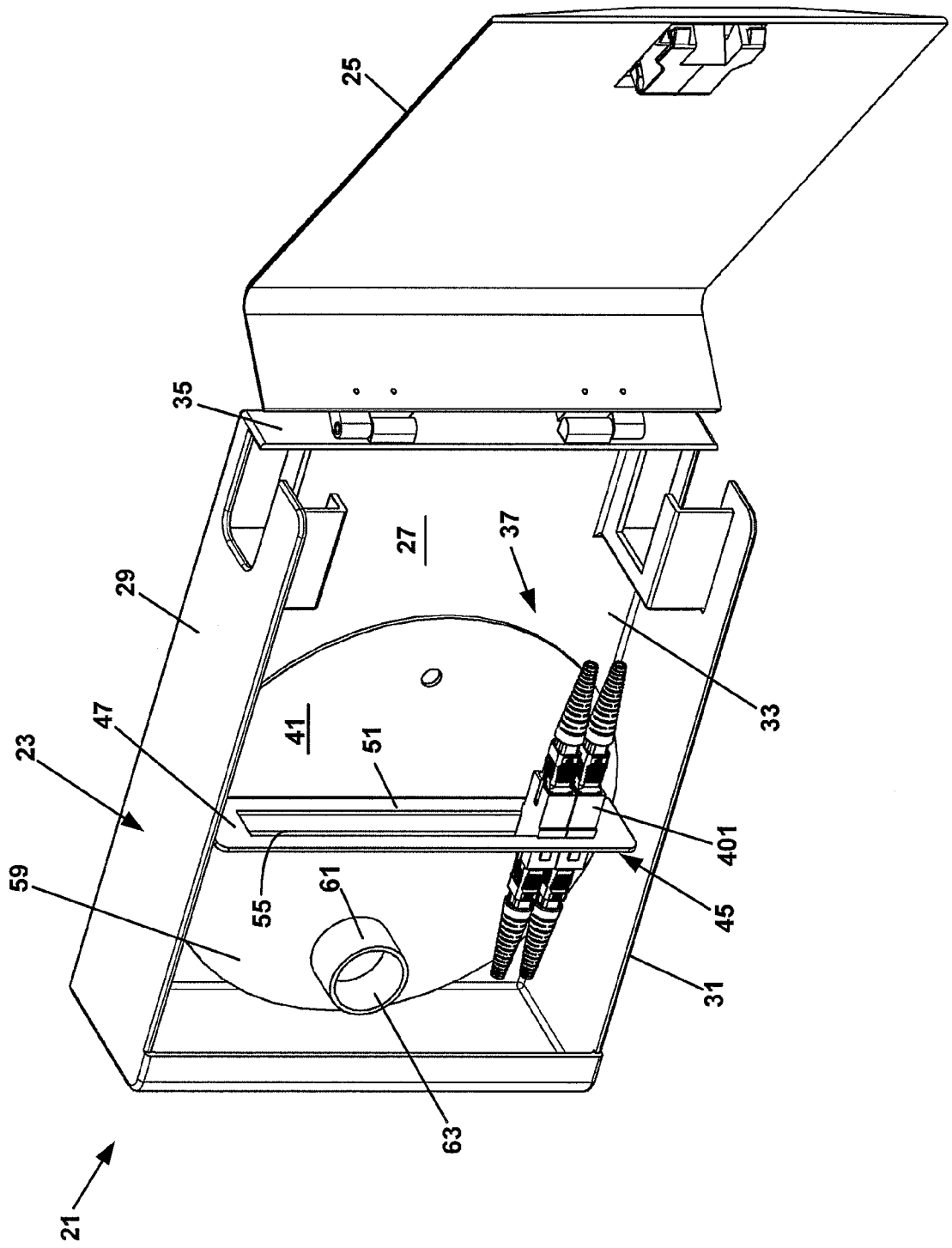


FIG. 3

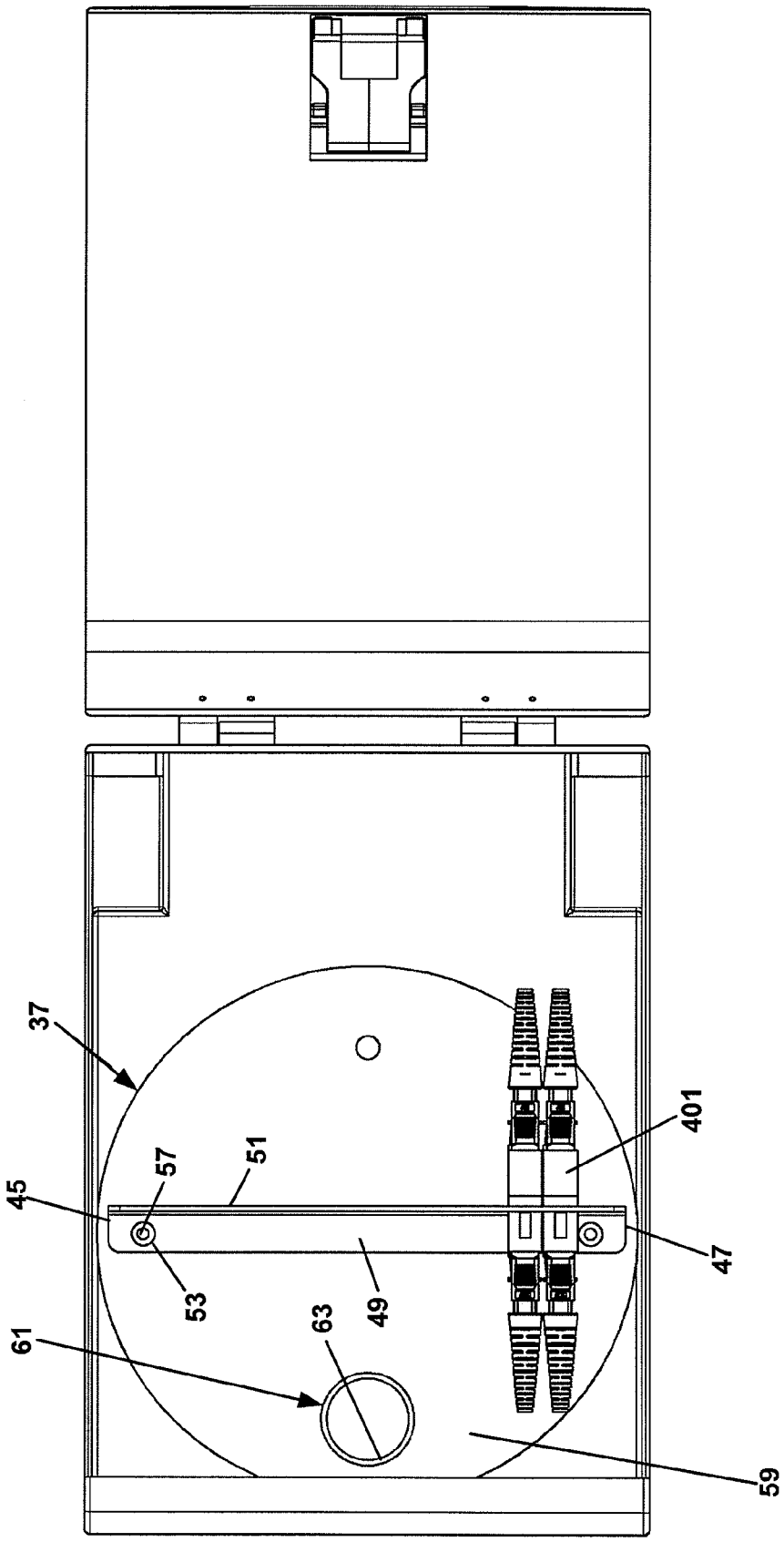


FIG. 4

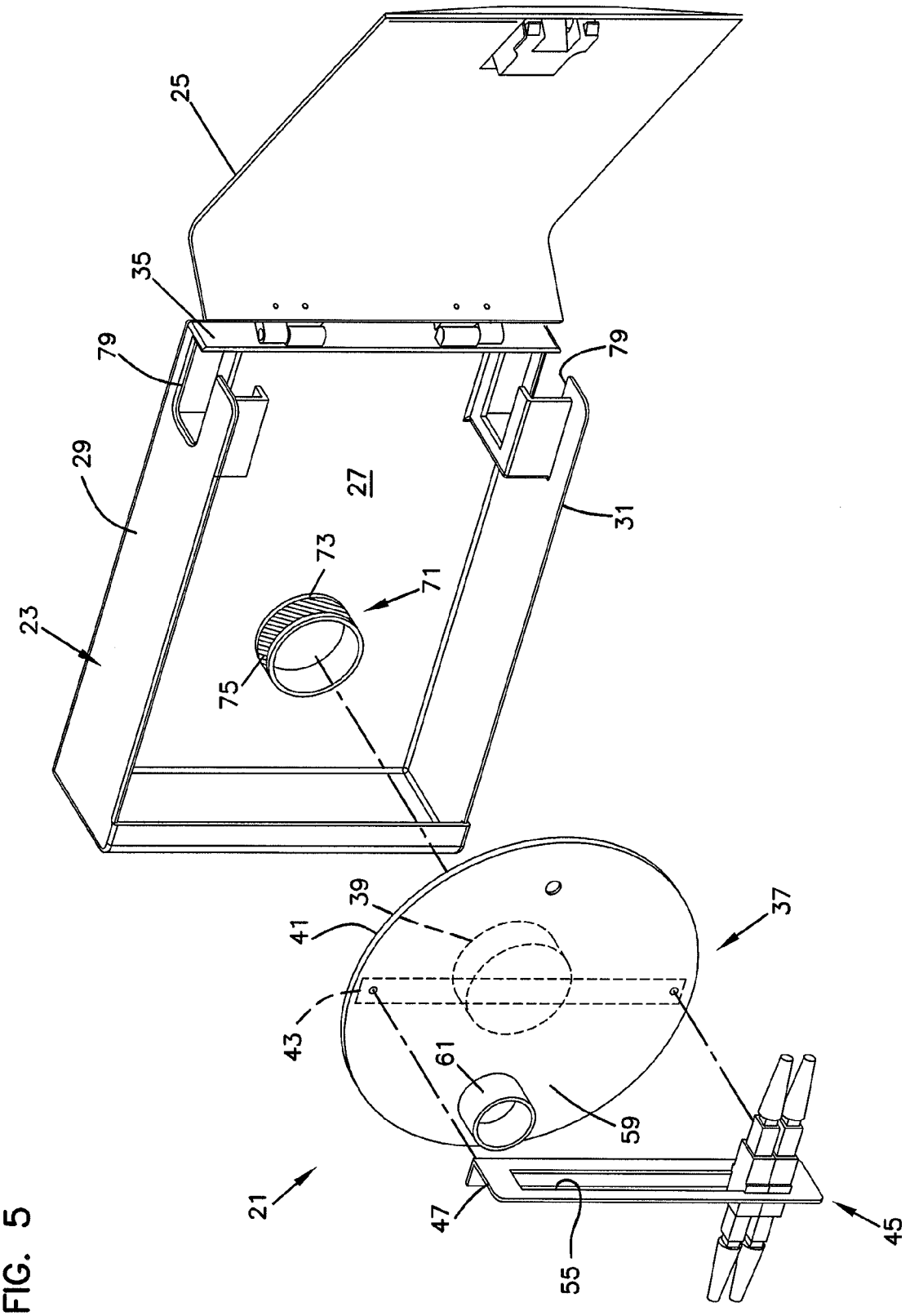


FIG. 5

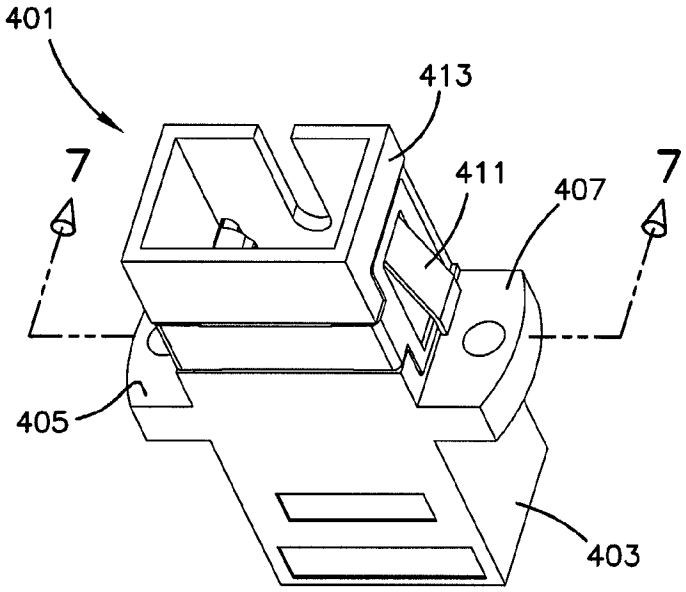


FIG. 6

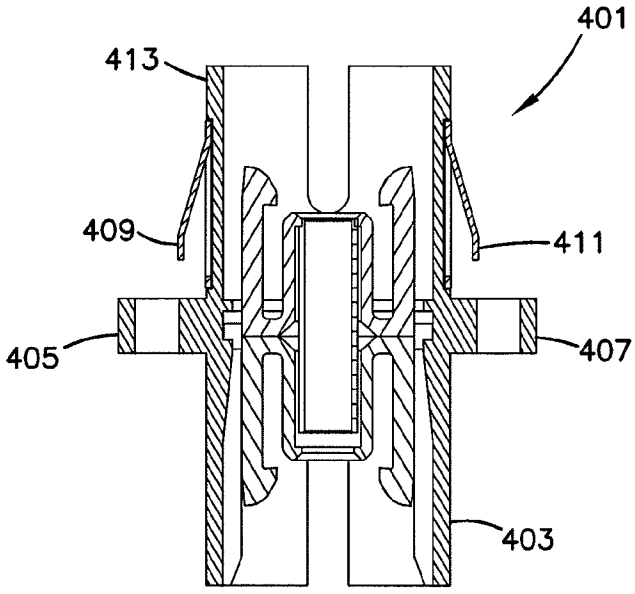


FIG. 7

FIG. 8

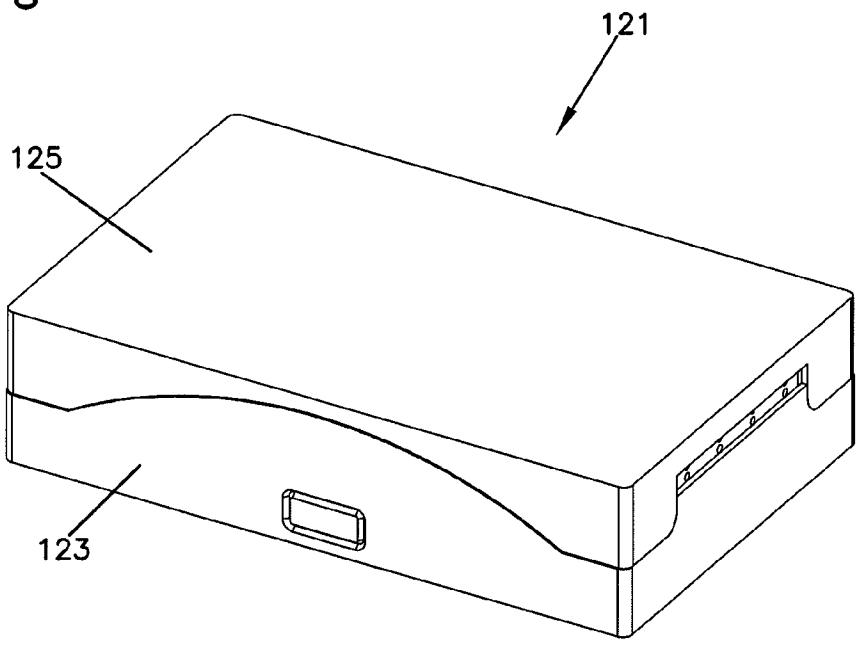


FIG. 9

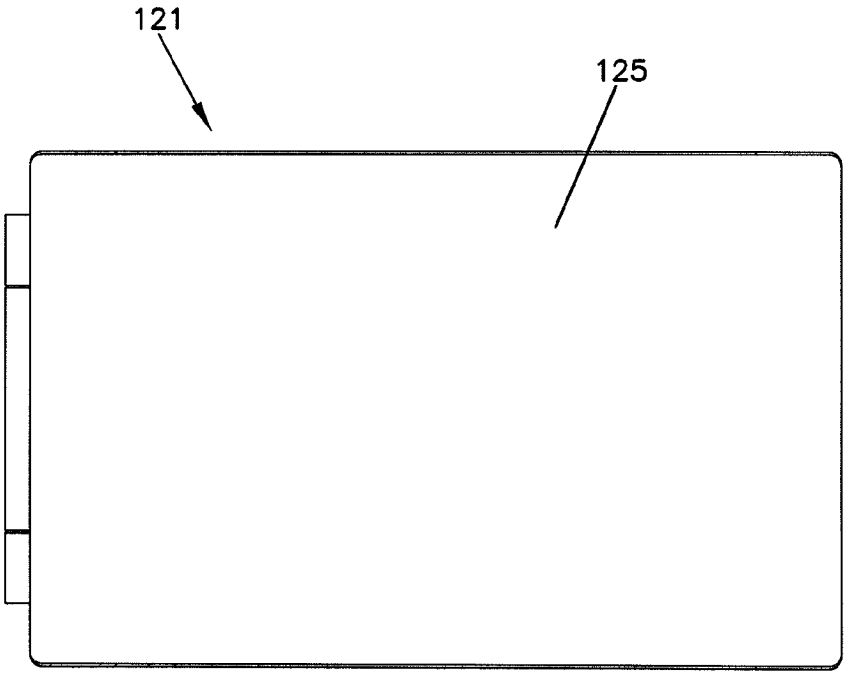


FIG. 10

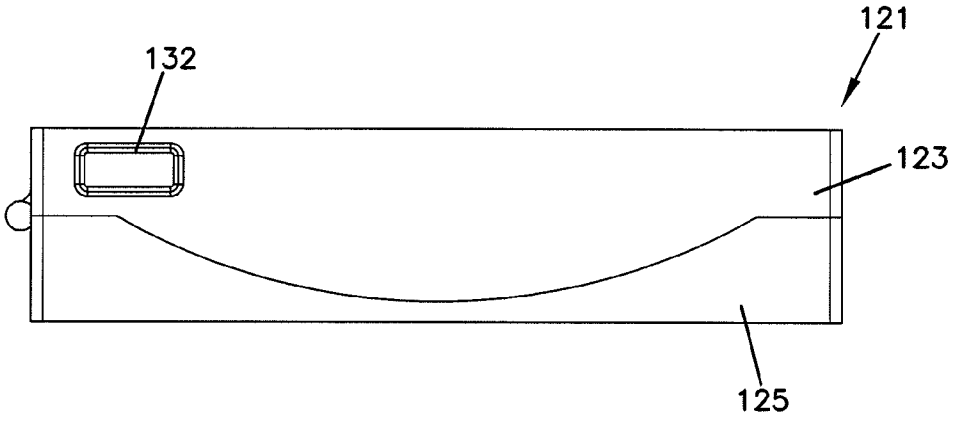


FIG. 11

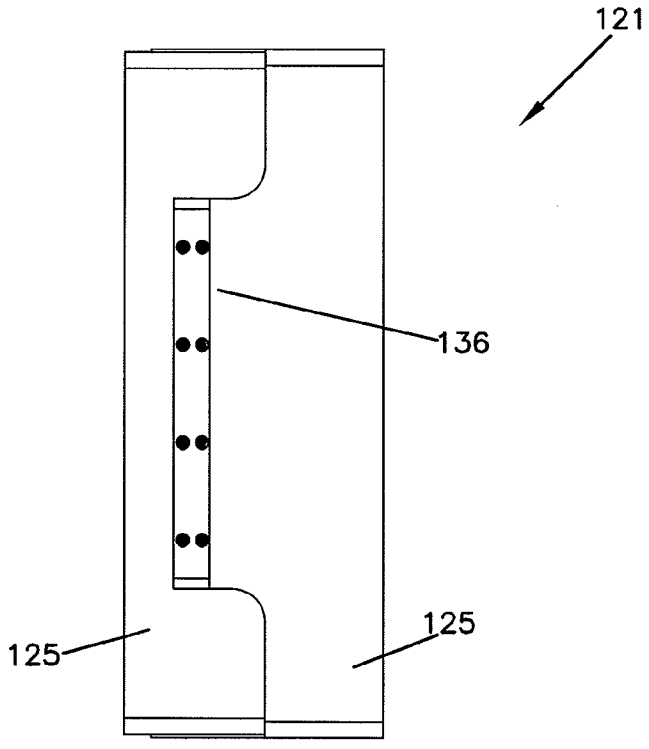


FIG. 12

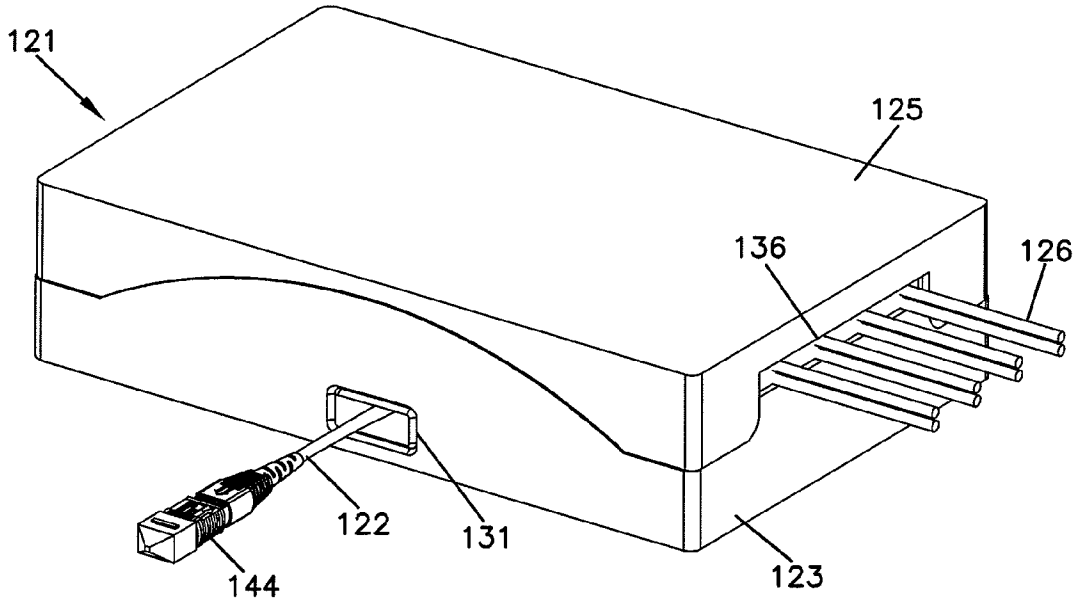
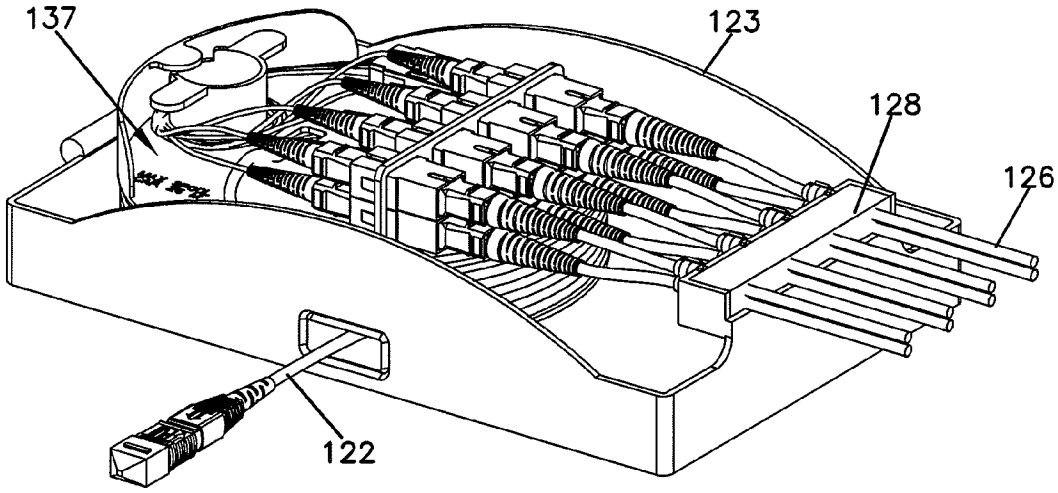


FIG. 13



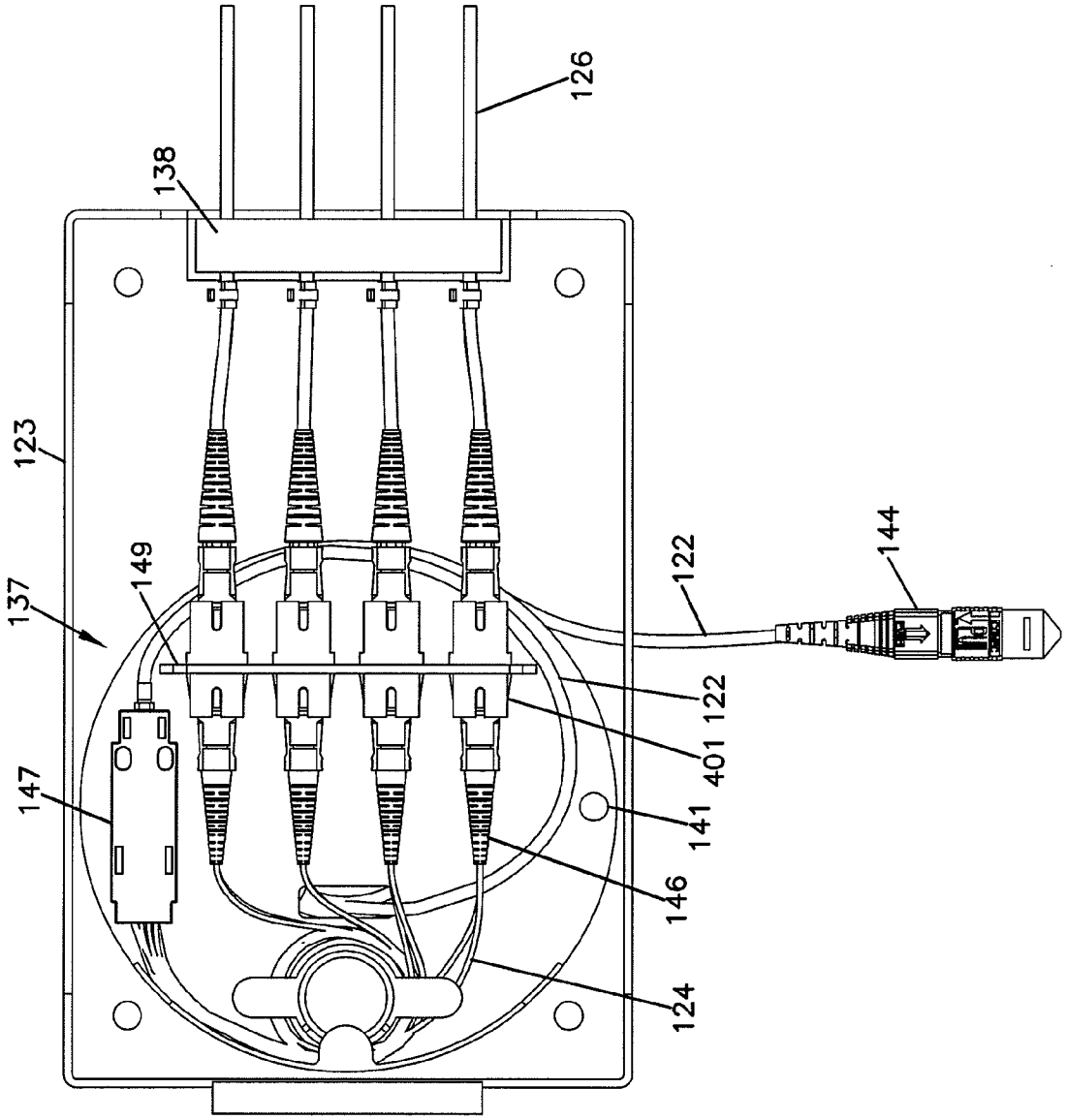


FIG. 14

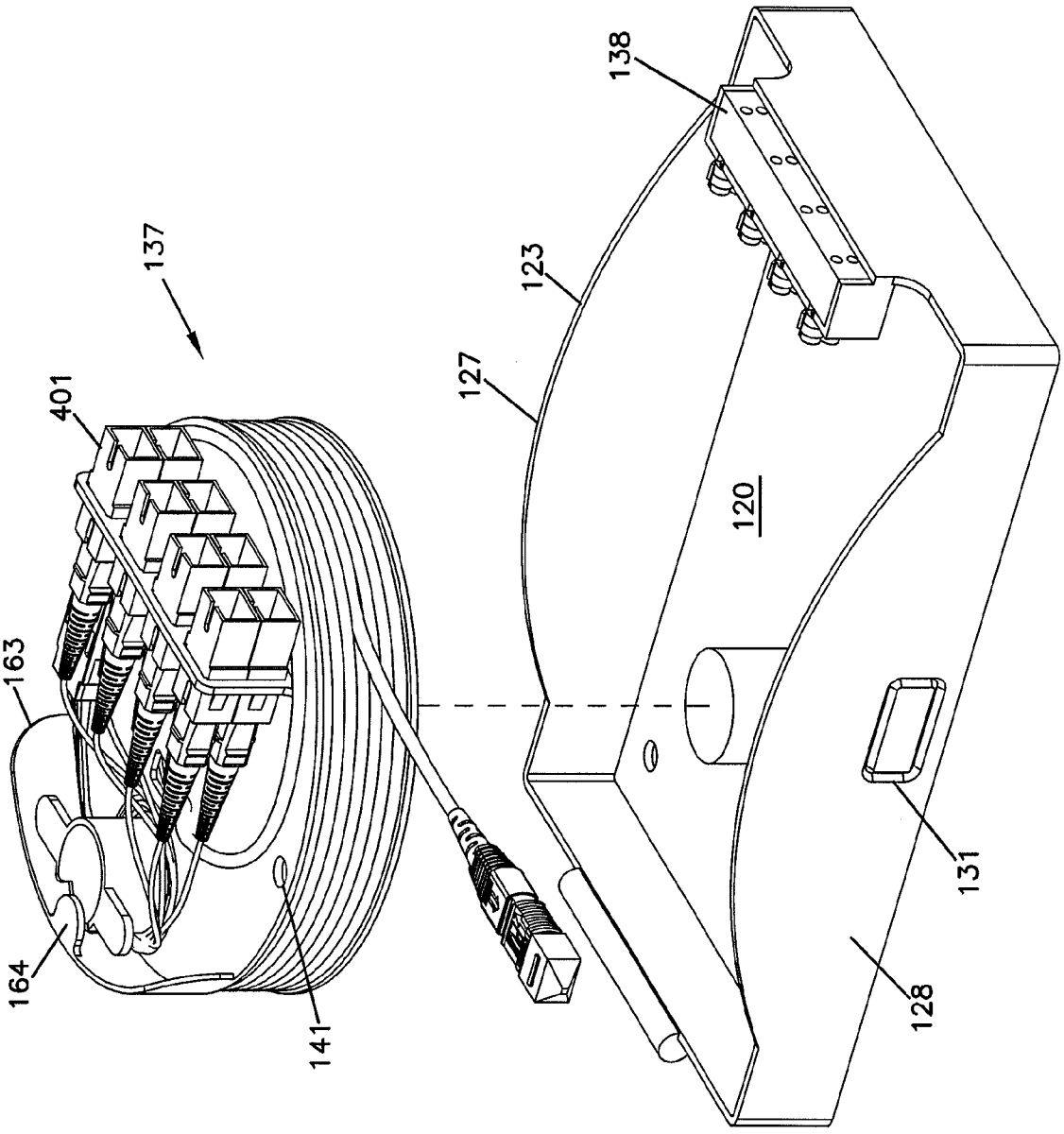


FIG. 15

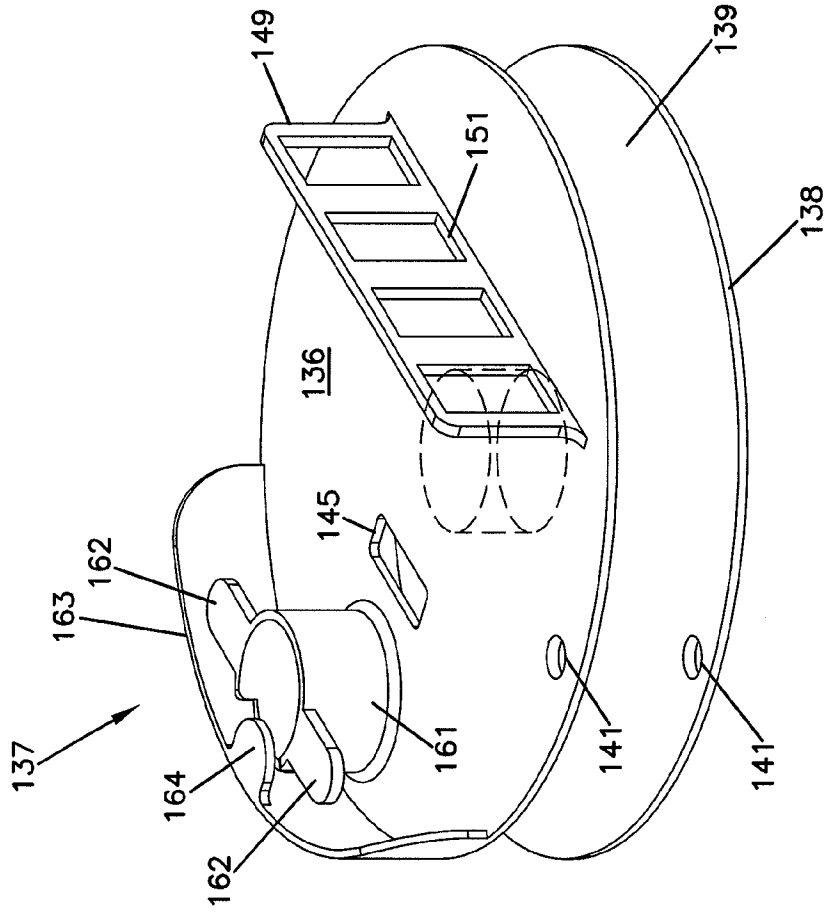


FIG. 16

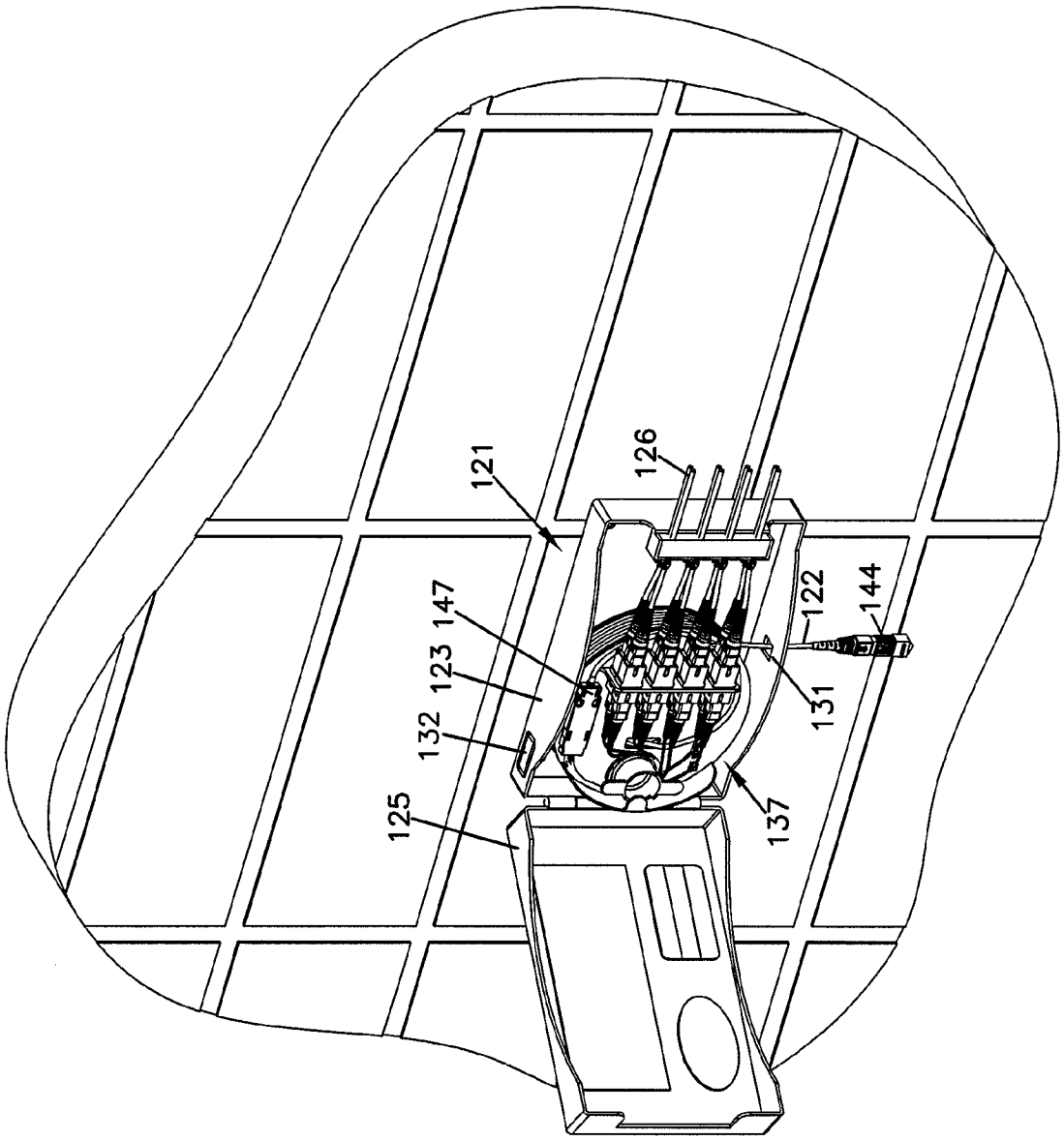
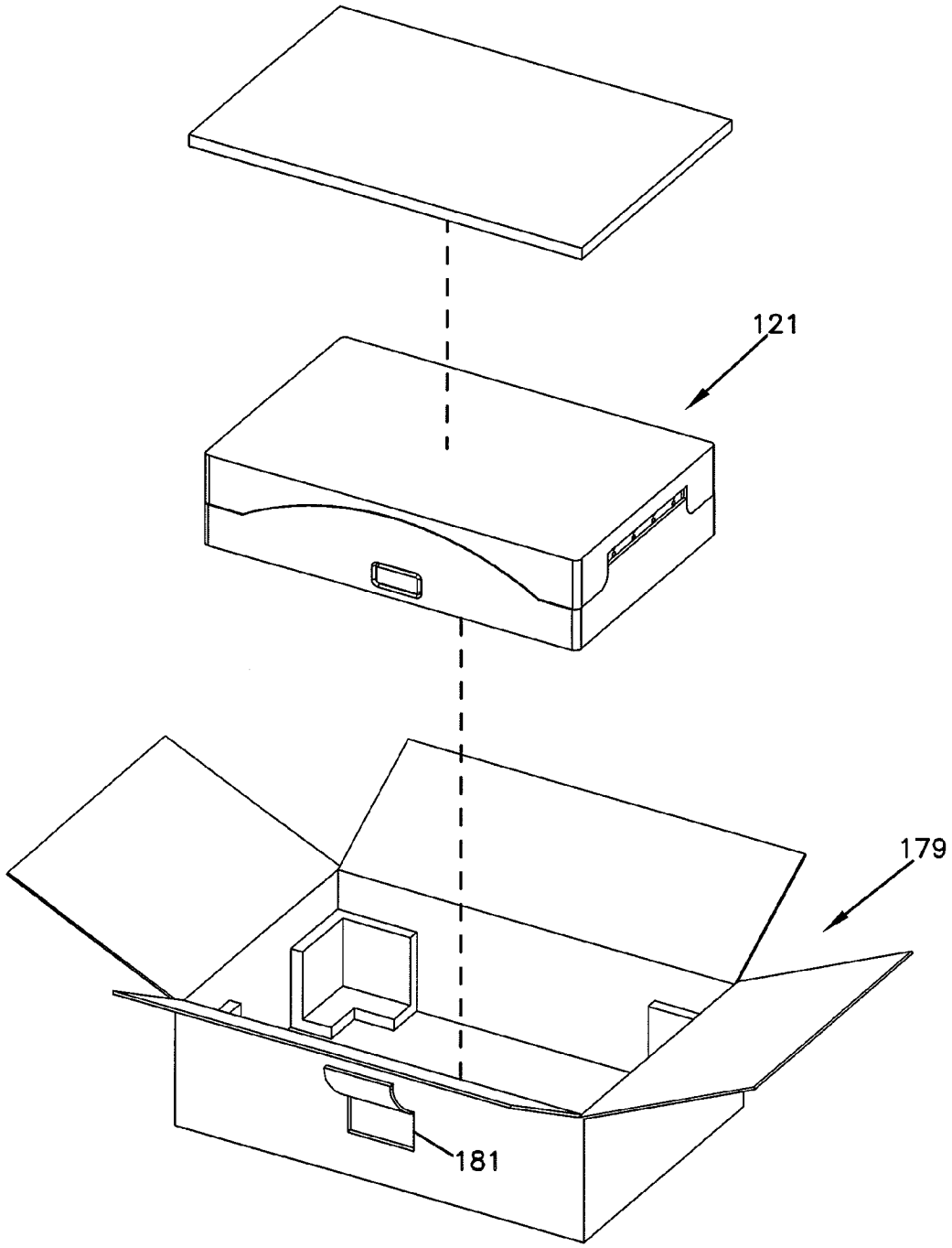


FIG. 17

FIG. 18



Electronic Patent Application Fee Transmittal

Application Number:	12182705
Filing Date:	30-Jul-2008
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
Filer:	David G. Schmaltz/Anne Lee
Attorney Docket Number:	02316.2584USU2

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Late filing fee for oath or declaration	1051	1	130	130
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 1 month with $0 paid	1251	1	130	130
Miscellaneous:				
			Total in USD ($)	**260**

Electronic Acknowledgement Receipt

EFS ID:	4382003
Application Number:	12182705
International Application Number:	
Confirmation Number:	4252
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
Customer Number:	23552
Filer:	David G. Schmaltz/Anne Lee
Filer Authorized By:	David G. Schmaltz
Attorney Docket Number:	02316.2584USU2
Receipt Date:	02-DEC-2008
Filing Date:	30-JUL-2008
Time Stamp:	16:51:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$260
RAM confirmation Number	2063
Deposit Account	132725
Authorized User	SCHMALTZ,DAVID G.

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

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

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

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)					
File Listing:					
Document Number	**Document Description**	**File Name**	**File Size(Bytes)/ Message Digest**	**Multi Part /.zip**	**Pages (if appl.)**
1	Extension of Time	2584usu2-eot-mparts.PDF	74981 f62e6ec6fa372c5f1b9f3a0b4c1fb986d9532189	no	1
Warnings:					
Information:					
2	Oath or Declaration filed	2584usu2-signed-comdec.PDF	247230 3eadf963f65ff9b865228f442063dd5e25bf78e8	no	4
Warnings:					
Information:					
3	Miscellaneous Incoming Letter	2584usu2-sub-drw-repl-shts.PDF	75673 d8069ee927b79433c2a83b93c6b1f134b309712a	no	1
Warnings:					
Information:					
4	Drawings-only black and white line drawings	2584usu2-repl-drw-shts.PDF	258721 2eea7c94c639b1414acb3ee6723f6e1c785dbb1b	no	14
Warnings:					
Information:					
5	Fee Worksheet (PTO-06)	fee-info.pdf	32559 97765232c4bb43487351b9466f2ef781eedc0f7c	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	689164		

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	KOWALCZYK ET AL.	Examiner:	UNKNOWN
Serial No.:	12/182,705	Group Art Unit:	2874
Filed:	JULY 30, 2008	Docket No.:	02316.2584USU2
Customer No.:	23552	Confirmation No.:	4252
Title:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL		

Electronically filed December 2, 2008.

PETITION FOR EXTENSION OF TIME

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

In accordance with the provisions of 37 C.F.R. §1.136(a), it is respectfully requested that a one-month extension of time be granted in which to respond to the communication mailed September 2, 2008, the period of response being extended from November 2, 2008 to December 2, 2008.

Payment is being made via credit card in the amount of $130.00 to cover the required extension fee for a large entity. Please charge any additional fees or credit any overpayment to Deposit Account. No. 13-2725.

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, Minnesota 55402-0903
612.332.5300

Dated: December 2, 2008

Signed: /David G. Schmaltz/
Reg. No.: 39,828
DSchmaltz/aml

Attorney Docket No. 02316.2584USU2

MERCHANT & GOULD P.C.

United States Patent Application

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor I hereby declare that: my residence, post office address and citizenship are as stated below next to my name; that

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL.

The specification of which
a. ☐ is attached hereto
b. ☒ was filed on July 30, 2008 as application serial no. 12/182,705, which I have reviewed and for which I solicit a United States patent.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on the basis of which priority is claimed:

FOREIGN APPLICATION(S), IF ANY, CLAIMING PRIORITY UNDER 35 USC § 119			
COUNTRY	**APPLICATION NUMBER**	**DATE OF FILING (day, month, year)**	**DATE OF ISSUE (day, month, year)**
ALL FOREIGN APPLICATION(S), IF ANY, FILED BEFORE THE PRIORITY APPLICATION(S)			
COUNTRY	**APPLICATION NUMBER**	**DATE OF FILING (day, month, year)**	**DATE OF ISSUE (day, month, year)**

I hereby claim the benefit under Title 35, United States Code, § 120/365 of any United States and PCT international application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. APPLICATION NUMBER	**DATE OF FILING (day, month, year)**	**STATUS (patented, pending, abandoned)**

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below:

U.S. PROVISIONAL APPLICATION NUMBER	**DATE OF FILING** (Day, Month, Year)
60/954,214	06 August 2007
61/029,248	15 February 2008

I acknowledge the duty to disclose information that is material to patentability of this application in accordance with Title 37, Code of Federal Regulations, § 1.56 (reprinted below):

§ 1.56 Duty to disclose information material to patentability.

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

(1) prior art cited in search reports of a foreign patent office in a counterpart application, and

(2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

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

(1) It establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim;

or

(2) It refutes, or is inconsistent with, a position the applicant takes in:

(i) Opposing an argument of unpatentability relied on by the Office, or

(ii) Asserting an argument of patentability.

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

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

(1) Each inventor named in the application:

(2) Each attorney or agent who prepares or prosecutes the application; and

(3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

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

(e) In any continuation-in-part application, the duty under this section includes the duty to disclose to the Office all information known to the person to be material to patentability, as defined in paragraph (b) of this section, which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby appoint the attorney(s) and/or patent agent(s) associated with the following customer number to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith.

23552
PATENT TRADEMARK OFFICE

I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/ organization who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct Merchant & Gould P.C. to the contrary.

I understand that the execution of this document, and the grant of a power of attorney, does not in itself establish an attorney-client relationship between the undersigned and the law firm Merchant & Gould P.C., or any of its attorneys.

Please direct all correspondence in this case to customer number 23552.

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

2	**Full Name Of Inventor**	**Family Name** Kowalczyk	**First Given Name** Scott	**Second Given Name** C.
0	**Residence & Citizenship**	**City** Savage	**State or Foreign Country** Minnesota	**Country of Citizenship** USA
1	**Mailing Address**	**Address** 7628 Southridge Court	**City** Savage	**State & Zip Code/Country** Minnesota 55378/USA
Signature of Inventor 201: Scott Kowalczyk			**Date:** 9-19-2008	
2	**Full Name Of Inventor**	**Family Name** Coan	**First Given Name** Jonathan	**Second Given Name** Walter
0	**Residence & Citizenship**	**City** Savage	**State or Foreign Country** Minnesota	**Country of Citizenship** USA
2	**Mailing Address**	**Address** 4441 West 134th Street	**City** Savage	**State & Zip Code/Country** Minnesota 55378/USA
Signature of Inventor 202:			**Date:** 9-19-2008	
2	**Full Name Of Inventor**	**Family Name** Kaml	**First Given Name** Jonathan	**Second Given Name** R.
0	**Residence & Citizenship**	**City** Shakopee	**State or Foreign Country** Minnesota	**Country of Citizenship** USA
3	**Mailing Address**	**Address** 560 Gorman Street, Apt. 312	**City** Shakopee	**State & Zip Code/Country** Minnesota 55379/USA
Signature of Inventor 203: Jonathan Kaml			**Date:** 09-19-2008	

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	KOWALCZYK ET AL.	Examiner:	UNKNOWN
Serial No.:	12/182,705	Group Art Unit:	UNKNOWN
Filed:	JULY 30, 2008	Docket No.:	2316.2584USU2
Title:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL		

INFORMATION DISCLOSURE STATEMENT (37 C.F.R. § 1.97(b))

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

23552
PATENT TRADEMARK OFFICE

Dear Sir:

With regard to the above-identified application, the items of information listed on the enclosed Form 1449 are brought to the attention of the Examiner. At least some of the references were recently cited in an International Search Report mailed August 8, 2008.

This statement should be considered because it is submitted within three months of the filing date of the above-identified application, which is not an application under 37 C.F.R. § 1.53(d). Accordingly, no fee is due for consideration of the items listed on the enclosed Form 1449.

Certification Under 37 C.F.R. § 1.704(d)

In accordance with 37 C.F.R. § 1.704(d), the undersigned hereby certifies that each item listed on the enclosed Form 1449 was cited in a communication from a foreign patent office in a counterpart application, and that this communication was not received by any individual designated in 37 C.F.R. § 1.56(c) more than thirty (30) days prior to the filing of this Information Disclosure Statement. Accordingly, no patent term adjustment is due for the filing of this Information Disclosure Statement.

A copy of any foreign patent document or "Other Document" listed on the Form 1449 is enclosed, in accordance with 37 C.F.R. §1.98(a)(2). Because this application was filed after June 30, 2003, copies of the U.S. Patents and U.S. patent publications listed on the enclosed Form 1449 are not provided.

No representation is made that a reference is "prior art" within the meaning of 35 U.S.C. §§ 102 and 103 and Applicants reserve the right, pursuant to 37 C.F.R. § 1.131 or otherwise, to establish that the reference(s) are not "prior art." Moreover, Applicants do not represent that a reference has been thoroughly reviewed or that any relevance of any portion of a reference is intended.

Consideration of the items listed is respectfully requested. Pursuant to the provisions of M.P.E.P. 609, it is requested that the Examiner return a copy of the attached Form 1449, marked as being considered and initialed by the Examiner, to the undersigned with the next official communication.

Please charge any additional fees or credit any overpayment to Deposit Account No. 13-2725.

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, Minnesota 55402-0903
(612) 332-5300

Date: 9/5/08

David G. Schmaltz
Reg. No. 39,828
DGS:PLSkaw

IPR2025-01119
Page 224 of 332
Belden EX1006

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 2316.2584USU2	Application Number: 12/182,705
	Applicant: KOWALCZYK ET AL.	
	Filing Date: 07/30/2008	Group Art Unit: UNKNOWN

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	4,913,369	04/03/1990	Lia et al.			
	5,638,481	06/10/1997	Arnett			
	5,987,203	11/16/1999	Abel et al.			
	6,220,413 B1	04/24/2001	Walters et al.			
	2004/0170369 A1	09/02/2004	Pons			
	2005/0213920 A1	09/29/2005	Tanaka et al.			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
	42 26 368 A1	02/10/1994	DE			Abstract	
	9-236709	09/09/1997	JP			Abstract	
	11-349230	12/21/1999	JP			Abstract	
	2005-73365	03/17/2005	JP			Abstract	
	2005-249858	09/15/2005	JP			Abstract	

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

		International Search Report and Written Opinion mailed August 8, 2008

23552
PATENT TRADEMARK OFFICE

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449) Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Derwent WPI
(c) 2008 Thomson Reuters. All rights reserved.

0006670971
WPI Acc no: 1994-049928/199407
Fibre-optic transmission line e.g. for connecting data processing systems between rooms in building - comprises preassembled terminal connectors, with optical fibres from cable distributed via divider supported by radial flange
Patent Assignee: OSI KOMMUNIKATIONS & SYSTEMTECHNIK GMBH (OSIK-N); SUHNER ELEKTRONIK GMBH (SUHN-N)
Inventor: NAR R; SPRING K; WIESMUELLER B

Patent Family (2 patents, 13 & countries)							
Patent Number	**Kind**	**Date**	**Application Number**	**Kind**	**Date**	**Update**	**Type**
DE 4226368	A1	19940210	DE 4226368	A	19920809	199407	B
EP 582744	A1	19940216	EP 1992115921	A	19920917	199407	E

Priority Applications (no., kind, date): DE 4226368 A 19920809

Patent Details						
Patent Number	**Kind**	**Lan**	**Pgs**	**Draw**	**Filing Notes**	
DE 4226368	A1	DE	11	5		
EP 582744	A1	DE	14	5		
Regional Designated States,Original	AT BE CH DE DK ES FR GB IT LI LU NL SE					

Alerting Abstract DE A1
The distribution and connection points a fibre=optic installation are spatially separated e.g. in different rooms of a building and the installations each have several banks or frames for receiving individual connection housings. A bundle of optical fibres combined in a cable feeds into each connection housing. The individual fibres in the bundle are connected to an adaptor on the front panel of the housing or a similar connection element.
The transmission line comprises a preassembled unit of the fibre-optic cable (1) and the connection housings (2) or connector elements fixedly connected to it. The fixed connection of the cable (1) to the connector housing(s) (2) or connection element(s) is formed by a divider (5). This is supported on one side by means of a radial flange (4) on one wall of the housing (2). On the other side the fixed cable filler (6) is fixedly fastened.
ADVANTAGE - Line is provided with prefabricated single connector unit at each end for simple on-site installation. Connector housings can be inserted from front or back.

Class Codes

International Patent Classification					
IPC	**Class Level**	**Scope**	**Position**	**Status**	**Version Date**
G02B-006/36; G02B-006/44			Main		"Version 7"
H04B-010/20			Secondary		"Version 7"

;
DWPI Class: T01; V04; V07; P81

(19) BUNDESREPUBLIK DEUTSCHLAND

DEUTSCHES PATENTAMT

(12) **Offenlegungsschrift**

(10) **DE 42 26 368 A 1**

(51) Int. Cl.[5]:
G 02 B 6/36
H 04 B 10/20
G 02 B 6/44

(21) Aktenzeichen: P 42 26 368.9
(22) Anmeldetag: 9. 8. 92
(43) Offenlegungstag: 10. 2. 94

DE 42 26 368 A 1

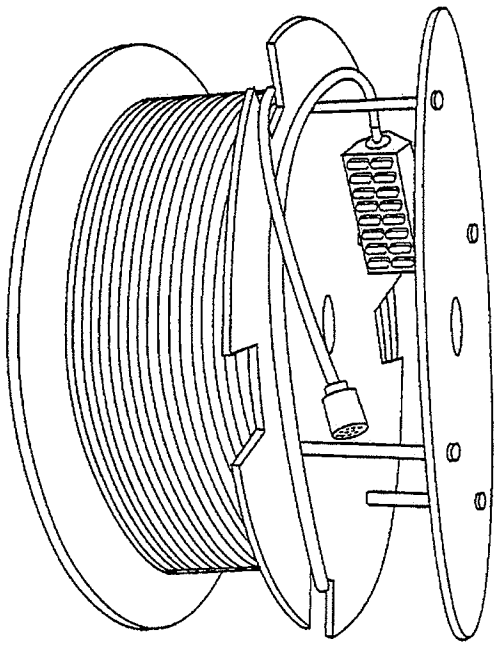
(71) Anmelder:
Suhner Elektronik GmbH, 82024 Taufkirchen, DE;
OSI Kommunikations- und Systemtechnik GmbH, 89335 Ichenhausen, DE

(74) Vertreter:
Schön, T., Pat.-Ing., 84164 Moosthenning

(72) Erfinder:
Nar, Reinhold, 8900 Augsburg, DE; Wiesmüller, Bernhard, 8351 Offenberg, DE; Spring, Karl-Heinz, 8871 Gundremmingen, DE

(54) Übertragungsstrecke für mit Lichtwellenleitern bestückte Anlagen

(57) Vorgestellt wird eine Ausgestaltung einer Übertragungsstrecke für mit Lichtwellenleitern bestückte Anlagen, deren Verteiler- und Verbindungsstellen räumlich voneinander getrennt, insbesondere in verschiedenen Räumen eines Gebäudes aufgestellt sind und aus jeweils eine Anzahl von einzelne Anschlußgehäuse aufnehmenden Schränken oder Gestellen bestehen, wobei in jedes der Anschlußgehäuse jeweils ein zu einem Kabel zusammengefaßtes Lichtwellenleiterbündel mündet und die einzelnen Lichtwellenleiter des Bündels innerhalb des Anschlußgehäuses aufgeteilt und mit an einer Frontplatte des Anschlußgehäuses angeordneten Anschlußadaptern oder dgl. Verbindungselementen verbunden sind, und die aus einer insgesamt vormontierten Einheit aus Lichtwellenleiterkabel und mit diesem zugefest verbundenen Anschlußgehäusen bzw. Verbindungselementen besteht.



DE 42 26 368 A 1

Die folgenden Angaben sind den vom Anmelder eingereichten Unterlagen entnommen

BUNDESDRUCKEREI 12. 93 308 066/386 11/61

Beschreibung

Die Erfindung bezieht sich auf eine Übertragungsstrecke für mit Lichtwellenleitern bestückte Anlagen, deren Verteiler- und Verbindungsstellen räumlich voneinander getrennt, insbesondere in verschiedenen Räumen eines Gebäudes aufgestellt, sind und aus jeweils eine Anzahl von einzelne Anschlußgehäuse aufnehmenden Schränken oder Gestellen bestehen, wobei in jedes der Anschlußgehäuse jeweils ein zu einem Kabel zusammengefaßtes Lichtwellenleiterbündel mündet und die einzelnen Lichtwellenleiter des Bündels innerhalb des Anschlußgehäuses aufgeteilt und mit an einer Frontplatte des Anschlußgehäuses angeordneten Anschlußadaptern oder dergl. Verbindungselementen verbunden sind.

Im Rahmen der Aufstellung moderner Datenverarbeitungssysteme ist es erforderlich einzelne Baugruppen des Gesamtsystemes, wie Zentrale und Nebenstellen, in verschiedenen Räumlichkeiten, z. B. eines Gebäudes, aufzustellen und untereinander vermittels entsprechender Leitungen zu verbinden, was gleichermalen für die bekannten elektronisch arbeitenden und daher vermittels elektrisch leitender Metalleitungen als auch für an sich gleichfalls bekannten mit Lichtwellen arbeitenden und demzufolge mittels Lichtwellenleiter miteinander zu verbindende Anlagen gilt.

Bei der Installation von mit Lichtwellen arbeitenden Datenverarbeitungssystemen ergeben sich aus den materialcharakteristischen Eigenschaften der üblicherweise aus Glasfasern bestehenden Lichtwellenleiter eine Reihe von Sonderproblemen, die im wesentlichen auf der vergleichsweise geringen Zugfestigkeit von Glasfasern und in Verbindung damit auch auf der hohen Knickempfindlichkeit von Glasfasern sowie der extremen Beeinflussung von Verbindungen von Lichtwellenleitern durch Umwelteinflüsse sowie den Besonderheiten der für die Glasfasern der Lichtwellenleiter anzuwendenden Arbeitsweise z. B. beim Verbinden der Glasfaser mit einem Kupplungsteil, z. B. einem Steckerteil, beruhen. Hinzu kommt noch die stark unterschiedliche Wärmedehnung zwischen Kunststoffen und Glasfasern, welche in Anbetracht der Bruchgefährlichkeit von Glasfasern besondere, bei Metalleitern nicht erforderliche, besondere Anordnungen voraussetzt.

In der bekannten und herkömmlichen Weise des Anschlusses von Lichtwellenleitern an Verteilereinrichtungen bzw. Verteilerschränke bzw. an in diese einsetzbare Anschlußgehäuse für ankommende und abgehende Lichtwellenleiter werden, wie dies z. B. aus der GB-PS 2 166 262 ersichtlich ist, die einzelnen in Form des Kabels gruppenweise in das Anschlußgehäuse eingeführten Lichtwellenleiter jeweils vor Ort über einen dem Ausgleich der Wärmedehnung dienenden Längenspeicher geführt und einzeln mit den jeweils zugehörigen Verbindungselementen verbunden, wozu es erforderlich ist jeden einzelnen der Lichtwellenleiter am Montageort mindestens im Anschlußbereich einzeln von seiner Umhüllung zu befreien und unter Anwendung der hierfür bekannten Techniken mit dem zugehörigen Verbindungselement zu koppeln, woraus ein erheblich Zeit- und Arbeitsaufwand des Monteurs vor Ort resultiert und woraus ferner erhebliche Probleme hinsichtlich der Sicherung der gesamten Datenverarbeitungsanlage gegen möglichen Mißbrauch resultieren, so daß nicht nur die Installation an sich, sondern zusätzlich auch noch die Sicherheitsüberwachung einen erheblichen Aufwand bedingen.

Der Erfindung liegt daher die Aufgabe zugrunde eine Übertragungsstrecke für mit Lichtwellenleitern arbeitende Anlagen deren einzelne Stationen räumlich voneinander getrennt und insbesondere in verschiedenen Räumen eines Gebäudes untergebracht sind, zu schaffen, welche insgesamt, d. h. beidendig mit allen Anschlußmitteln, werksseitig vorgefertigt und als vorgefertigte Einheit geliefert sowie vor Ort als komplett vormontierte Einheit installiert werden kann, in der Weise, daß vor Ort keinerlei Montagearbeiten mehr anfallen. Darüberhinaus ist es auch Ziel der Erfindung die Übertragungseinheit so auszubilden daß die Anschlußgehäuse in beliebiger Weise von dessen Vorder- oder Rückseite her in den Schrank bzw. das Regal eingesetzt werden können.

Diese Aufgabe wird erfindungsgemäß im Wesentlichen dadurch gelöst, daß die Übertragungsstrecke aus einer insgesamt vormontierten Einheit aus Lichtwellenleiterkabel und mit diesem zugfest verbundenen Anschlußgehäusen bzw. Verbindungselementen besteht, wobei die zugfeste Verbindung des Kabels mit dem oder den schalenförmigen Anschlußgehäuse(n) bzw. dem oder den Verbindungselement(en) durch einen Aufteiler gebildet ist, welcher einerseits vermittels eines radial gerichteten Flansches an einer der Stirnwandungen des Anschlußgehäuses bzw. des Verbindungselemetes abgestützt ist und in welchem andererseits die zugfeste Einlage des Kabels, insbesondere das sog. Keflar, zugfest festgelegt ist.

Eine solchermaßen aufgebaute Übertragungsstrecke kann samt aller erforderlichen Anschlußmittel werksseitig in einer solchen Weise vormontiert werden, daß zum einen vor Ort nur noch die Befestigung der Anschlußgehäuse in einem dafür vorgesehenen Schrank oder dergl. vorgenommen werden muß und daß zum anderen das jeweils in Installationsrichtung vorne liegende Anschlußgehäuse bzw. Verbindungselement lediglich in einer sog. Einziehverkappung aufgenommen werden muß, um die Übertragungsstrecke im Zuge deren Installation erforderlichenfalls durch Wandungs- oder Dekkendurchbrüche innerhalb des Gebäudes hindurchziehen zu können. Die erfindungsgemäße Verwendung eines als separates Bauteil herstellbaren und zugfest mit dem Lichtwellenleiterkabel verbindbaren sowie nach seiner Verbindung mit dem Kabel mit dem Anschlußgehäuse verbindbaren Aufteilers ermöglicht dabei vorteilhafterweise eine sehr raumsparende Ausbildung der Anschlußgehäuse, so daß die für die Installation der Übertragungsstrecke erforderlichen Wandungs- oder Deckendurchbrüche des Gebäudes lediglich einen vergleichsweise kleinen, insbesondere mittels eines rotierend arbeitenden Schneidwekzeuges herstellbaren Durchmesser aufzuweisen brauchen. Dies ergibt eine wesentliche Erhöhung der Funktionssicherheit aller Einzelanschlüsse der Übertragungsstrecke, da diese vor Auslieferung bzw. Installation werkseitig durchgemessen werden kann. Ferner erübrigt die erfindungsgemäß Ausbildung einer komplett vormontierten Übertragungsstrecke auch alle Montagearbeiten vor Ort, so daß für die Installation einer mit Lichtwellenleitern ausgestatteten Anlage vor Ort nur noch ein Bruchteil der bisher erforderlichen Monteur-Arbeitszeit anfällt und darüberhinaus alle die bisher aus Datenschutzgründen erforderlichen Sicherheitsvorkehrungen gegen einen möglichen Mißbrauch der Anlage entfallen können.

In einer bevorzugten Verwirklichungsform der Erfindung ist hinsichtlich der Ausbildung des die zugsichere Verbindung von Lichtwellenleiterkabel und Anschluß-

gehäuse vermittelnden Aufteilers vorgesehen, daß dieser aus einem Gehäuse mit einem zylindrischen Kabeleinführungsraum und einem kegelförmigen Aufteilerraum besteht, wobei im zylindrischen Kabeleinführungsraum eine vermittels Schrauben spannbare Klemmschelle zur möglichst zugfesten Festlegung des Kabelmantels insgesamt angeordnet ist. Über diese Einspannung des Kabelmantels wird ein gewisser Teil der beim Einziehen der Übertragungsstrecke vom Anschlußgehäuse auf das Kabel auszuübenden Zugkraft abgestützt Im Hinblick auf die Bruchempfindlichkeit der die Lichtwellenleiter bildenden Glasfasern ist die zulässigerweise maximal anwendbare Einspannkraft jedoch für eine Abstützung aller anzunehmenden Zugkräfte unzureichend, weshalb in weiterer Ausgestaltung vorgesehen ist, daß der kegelförmige Aufteilungsraum zum freien Ende des Aufteilers hin durch eine Lochplatte abgeschlossen ist, welche über einen umlaufenden Randsteg in eine entsprechend umlaufende Aufnahmenut im Gehäuse des Aufteilers eingreift und daß bei montierter Übertragungsstrecke eine zugkraftübertragende Einlage des Kabelmantels, ein sog. Keflar, zwischen dem Randsteg der Lochplatte und der Aufnahmenut des Gehäuses des Aufteilers klemmend eingespannt ist.

Zur problemlosen Aufteilung der einzelnen Lichtwellenleiter innerhalb des Aufteilungsraumes des Aufteilers enden sowohl der Kabelmantel des Lichtwellenleiterkabels als auch die Hüllrohre der einzelnen im Lichtwellenleiterkabel gebündelten Lichtwellenleiter im Bereich des Überganges zwischen dem zylindrischen Kabeleinführungsraum und dem kegelförmigen Aufteilungsraum, derart, daß die die Lichtwellenleiter bildenden Glasfasern innerhalb des Aufteilungsraumes freiliegend geführt und gegebenenfalls mit geringfügiger Überlänge versehen sind.

Im Anschluß an den Aufteiler sind die zugkraftentlasteten und an ihrem freien Ende mit Steckern ausgerüsteten Lichtwellenleiter innerhalb des Anschlußgehäuses wiederum in Hüllroheren aufgenommen, wozu im Einzelnen vorgesehen ist, daß die den bezüglich des Anschlußgehäuses innenliegenden Abschluß des Aufteilers bildende Lochplatte mit einer der Anzahl der Einzelleiter des Kabels entsprechenden Anzahl von in regelmäßigen Abständen zueinander angeordneten Lochdurchbrüchen versehen ist und daß an der Außenseite der Lochplatte in Verlängerung deren Lochdurchbrüche mittels Klebung oder Klemmung mit der Lochplatte verbundene Hüllrohre für die einzelnen Lichtwellenleiter angeschlossen sind.

Hinsichtlich der Ausgestaltung der Anschlußgehäuse ist in weiterer Ausgestaltung der Erfindung vorgesehen, daß diese jeweils aus einem im Wesentlichen schalenförmigen Gehäusekörper und einer dessen offene Seite übergreifenden Frontplatte bestehen, wobei der schalenförmige Gehäusekörper in Annäherung an eine teilkreisförmige Querschnittsform eine trapezförmige Querschnittsform besitzt und wenigstens eine zum Gehäuseinneren hin geneigt angeordnete Stirnwandung aufweist und daß der Aufteiler an der zum Gehäuse inneren hin geneigten Stirnwandung des Anschlußgehäuses befestigt ist. Eine von einer reinen Teilkreisform abweichende Querschnittsform dient der Ausbildung von Anlageflächen, über welche die Anschlußgehäuse in den zugehörigen Aufnahmen der sie aufnehmenden Schränke oder dergl. anliegen, so daß diese Formgebung bei entsprechender Gestaltung der Aufnahmen zugunsten der erfindungsgemäß auch bereits angestrebten und durch die Anwendung eines Aufteilers der vorgenannten Art grundsätzlich ermöglichten kleinvolumigen Bauweise der Anschlußgehäuse auch verlassen werden kann. Ein besonderer Vorteil ergibt sich aus der zum Gehäuse inneren hin geneigten Ausbildung der den Aufteiler tragenden Stirnwandung des Anschlußgehäuses dadurch, daß jeder scharfe Biegungswinkel des Lichtwellenleiterkabels vermieden wird.

An der die offene Seite des Anschlußgehäuses übergreifenden Frontplatte ist eine Vielzahl von Adaptern, insbesondere sog. Duplex-Adaptern angeordnet, welche jeweils eine mittels Verschraubung an der Frontplatte befestigte Durchführungskupplung und innenseitig eine Steckeraufnahme für an den freien Enden der einzelnen Lichtwellenleiter angeordnete Stecker aufweisen.

Eine besonders gut geeignete Vorrichtung zur Erleichterung der Installation der Übertragungsstrecke vor Ort und gleichzeitig zum beschädigungsfreien Transport der vorgefertigten Einheit besteht nach einem weiteren Merkmal der Erfindung darin, daß die Übertragungsstrecke eine vorgegebene Länge eines Lichtwellenleiterkabels mit beidendig in gleicher Weise angeschlossenen Anschlußgehäusen oder Verbindungseinrichtungen umfaßt und insgesamt in installationsgerechter Anordnung auf einem Transport- und Montageträger angeordnet ist, wobei der Transport- und Montageträger eine Kabeltrommel für die Kabellänge und seitlich zu dieser angeordnete, insbesondere durch eine zur Seitenwandung des Kabeltrommelabschnittes vermittels Abstandshalter im Abstand und deckungsgleich angeordnete Schutzplatte abgedeckte Aufnahmen bzw. Halterungen für die mit der Kabellänge verbundenen Anschlußgehäuse oder dergl. Verbindungselemente aufweist, und wobei ferner Kabeltrommelabschnitt und Schutzplatte mit einer zentralen Durchgangsausnehmung versehen sind. Diese Anordnung ermöglicht es die gesamte Übertragungsstrecke absolut beschädigungsgeschützt zu transportieren und vor Ort auf einer für Kabeltrommeln üblichen Abrollvorrichtung aufzunehmen, derart, daß die Übertragungsstrecke insgesamt wie ein übliches Kabel installiert werden kann, wozu es außerordentlich hilfreich ist, daß wenigstens das in Anschlußrichtung vorne liegende Anschlußgehäuse bzw. die entsprechende Verbindungseinrichtung eine dem Querschnitt eines mittels eines Bohrers oder dergl. rotierendem Werkzeug erstellbaren Durchgangsquerschnitt wenigstens annähernd angepaßte insbesondere trapezförmige Querschnittsform aufweist und gegebenenfalls bereits werksseitig in einer Einziehverkappung angeordnet sowie samt dieser an der Seitenwandung des Kabeltrommelabschnittes gehaltert ist. In Verbindung mit einer solchen Transport- und Installationsausrüstung kann dann weiter vorgesehen sein, daß den Anschlußgehäusen, wenigstens aber dem in Anschlußrichtung vorne liegenden Anschlußgehäuse, eine ihre Frontplatte übergreifende haubenartige Schutzabdeckung zugeordnet ist.

Für eine hinsichtlich sowohl der Montage als auch der Demontage am Schrank oder Gestell bzw. Regal zuträgliche Weiterbildung des Erfindungsgegenstandes sieht vor, daß für die Festlegung der Anschlußgehäuse in Verlängerung deren Frontplatte und zu dieser parallel ausgerichtet sowohl am Anschlußgehäuse als auch am Schrank oder Regal, insbesondere mittels Verschraubung, lösbar festlegbare Plattenelemente vorgesehen sind, wobei im Einzelnen zweckmäßigerweise vorgesehen ist, daß die Länge der einem Anschlußgehäuse zugeordneten Frontplatte kleiner ist als die die

lichte Länge des jeweiligen Anschlußgehäuses und daß die beiden einem Anschlußgehäuse zugeordneten Plattenelemente in ihrer montierten Lage in deren Verlängerung und in einer gemeinsamen Ebene mit der Frontplatte angeordnet sind. Dies ermöglicht es die Anschlußgehäuse bei deren Montage sowohl von deren Vorder-als auch von deren Rückseite her in die Schränke oder Regale einzusetzen bzw. aus diesen auszubauen.

Eine gegebenenfalls auch anwendbare Sonderform sieht dabei vor, daß an die Stirnseiten der Anschlußgehäuse mit diesen insbesondere lösbar verbundene Haltewinkel für deren Festlegung in einem Schrank oder einem Regal angeschlossen sind.

Die Erfindung ist in der nachfolgenden Beispielsbeschreibung anhand eines in der Zeichnung dargestellten Ausführungsbeispieles im Einzelnen beschrieben.

In der Zeichnung zeigt die

Fig. 1 eine teilweise aufgebrochene, schaubildliche Darstellung eines Anschlußgehäuses der Übertragungsstrecke;

Fig. 2 eine Explosionsdarstellung des Gehäuses eines Aufteilers;

Fig. 3 eine Schnittdarstellung des Aufteilers nach **Fig.** 2 bei montierten Lichtwellenleitern;

Fig. 4 eine schaubildliche Darstellung eines Transport- und Montageträgers für eine Übertragungsstrekke.

Fig. 5 eine teilweise aufgebrochene, schaubildliche Darstellung einer anderen Ausführungsform des Anschlußgehäuses der Übertragungsstrecke.

Die in der Zeichnung dargestellte Übertragungsstrekke besteht im Wesentlichen aus einer Länge eines Lichtwellenleiterkabels **1** und mit diesem zugfest verbundenen Anschlußgehäusen **2**, wobei die zugfeste Verbindung des Lichtwellenleiterkabels **1** mit dem einen oder den beiden Anschlußgehäusen **2** durch einen Aufteiler **5** gebildet ist, welcher vermittels eines radial gerichteten Flansches **4** an einer der Stirnwandungen **24** des Anschlußgehäuses **2** abgestützt ist und in welchem andererseits eine zugfeste Einlage **6** des Lichtwellenleiterkabels **1**, insbesondere ein sog. Keflar, zugfest festgelegt ist. Der im Allgemeinen mit **5** bezeichnete Aufteiler besteht aus einem Gehäuse mit einem zylindrischen Kabeleinführungsraum **7** und einem kegelförmigen Aufteilerraum **8**, wobei im Kabeleinführungsraum **7** eine vermittels Schrauben **9** spannbare Klemmschelle **10** zur Festlegung des Kabelmantels **11** insgesamt angeordnet ist. Der kegelförmige Aufteilerraum **8** ist zum freien Ende des Aufteilers **5** hin durch eine Lochplatte **12** abgeschlossen, welche über einen umlaufenden Randsteg **13** in eine entsprechend umlaufende Aufnahmenut **14** im Gehäuse des Aufteilers **5** eingreift, wobei bei montierter Übertragungsstrecke eine zugkraftübertragende Einlage **6** des Kabelmantels, ein sog. Keflar, zwischen dem Randsteg **13** der Lochplatte **12** und der Aufnahmenut **14** des Gehäuses des Aufteilers **5** klemmend eingespannt ist. Wie insbesondere aus der Darstellung der **Fig.** 3 ersichtlich enden sowohl der Kabelmantel **11** des Lichtwellenleiterkabels **1** als auch die Hüllrohre **16** der einzelnen im Lichtwellenleiterkabel **1** gebündelten Lichtwellenleiter **17** im Bereich des Überganges zwischen dem zylindrischen Kabeleinführungsraum **7** und dem kegelförmigen Aufteilerraum **8**, derart, daß die die Lichtwellenleiter bildenden Glasfasern **17** innerhalb des Aufteilerraumes **8** freiliegend geführt sind. Im Anschluß an den Aufteiler **5** sind die an ihrem freien Ende mit Steckern **18** ausgerüsteten Lichtwellenleiter innerhalb des Anschlußgehäuses **2** wiederum in Hüllrohren **19** aufgenommen. Die den bezüglich des Anschlußgehäuses **2** innenliegenden Abschluß des Aufteilers **5** bildende Lochplatte **12** mit einer der Anzahl der Einzelleiter **17** des Lichtwellenleiterkabels **1** entsprechenden Anzahl von in regelmäßigen Abständen zueinander angeordneten Lochdurchbrüchen **20** versehen ist und daß an der Außenseite der Lochplatte **12** in Verlängerung deren Lochdurchbrüche **20** mittels Klebung oder Klemmung mit der Lochplatte **12** verbundene Hüllrohre **19** für die einzelnen Lichtwellenleiter **17** angeschlossen sind. Der Aufteiler **5** besteht aus einem zweiteiligen Gehäuse, dessen beide Hälften **5a** und **5b** mittels Schrauben **5c** miteinander verbindbar sind.

Die Anschlußgehäuse **2** bestehen jeweils aus einem im Wesentlichen schalenförmigen Gehäusekörper **22** und einer dessen offene Seite übergreifenden Frontplatte **23**, wobei der schalenförmige Gehäusekörper **22** eine trapezförmige Querschnittsform besitzt und wenigstens eine zum Gehäuse inneren hin geneigt ausgerichtete Stirnwandung **24** aufweist, an der der Aufteiler **5** über seinen radial gerichten Flansch befestigt ist. An der die offene Seite des Anschlußgehäuses **2** übergreifenden Frontplatte **23** ist eine Vielzahl von Adaptern **25**, insbesondere sog. Duplex-Adaptern angeordnet, welche jeweils eine mittels Verschraubung **26** an der Frontplatte **23** befestigte Durchführungskupplung **27** und eine Steckeraufnahme **28** für die an den freien Enden der einzelnen Lichtwellenleiter **17** angeordnete Stecker **18** aufweisen.

Eine solchermaßen aufgebaute und samt aller erforderlichen Anschlußmittel werksseitig vormontierte Übertragungsstrecke kann im Zuge ihrer Installation vor Ort ohne weiteres einfach durch Wandungs- oder Deckendurchbrüche innerhalb des Gebäudes hindurchgezogen werden, so daß sich Montagearbeiten vor Ort nur noch die Befestigung der Anschlußgehäuse in einem dafür vorgesehenen Schrank oder dergl. beschränken. Hierzu und zum Schutz vor Beschädigung während des Transportes ist die Übertragungsstrecke insgesamt und in installationsgerechter Anordnung auf einem aus der Darstellung der **Fig.** 4 ersichtlichen Transport- und Montageträger **30** angeordnet, welcher eine Kabeltrommel **31** für die Kabellänge **1** und seitlich zu dieser angeordnete, insbesondere durch eine zur Seitenwandung **32** des Kabeltrommelabschnittes **31** vermittels Abstandshalter **33** im Abstand und deckungsgleich angeordnete Schutzplatte **34** abgedeckte Aufnahmen bzw. Halterungen **35** für die mit der Kabellänge **1** verbundenen Anschlußgehäuse **2** aufweist, und welcher zur Aufnahme auf einem Abrollgestell oder dergl. Einrichtung mit einer zentralen Durchgangsausnehmung **36** versehen ist. Dem in Installationsrichtung vorne liegenden Anschlußgehäuse **2**, ist eine seine Frontplatte übegreifende haubenartige Schutzabdeckung **37** zugeordnet.

Für eine erleichterte Montage bzw. Demontage an Schrank oder Regal sind in beidseitiger Verlängerung der Frontplatte des Anschlußgehäuses Plattenelemente **44** vorgesehen, die sowohl mit der Frontseite des Anschlußgehäuses als auch mit den zugehörigen Aufnahme- bzw. Halteleisten des Schrankes bzw. Regales verschraubbar sind, in der Weise, daß die Anschlußgehäuse wahlweise von deren Vorder- oder deren Hinterseite her in den Schrank bzw. das Regal eingesetzt und dort befestigt werden können.

Zur Montage bzw. Festlegung der Anschlußgehäuse im Schrank bzw. Regal kann aber auch vorgesehen sein, daß mit ihrem einen Schenkel in Verlängerung der Frontplatte der Anschlußgehäuse ausgerichtete, an die

Stirnwandungen der Anschlußgehäuse 2 anschließbare, mit diesen insbesondere lösbar, verbundene Haltewinkel 40 angeordnet.

Patentansprüche

1. Übertragungsstrecke für mit Lichtwellenleitern bestückte Anlagen, deren Verteiler- und Verbindungsstellen räumlich voneinander getrennt, insbesondere in verschiedenen Räumen eines Gebäudes aufgestellt, sind und aus jeweils eine Anzahl von einzelne Anschlußgehäuse aufnehmenden Schränken oder Gestellen bestehen, wobei in jedes der Anschlußgehäuse jeweils ein zu einem Kabel zusammengefaßtes Lichtwellenleiterbündel mündet und die einzelnen Lichtwellenleiter des Bündels innerhalb des Anschlußgehäuses aufgeteilt und mit an einer Frontplatte des Anschlußgehäuses angeordneten Anschlußadaptern oder dergl. Verbindungselemente verbunden sind, **dadurch gekennzeichnet,** daß sie aus einer insgesamt vormontierten Einheit aus Lichtwellenleiterkabel (1) und mit diesem zugfest verbundenen Anschlußgehäusen (2) bzw. Verbindungselementen besteht, wobei die zugfeste Verbindung des (1) Kabels mit dem oder den schalenförmigen Anschlußgehäuse(n) (2) bzw. dem oder den Verbindungselement(en) durch einen Aufteiler (5) gebildet ist, welcher einerseits vermittels eines radial gerichteten Flansches (4) an einer der Stirnwandungen des Anschlußgehäuses (2) bzw. des Verbindungselementes abgestützt ist und in welchem andererseits die zugfeste Einlage (6) des Kabels (1), Keflar, zugfest festgelegt ist.

2. Übertragungsstrecke nach Anspruch 1, dadurch gekennzeichnet, daß der Aufteiler (5) aus einem Gehäuse mit einem zylindrischen Kabeleinführungsraum (8) und einem kegelförmigen Aufteilerraum (8) besteht.

3. Übertragungsstrecke nach Anspruch 1 und 2, dadurch gekennzeichnet, daß im zylindrischen Kabeleinführungsraum (7) eine vermittels Schrauben (9) spannbare Klemmschelle (10) zur möglichst zugfesten Festlegung des Kabelmantels (11) insgesamt angeordnet ist.

4. Übertragungsstrecke nach Anspruch 1 bis 3, dadurch gekennzeichnet, daß der kegelförmige Aufteilungsraum (8) zum freien Ende des Aufteilers (5) hin durch eine Lochplatte (12) abgeschlossen ist, welche über einen umlaufenden Randsteg (13) in eine entsprechend umlaufende Aufnahmenut (14) im Gehäuse des Aufteilers (5) eingreift und daß bei montierter Übertragungsstrecke eine zugkraftübertragende Einlage (6) des Kabelmantels, ein sog. Keflar, zwischen dem Randsteg (13) der Lochplatte (12) und der Aufnahmenut (14) des Gehäuses des Aufteilers (5) klemmend eingespannt ist.

5. Übertragungsstrecke nach Anspruch 1 bis 4, dadurch gekennzeichnet, daß der Kabelmantel (11) im Bereich des Überganges zwischen dem zylindrischen (7) und dem kegelförmigen (8) Raum endet.

6. Übertragungsstrecke nach Anspruch 1 bis 5, dadurch gekennzeichnet, daß die Hüllrohre (16) bildenden Kunststoffummantelungen der einzelnen Lichtwellenleiter (17) des Kabels (1) im Bereich deren Eintrittes in den kegelförmigen Aufteilerraum (8) enden.

7. Übertragungsstrecke nach Anspruch 1 bis 6, dadurch gekennzeichnet, daß die Lochplatte (12) mit einer der Anzahl der Einzelleiter (17) des Kabels (1) entsprechenden Anzahl von in regelmäßigen Abständen zueinander angeordneten Lochdurchbrüchen (20) versehen ist und daß an der Außenseite der Lochplatte (12) in Verlängerung deren Lochdurchbrüche (20) mittels Klebung oder Klemmung mit der Lochplatte (12) verbundene Hüllrohre (19) für die einzelnen Lichtwellenleiter (17) angeschlossen sind.

8. Übertragungsstrecke nach Anspruch 1 bis 7, dadurch gekennzeichnet, daß das Gehäuse des Aufteilers (5) insgesamt aus zwei miteinander über Verbindungsschrauben (5c) miteinander verbundenen bzw. verbindbaren und zueinander weitgehend identisch ausgebildeten Hälften (5a und 5b) besteht.

9. Übertragungsstrecke nach Anspruch 1 bis 8, dadurch gekennzeichnet, daß die Anschlußgehäuse (2) jeweils aus einem im Wesentlichen schalenförmigen Gehäusekörper (22) und einer dessen offene Seite übergreifenden Frontplatte (23) bestehen, wobei der schalenförmige Gehäusekörper (22) in Annäherung an eine teilkreisförmige Querschnittsform eine trapezförmige Querschnittsform besitzt und wenigstens eine zum Gehäuse inneren hin geneigt angeordnete Stirnwandung (24) aufweist und daß der Aufteiler (5) an der zum Gehäuseinneren hin geneigten Stirnwandung (24) des Anschlußgehäuses (2) befestigt ist.

10. Übertragungsstrecke nach Anspruch 1 bis 8, dadurch gekennzeichnet, daß an der die offene Seite des Anschlußgehäuses (2) übergreifenden Frontplatte (23) eine Vielzahl von Adaptern, insbesondere sog. Dupplex-Adaptern (26) angeordnet ist, welche jeweils eine mittels Verschraubung an der Frontplatte (23) befestigte Durchführungskupplung (27) und innenseitig eine Steckeraufnahme für an den freien Enden der einzelnen Lichtwellenleiter (17) angeordnete Stecker (18) aufweisen.

11. Übertragungsstrecke nach Anspruch 1 bis 10, dadurch gekennzeichnet, daß sie eine vorgegebene Länge eines Lichtwellenleiterkabels mit beidendig in gleicher Weise angeschlossenen Anschlußgehäusen oder Verbindungseinrichtungen umfaßt und insgesamt in installationsgerechter Anordnung auf einem Transport- und Montageträger angeordnet ist.

12. Übertragungsstrecke nach Anspruch 1 bis 11, dadurch gekennzeichnet, daß der Transport- und Montageträger eine Kabeltrommel für die Kabellänge und seitlich zu dieser angeordnete, insbesondere durch eine zur Seitenwandung des Kabeltrommelabschnittes vermittels Abstandshalter im Abstand und deckungsgleich angeordnete Schutzplatte abgedeckte Aufnahmen bzw. Halterungen für die mit der Kabellänge verbundenen Anschlußgehäuse oder dergl. Verbindungselemente aufweist, wobei Kabeltrommelabschnitt und Schutzplatte mit einer zentralen Durchgangsausnehmung versehen sind.

13. Übertragungsstrecke nach Anspruch 1 bis 12, dadurch gekennzeichnet, daß wenigstens das in Anschlußrichtung vorne liegende Anschlußgehäuse bzw. die entsprechende Verbindungseinrichtung eine dem Querschnitt eines mittels eines Bohrers oder dergl. rotierendem Werkzeug erstellbaren Durchgangsquerschnitt wenigstens annähernd angepaßte insbesondere trapezförmige Querschnittsform aufweist und gegebenenfalls bereits werkssei-

tig in einer Einziehverkappung angeordnet sowie samt dieser an der Seitenwandung des Kabeltrommelabschnittes gehaltert ist.

14. Übertragungsstrecke nach Anspruch 1 bis 13, dadurch gekennzeichnet, daß den Anschlußgehäusen (2), wenigstens aber dem in Anschlußrichtung vorne liegenden Anschlußgehäuse, eine ihre Frontplatte (23) übergreifende haubenartige Schutzabdeckung (37) zugeordnet ist.

15. Übertragungsstrecke nach Anspruch 1 bis 14, dadurch gekennzeichnet, daß an die Stirnseiten der Anschlußgehäuse (2) mit diesen insbesondere lösbar verbundene Haltewinkel (4) für deren Festlegung in einem Schrank oder einem Regal angeschlossen sind.

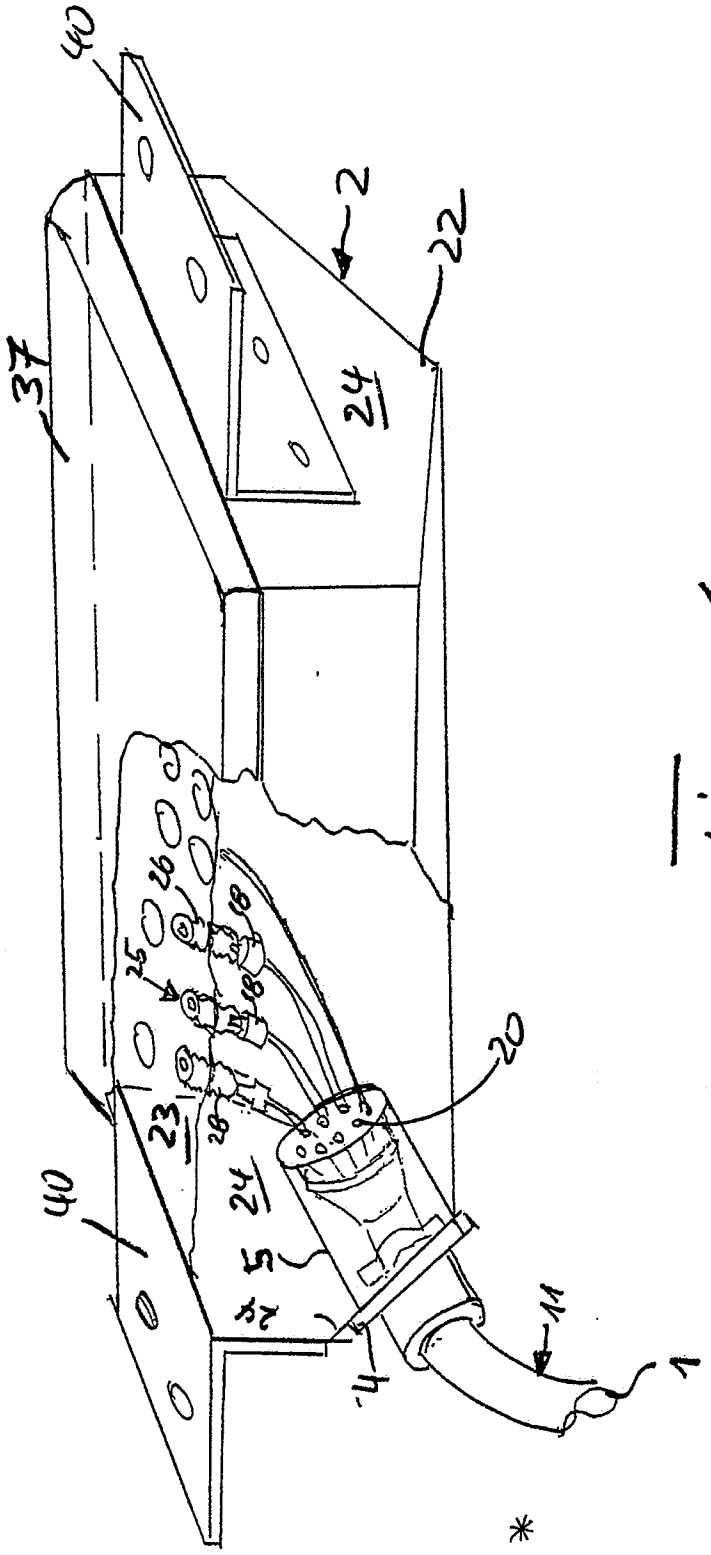
16. Übertragungsstrecke nach Anspruch 1 bis 14, dadurch gekennzeichnet, daß für die Festlegung der Anschlußgehäuse (2) in Verlängerung deren Frontplatte (23) und zu dieser parallel ausgerichtet bzw. fluchtend sowohl am Anschlußgehäuse (2) als auch am Schrank oder Regal, insbesondere mittels Verschraubung, lösbar festlegbare Plattenelemente (44) vorgesehen sind.

17. Übertragungsstrecke nach Anspruch 16, dadurch gekennzeichnet, daß die Länge der einem Anschlußgehäuse (2) zugeordneten Frontplatte (23) kleiner ist als die die lichte Länge des jeweiligen Anschlußgehäuses (2) und daß die beiden einem Anschlußgehäuse zugeordneten Plattenelemente (44) in ihrer montierten Lage in deren Verlängerung und in einer gemeinsamen Ebene mit der Frontplatte (23) angeordnet sind.

Hierzu 5 Seite(n) Zeichnungen

– Leerseite –

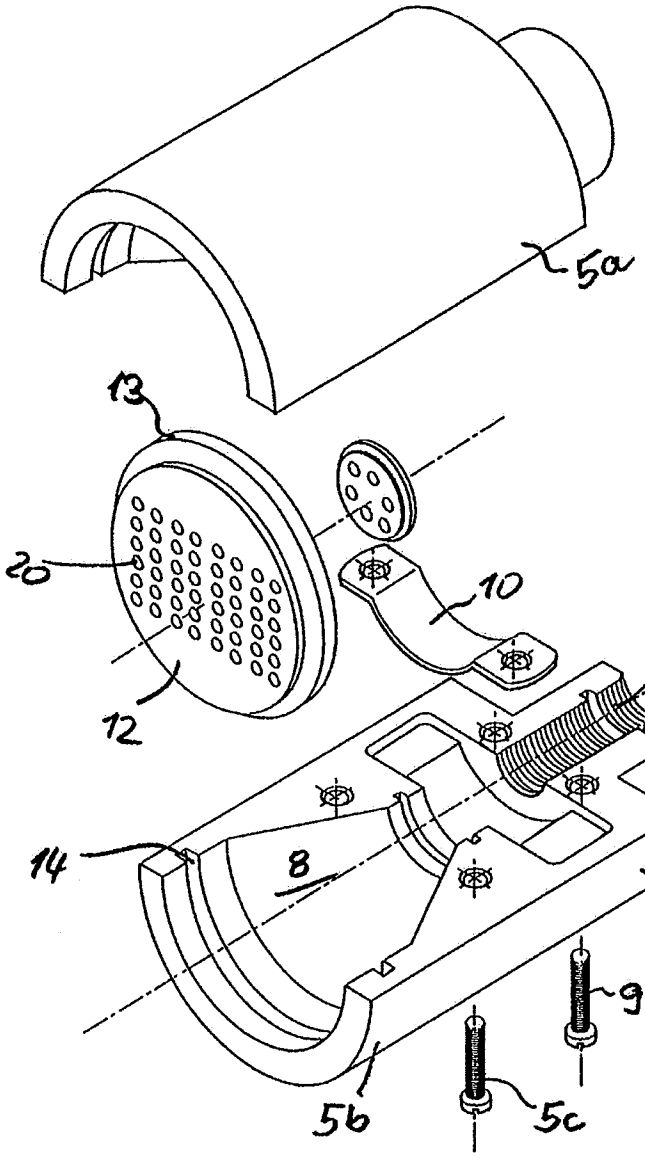
Nummer: DE 42 26 368 A1
Int. Cl.[5]: G 02 B 6/36
Offenlegungstag: 10. Februar 1994



Figur 1

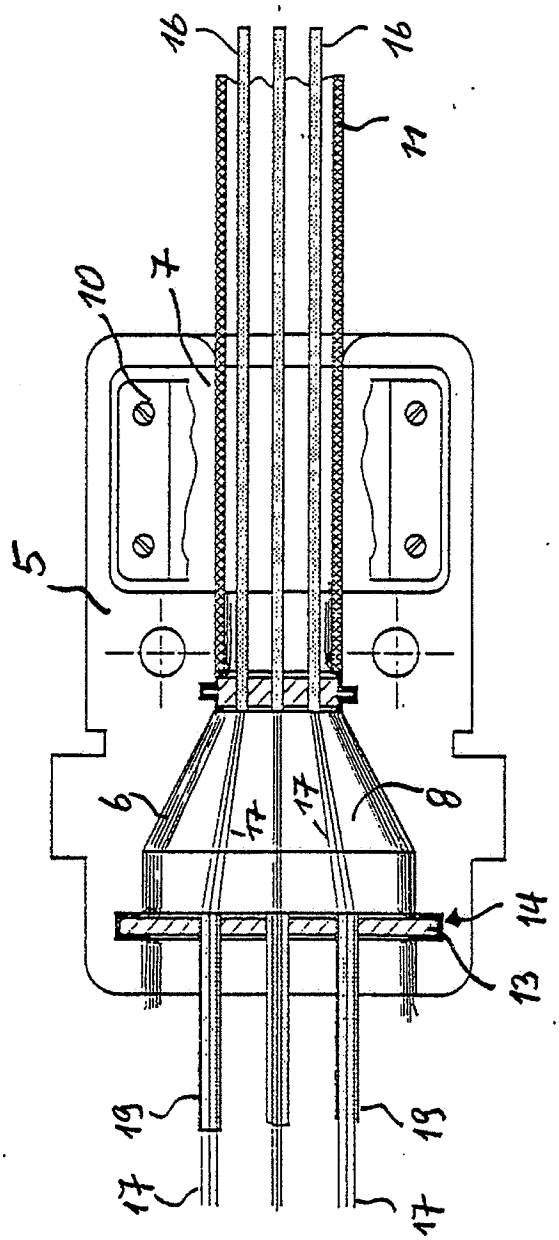
308 066/386

Nummer: DE 42 26 368 A1
Int. Cl.[5]: G 02 B 6/36
Offenlegungstag: 10. Februar 1994



Figur 2

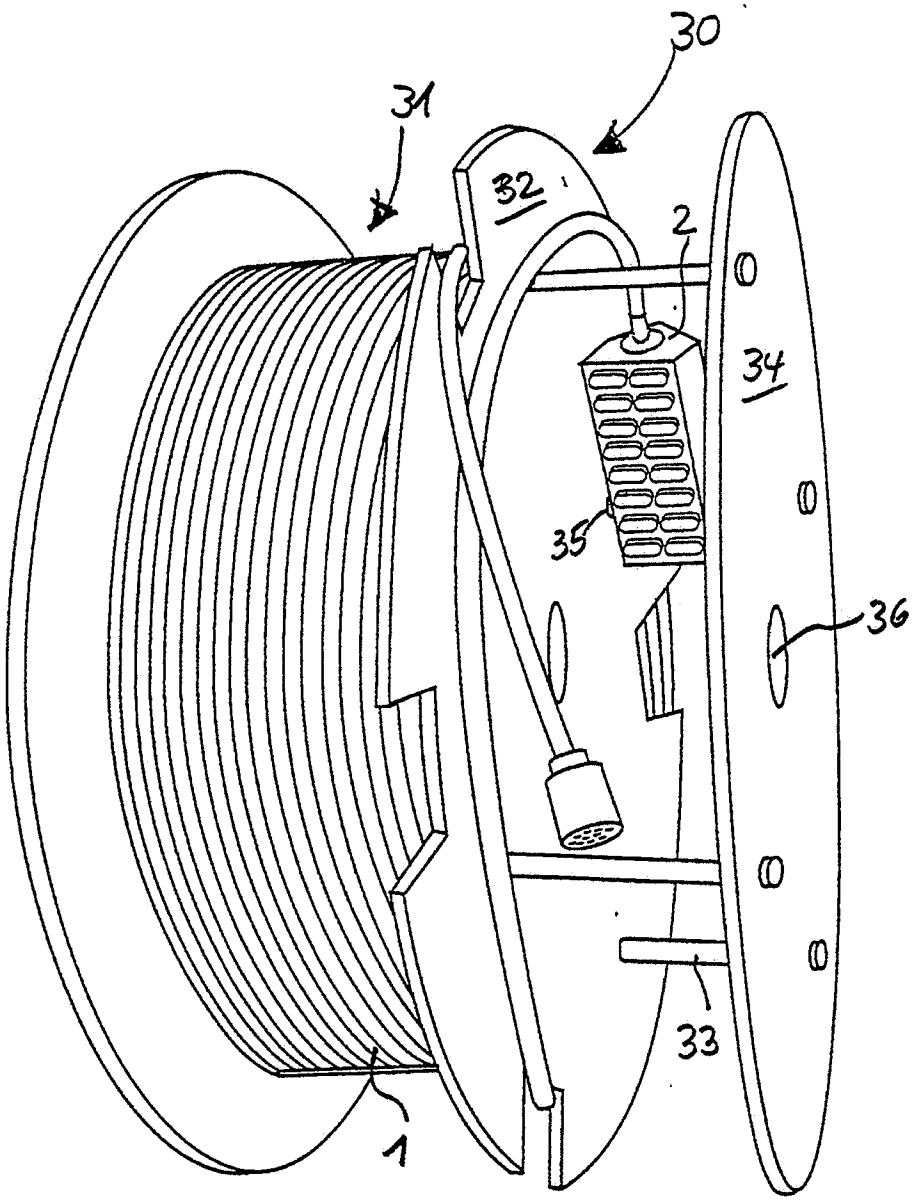
Nummer: DE 42 26 368 A1
Int. Cl.[5]: G 02 B 6/36
Offenlegungstag: 10. Februar 1994



Figur 3

308 066/386

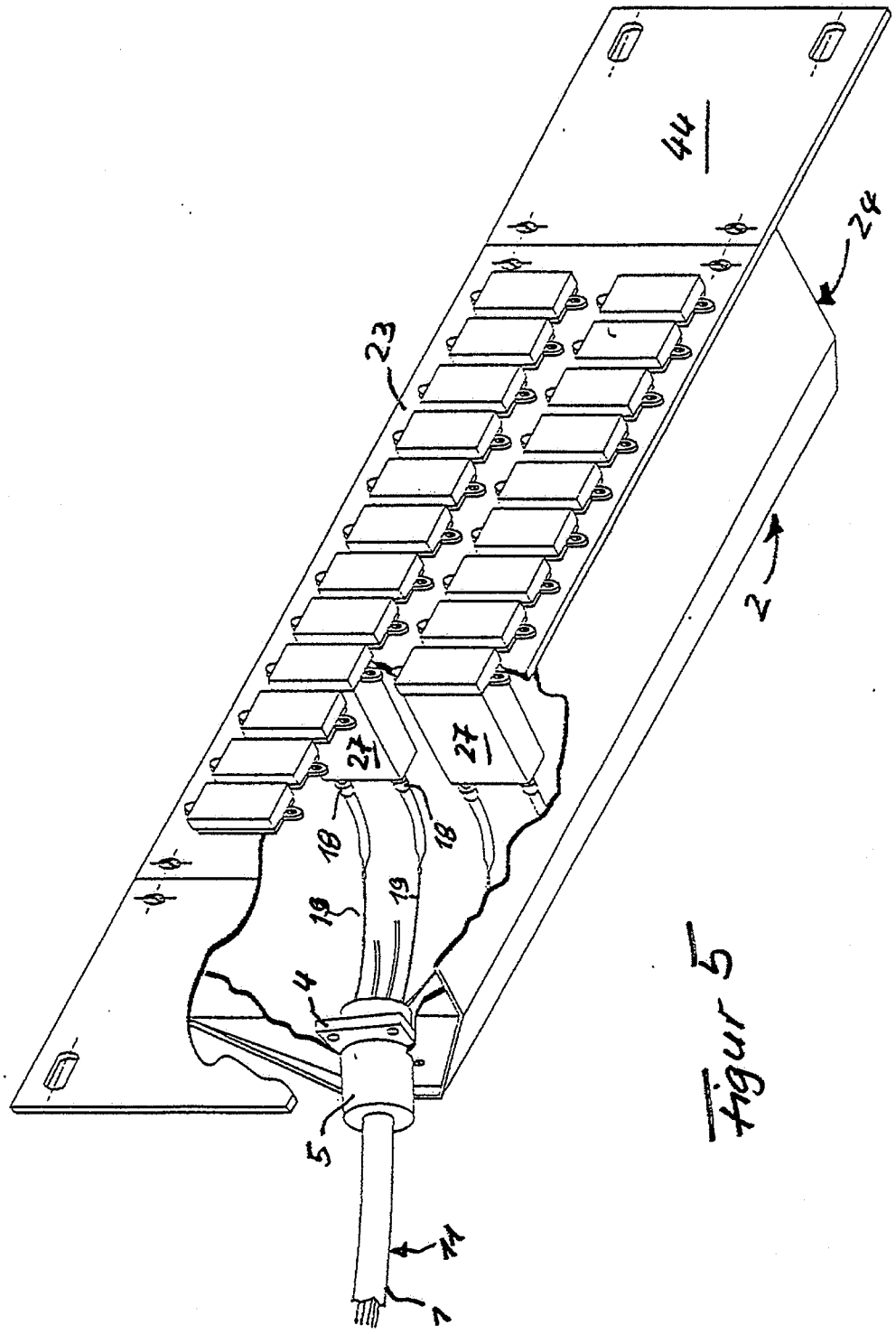
Nummer: DE 42 26 368 A1
Int. Cl.[5]: G 02 B 6/36
Offenlegungstag: 10. Februar 1994



Figur 4

308 066/386

Nummer: DE 42 26 368 A1
Int. Cl.[5]: G 02 B 6/36
Offenlegungstag: 10. Februar 1994



Figur 5

308 066/386

Patent Abstracts of Japan

PUBLICATION NUMBER : 09236709
PUBLICATION DATE : 09-09-97

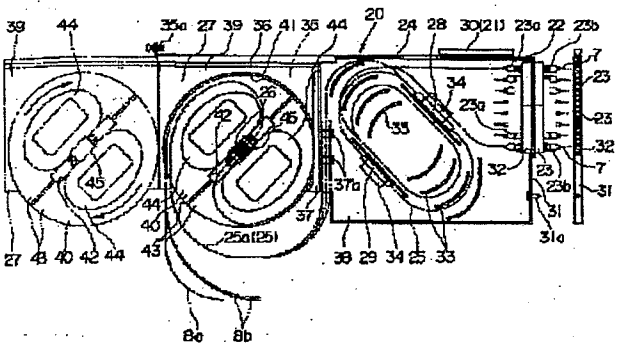
APPLICATION DATE : 28-02-96
APPLICATION NUMBER : 08041886

APPLICANT : NIPPON TELEGR & TELEPH CORP <NTT>;

INVENTOR : EBIHARA TAKASHI;

INT.CL. : G02B 6/00

TITLE : OPTICAL BRANCHING MODULE



ABSTRACT : PROBLEM TO BE SOLVED: To improve the packaging density and to reduce the adverse effect on an optical communication during a work such as a connection switching by providing a moveable extra-length storage section from which a connection extra-length is pulled out as a pulled extra-length while it is separated from a main body.

SOLUTION: In order to switch the connection at an MT connector 26 in the optical branching module stored in a frame, a moveable extra-length storage section 27 is pulled out to the outer side of the station with respect to a main body 24, an MT connector 26 is taken out with optical fiber tapes 8a, 8b and 25, which are connected to the connector 26, and the switching work is executed. Since a circular plate 40 is made rotative with respect to a circular recessed part 41, the plate 40 rotates as the section 27 is pulled out and a connection extra-length 25a of the tape 25, which is wound outside a mandrel 44, is rewound and functions as a pulled out extra-length. Since the re-wound extra-length 25a is restrained by a cord restraining jig 37a, the work is accomplished without giving an adverse effect to the optical parts in the body 24.

COPYRIGHT: (C)1997,JPO

(19)日本国特許庁（ＪＰ）　(12)**公開特許公報（Ａ）**　(11)特許出願公開番号

特開平9－236709

(43)公開日　平成９年(1997)９月９日

(51)Int.Cl.[6]	識別記号	庁内整理番号	ＦＩ		技術表示箇所
Ｇ０２Ｂ　6/00	３３６		Ｇ０２Ｂ　6/00	３３６	

審査請求　未請求　請求項の数１　ＯＬ　（全 ７ 頁）

(21)出願番号　特願平8－41886

(22)出願日　平成８年(1996)２月28日

(71)出願人　000005186
株式会社フジクラ
東京都江東区木場１丁目５番１号

(71)出願人　000004226
日本電信電話株式会社
東京都新宿区西新宿三丁目19番２号

(72)発明者　百津　仁博
千葉県佐倉市六崎1440番地　株式会社フジクラ佐倉工場内

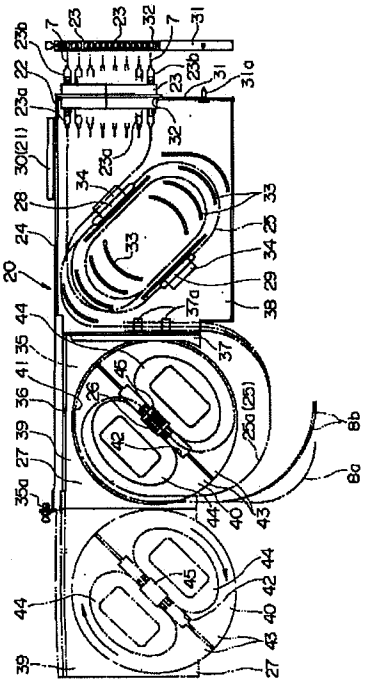
(72)発明者　後藤　茂則
千葉県佐倉市六崎1440番地　株式会社フジクラ佐倉工場内

(74)代理人　弁理士　志賀　正武

最終頁に続く

(54)【発明の名称】　光分岐モジュール

(57)【要約】
【課題】　設置や取り出し作業に鑑みて実装密度の向上が困難であった。活線状態において光通信に影響を与えることなく接続切り替え等の作業を行うことが困難であった。
【解決手段】　一端部２２に分岐接続用光コネクタ２３を支持し、内部に途中に光カプラ２８が介在された光ファイバテープ２５を複数本収納する薄板状の本体２４と、光ファイバテープ８ａ、８ｂと光ファイバテープ２５とを切り替え可能に接続するＭＴコネクタ２６およびその接続余長２５ａを収納し、本体２４の前記分岐接続用光コネクタ２３と対向する端部において出没自在に設けられ、本体２４から離間した際に接続余長２５ａが引出余長として引き出される可動余長収納部２７とを備えている。



【特許請求の範囲】
【請求項1】　多心の光ファイバ（8a、8b）を光コネクタ接続により光ファイバ心線（7）へ分岐接続するための光分岐モジュール（20）であって、分岐接続用光コネクタ（23）を一端部（22）に支持し、途中に光カプラ（28）が介在された光ファイバ（25）を内部に収納する本体（24）と、光ファイバ同士を切り替え可能に接続する切替用コネクタ（26）およびその接続余長（25a）を収納し、本体の前記分岐接続用光コネクタと対向する端部において出没自在に設けられ、本体から離間した際に接続余長が引出余長として引き出される可動余長収納部（27）とを備えることを特徴とする光分岐モジュール。
【発明の詳細な説明】
【0001】
【発明の属する技術分野】本発明は、通信用の光心線に試験光を挿入するための光分岐モジュールに関するものである。
【0002】
【従来の技術】光ファイバネットワークにおいて、例えば、光ケーブルを光コネクタ接続により光ファイバ心線へ分岐接続するには、多数の局内外光ファイバを成端して大群構成とする光配線架が使用される。特に加入者系伝送路に用いられる光配線架としては、FTM（Fiber Termination Module）が用いられる。図3および図4は、FTMに適用された従来の光配線架を示す図であり、図中、符号1はフレーム、2は端子板、3は光コネクタ、4は光分岐モジュールである。
【0003】前記フレーム1は、水平に配置された仕切板5によって等間隔の複数段に仕切られた棚状に形成されており、前記光分岐モジュール4を収納する段が複数段形成されている。このフレーム1の各段の同一側開口部には、該開口部を略覆う端子板2が固定されている。この端子板2には前記光コネクタ3の取り付け用の穴6が複数並べて連設され、この穴6内に周知のSC形の光コネクタ3が2個づつ配置・固定されている。この光コネクタ3は、外側に局内光ファイバ心線7が接続される図示しないSC形端子が複数配置され、内側に局外光ファイバ心線が接続される図示しない複数のSC形端子が前記局内光ファイバ心線7用の端子に対応する位置に配置されている。
【0004】以下、光分岐モジュール4の基本構成を図7に示す。図7に示すように、光分岐モジュール4内には、光カプラ9、光フィルタ4d、および光ファイバ4cを切り替え接続するための光コネクタ10等の光部品が収納される。光線路の試験・管理を行うには、まず、試験対象となる心線を収納する光分岐モジュールを心線選択装置4aにて選択し、光パルス試験装置4bから送出された試験光（光パルス）を、光カプラ9を経由して測定対象となる局外側の光ファイバ4cへ送出し、さらに、当該光ファイバ4cで発生する後方散乱光を光カプラ9を経由して光パルス試験装置4bの受光部で受光し、次いで、受光された後方散乱光の波形を解析することにより光線路の損失異常をモニタする。
【0005】図5、図6に沿って、従来の4心用分岐モジュールについて説明すれば、この光分岐モジュールは、全体として薄板状のパッケージであり、図示しない開閉蓋により開閉可能である。光分岐モジュール4の後面側（図5、図6左側）には、局外光ケーブル（成端ケーブル）Kから導出された4心光ファイバテープ8aと、心線選択装置から導出された1本の8心光ファイバテープ8bが導入される。光分岐モジュール4内には、4個のファイバ形光カプラ9が収納されており、心線選択装置側の光ファイバテープ8bは、8心MTコネクタ10により、光カプラ9側の8心光ファイバテープに接続される。
【0006】次に、局外光ケーブル（成端ケーブル）側の光ファイバテープ8aは、4心MTコネクタ10により、光カプラ9側の光ファイバテープ（図示せず）に接続される。一方、光カプラ9の局内側のポートから導出される1本の4心光ファイバテープは、光コード8wとしてパッケージ外部へ導出され、さらに、側板に固定された多心単心分岐器Fにて単心光ファイバ8yへ分岐される。分岐された各単心光ファイバ8yの先端は、SC形プラグへ成端されており、フレーム1の端子板2に固定されたSC形光アダプタ3へ接続される。
【0007】この光分岐モジュール4は、前記フレーム1の各段に、例えば13．5mm幅で、一段に50個程度設けられる。光分岐モジュール4の内部には、光コード8wと、該光コード8wに接続された光カプラ9と、光ファイバテープ8a、8bと光コード8wとを接続切り替え可能に光接続するMTコネクタ10（Mechanically Transferable）とが収納されている。光分岐モジュール4の収納時に上側となる側部には、フレーム1の各段の上部に架設された吊り下げレール11から吊り下げるための吊り下げ部材12が取り付けられている。
【0008】
【発明が解決しようとする課題】ところで、前記のような光分岐モジュール4の場合、部品点数が多い上、収容心線数の増大や実装密度の高度化の要求に鑑みて各段に十分な広さが確保されていないため、狭隘な空間において光コネクタ3等の光部品の取付作業を行なわねばならず、作業性が極めて悪かった。また、特定の1個の光分岐モジュール4の交換においても、その光分岐モジュール4の近傍の光分岐モジュール4も取り外して作業者の手が入る程度の空間を確保する必要があり、光配線架の高密度化に伴い作業に困難をきたすようになってきた。
【0009】すなわち、心線の切り替えに際して光分岐

モジュール４内に収納されたＭＴコネクタ１０を切り替えるために光ファイバ切替接続システムを使用する場合には、図６に示すように、該当の光分岐モジュール４をフレーム１から引き出して棚に載置し、引き出した光分岐モジュール４内を開放して、内部からＭＴコネクタ１０を引き出すが、光分岐モジュール４内のＭＴコネクタ１０の引き出し時には、光コード８ｗなどに接続されている前記光カプラ９やフィルタ等（図示せず）の光部品まで一緒に引き出すこととなり、活線状態では光通信に影響を与えることなく作業を行うことが困難になっていた。

【００１０】前記光配線架にあっては、収容心線数の増大に伴いさらなる実装密度の向上の要求があるが、前述した光分岐モジュール４を引き出すための各光分岐モジュール間の空間やＭＴコネクタ１０で接続切り替えするための作業場所を確保する必要があるため、実装密度の向上には限界があった。

【００１１】本発明は、前述の課題に鑑みてなされたもので、光分岐モジュールを載置するような引出用の作業スペースを削減して実装密度を向上することができるとともに、接続切り替え等の作業時に光通信に与える影響を可及的に軽減することができる光分岐モジュールを提供することを目的とするものである。

【００１２】

【課題を解決するための手段】本発明の光分岐モジュールでは、分岐接続用光コネクタを一端部に支持し、途中に光カプラが介在された光ファイバを内部に収納する本体と、光ファイバ同士を切り替え可能に接続する切替用コネクタおよびその接続余長を収納し、本体の前記分岐接続用光コネクタと対向する端部において出没自在に設けられ、本体から離間した際に接続余長が引出余長として引き出される可動余長収納部とを備えることを前記課題の解決手段とした。本発明の光分岐モジュールの作用としては、本体に対して可動余長収納部を引き出して、切替用光コネクタの切り替え作業や、可動余長収納部内の他の光部品の交換やメンテナンスを行なう。こうすることにより、本体を引き出す必要が無いので、本体内の光部品や隣設された光分岐モジュール内の光部品に影響を与えること無く作業を行なえるとともに、引き出した切替用光コネクタの再収納も容易である。また、可動余長収納部を本体に対して引き出した場合には、可動余長収納部から引き出された光ファイバが引出余長として機能する。

【００１３】

【発明の実施の形態】以下本発明の第１の実施の形態を、図１および図２を参照して説明する。図中符号２０は本実施の形態の光分岐モジュールである。図中、前記図３から図７と同一の構成部分には同一の符号を付し、その説明を簡略化する。光分岐モジュール２０は、図３および図４記載の前記フレーム１に収納されるものである。

【００１４】前記光分岐モジュール２０は、図１および図２に示すように、支持手段２１を介してフレーム１内の定位置に支持可能に構成され、該支持時にフレーム１外側に臨む一端部２２に局内装置側への分岐接続用光コネクタ２３が設置され、該分岐接続用光コネクタ２３に接続された４心または８心の複数本の光ファイバテープ２５（多心光ファイバ）および該光ファイバテープ２５の途中に介在された光カプラ２８や分岐部２９等の光部品を内部に収納する薄板状の本体２４と、光ケーブルＫから導出された光ファイバテープ８ａ、８ｂ（光ファイバ）と光ファイバテープ２５とを切り替え可能に接続する切替用コネクタとしてのＭＴコネクタ２６およびその接続余長２５ａを収納し、本体２４の前記分岐接続用光コネクタ２３と対向する端部において出没自在に設けられ、本体２４から離間した際に接続余長２５ａが引き出されて引出余長として機能する可動余長収納部２７とを備えている。

【００１５】前記本体２４は、プラスチック等の軽量な素材からなり、外面視長方形板状の有底角筒体である。この本体２４の長方形の短辺方向の一側端面の前記分岐接続用コネクタ２３寄りの部分には、前記支持手段２１として吊具３０（２１）が取り付けられている。この吊具３０は、フレーム１における光分岐モジュール２０を配置する段の上段の仕切板５に設けた図示しない係合部に局外側（図１左側）から係合することにより、本体２４を所定の向き（端子板２に対して垂直、かつ仕切板５に対して垂直）な平面内に位置決めする。なお、吊具３０の位置は、図示したものに限られない。また、支持手段２１としては、前記吊具３０以外、本体２４を前記所定の向きに位置決め可能なものであれば、他の構成であってもよい。

【００１６】本体２４の一端部２２には、分岐接続用コネクタ２３を支持するための端面板３１が設けられている。この端面板３１の上部（図１上側）には、コネクタ支持穴３２が開口されている。このコネクタ支持穴３２には、分岐接続用コネクタ２３が光ファイバ心線同士を光接続する接続軸線を端面板３１と垂直として嵌め込まれている。端面板３１の局内側端面には、フレーム１に挿入した光分岐モジュール２０が前記吊具３０を中心として揺動することを防止する振れ止めピン３１ａが突設されている。

【００１７】分岐接続用コネクタ２３は、位置決め用リングスリーブが内蔵された多心ＳＣ形の光アダプタであって、分岐部２９によって単心分岐された光ファイバテープ２５の先端を成端するＳＣプラグ２３ａが着脱されるようになっている。分岐部２９は、光カプラ２８から出た光ファイバテープ２５に単心光ファイバを融着して多心単心分岐するようになっている。分岐接続用コネクタ２３には、局内側光ファイバ心線７を成端するＳＣプ

ラグ２３ｂが外側から挿抜可能に差し込まれるようになっている。光カプラ２８は、基板導波路型であって、光フィルタを内蔵している。

【００１８】本体２４の内壁面には、前記光ファイバテープ２５の余長を規定以上の半径を維持して湾曲させて収納するための半径維持突起３３が複数突設されている。これら半径維持突起３３は、光ファイバテープ２５を規定以上の半径で湾曲可能な程度の半径で湾曲された円弧状のフランジであって、本体２４の内壁面において一列に連設されている。これら半径維持突起３３が連設領域の両側方には、光カプラ２８や分岐部２９を支持するための光部品支持部３４が設けられている。

【００１９】本体２４の局外側端部には、前記可動余長収納部２７をガイドして本体２４に対して本体２４の長手方向に沿ってスライド移動自在とするガイド部３５が突設されている。このガイド部３５は、本体２４の断面方向一側部を本体２４の局外側に突出させた部分である。このガイド部３５の上端部（図１上側）には、可動余長収納部２７に設けられた図示しない係合部と係合して可動余長収納部２７を吊下げた状態でスライド移動自在に支持し、ガイド部３５の局外側において出没可能とするレール３６が設けられている。

【００２０】ガイド部３５の基端部には、可動余長収納部２７の局内側への移動を規制する規制板３７が設けられている。この規制板３７は、本体２４の長手方向略中央部に位置し、本体２４の厚さ方向に延在して、本体２４に光ファイバテープ２５の余長を収納可能な余長収納部３８を画成している。規制板３７の余長収納部３８側には、光ファイバテープ２５を引き留めるコード引留具３７ａが取り付けられている。

【００２１】ガイド部３５の局外側端部には、本体２４をフレーム１の局外側から局内側に向けて挿入した際に本体２４をその挿入方向において位置決めする樹脂製の位置決め部材３５ａが突設されている。位置決め部材３５ａは、本体２４をフレーム１に挿入した際に、先端がフレーム１の図示しない止め穴に挿入されることにより、本体２４をフレーム１に対して位置決めするようになっている。止め穴に挿入された位置決め部材３５ａは、止め穴にさらに押し込むことにより先端が拡径して、フレーム１に対して仮留めされるようになっている。位置決め部材３５ａは、フレーム１内に挿入された本体２４をフレーム１の局外側に引き出すための引き出しつまみとしても利用することができる。

【００２２】前記可動余長収納部２７は、前記ガイド部３５のレール３６に移動自在として吊り下げられた長方形状の基板３９と、この基板３９の中央部において基板３９に垂直な軸線を以て回動自在に設けられた正円形の円板４０とを備えている。基板３９は、前記ガイド部３５に収納可能な大きさの長方形板であって、中央部に前記円板４０を回動自在として収納することができる円形凹部４１を有している。円板４０は、直径方向に延在する溝４２を介して互いに突き合わせ状態になっている２つの半円部４３を有している。各半円部４３の中央部には、その外側に巻装された光ファイバテープ８ａ、８ｂの湾曲半径を維持する略楕円形のマンドレル４４が膨出されている。各半円部４３は、円形凹部４１の内周面とマンドレル４４の外周面との間に光ファイバテープ８ａ、８ｂを規定以上の湾曲半径を維持して収納するようになっている。前記溝４２の中央部には、前記ＭＴコネクタ２６を挟持して支持するためのコネクタ支持部４５が設けられている。

【００２３】なお、円板４０は、基板３９の円形凹部４１に円板４０の外周面の半分以上が覆われ、しかも、外周面が円形凹部４１の内周面とそれぞれ周方向に延在する図示しない突条と溝とで凹凸係合されているので、円形凹部４１から脱落することはない。円板４０の下部は、円形凹部４１の開放された下方に露出されているので、この露出した部分を利用して光ファイバテープ８ａ、８ｂを容易に巻装できるようになっている。また、円板４０に巻装された光ファイバテープ８ａ、８ｂは、円板４０の外面側に着脱自在に装着された蓋４０ａによって、円板４０の外方に突出しないように収められている。円板４０は、正円形以外、楕円形等であってもよい。また、円板４０と円形凹部４１とは、相対回転の範囲が設定された形状であっても構わない。

【００２４】図示した光分岐モジュール２０にあっては、それぞれコード化された１本の光ファイバテープ８ａと２本の光ファイバテープ８ｂとが導入されている。これら光ファイバテープ８ａ、８ｂは、４心または８心のＭＴコネクタ２６を介してそれぞれ同一心数の光ファイバテープ２５と切り替え可能に接続されている。ＭＴコネクタ２６をコネクタ支持部４５に支持した際に生じる光ファイバテープ２５の接続余長２５ａは、マンドレル４４の外周面に巻回されて可動余長収納部２７内に収納されている。光ファイバテープ２５は３本を要する。また、ＭＴコネクタ２６は３個要する。これらＭＴコネクタ２６のいずれにも、光ファイバテープ２５が接続されている。

【００２５】光ファイバテープ２５は、余長収納部３８内において、半径維持突起３３によって規定以上の湾曲半径で湾曲されて収納され、その途中において介在した光カプラ２８や分岐部２９を経て、前記分岐接続用コネクタ２３を介して局内光ファイバ心線７と切り替え可能に接続されている。前記分岐接続用コネクタ２３としては、４心のものが２連として用いられている。

【００２６】本発明の光分岐モジュールは、局外側から導入された複数本の光ファイバテープ８ａ、８ｂを可動余長収納部２７において前記ＭＴコネクタ２６を介して光ファイバテープ２５と切り替え可能に接続するとともに、前記光ファイバテープ２５の単心分岐した先端を接

続した分岐接続用コネクタ２３を介して局内光ファイバ心線７と切り替え可能に接続し、光ファイバテープ２５の余長を余長収納部３８内に規定以上の湾曲半径を維持して収納し、光分岐モジュール２０をフレーム１の適切位置に収納する。また、光ファイバテープ２５のＭＴコネクタ２６における接続余長２５ａをマンドレル４４の外周部に巻装して収納する。

【００２７】フレーム１に収納した光分岐モジュール２０において、ＭＴコネクタ２６での接続を切り替えるには、可動余長収納部２７を本体２４に対して局外側に引き出してＭＴコネクタ２６を該ＭＴコネクタ２６に接続されている光ファイバテープ８ａ、８ｂ、２５ごと取り出し、切り替え作業を行なう。この際、円板４０は、円形凹部４１に対して回転可能になっているので、可動余長収納部２７の引き出しに伴って回転してマンドレル４４外側に巻装されている光ファイバテープ２５の接続余長２５ａが巻き出され、引出余長として機能する。巻き出された接続余長２５ａは、コード引留具３７ａによって引き留められているので、本体２４内に収納されている光ファイバテープ２５に引張力が作用することが無く、本体２４内の光部品に影響を与えることなく効率良く作業を行なうことができる。

【００２８】ＭＴコネクタ２６を再収納する際には、円板４０を回転することにより、ＭＴコネクタ２６に接続されている光ファイバテープ８ａ、８ｂ、２５の余長をマンドレル４４の外周面に巻装する。こうすることにより、各光ファイバテープ８ａ、８ｂ、２５同士が絡むことなく、効率良く再収納することができる。また、分岐接続用コネクタ２３において、局内光ファイバ心線７を差し替えるか、光分岐モジュール２０をフレーム１から引き出して光ファイバテープ２５のＳＣプラグ２３ａを分岐接続用コネクタ２３に対して差し替える。さらに、光分岐モジュール２０をフレーム１に対して挿抜するには、位置決め部材３５ａを利用して光分岐モジュール２０をフレーム１に対して移動する。

【００２９】したがって、本発明の光分岐モジュール２０によれば、複数本の光ファイバテープ８ａ、８ｂ、２５を省スペースで収納することができるので、実装密度が向上するとともに、可動余長収納部２７を本体２４に対して引き出し、再収納するだけで光ファイバテープ８ａ、８ｂ、２５の余長やＭＴコネクタ２６等の光部品を一体的に引き出し、再収納でき、ＭＴコネクタ２６における接続切り替え時には本体２４を引き出す必要が無いので、本体２４内の光部品や隣設された光分岐モジュール２０内の光部品に影響を与えること無く作業を行なえるとともに、引き出した光部品の再収納も容易である。この結果、光ファイバテープ８ａ、８ｂと光ファイバテープ２５との接続切り替えを、活線状態のまま行なうことが可能となる。

【００３０】また、局外側に引き出し可能な可動余長収納部２７において回転自在の円板４０を採用したことにより、可動余長収納部２７の引出余長を収納するスペースの設置が不要であり、フレーム１の奥行き方向の寸法を縮小することができ、光ファイバテープ８ａ、８ｂ、２５や分岐接続用コネクタ２３の実装密度が一層向上する。加えて、光配線架において隣設した光分岐モジュール２０間に接続切替用の作業スペースを確保する必要が無いので、光分岐モジュール２０同士を接近させて設置することができ、光配線架における光分岐モジュール２０の実装密度が向上して、より多心の光ケーブルＫに対応することができる光配線架を提供することができる。

【００３１】なお、本発明の光分岐モジュールは、光配線架以外、光配線盤や光成端箱等にも適用することができる。

【００３２】

【発明の効果】以上説明したように、本発明の光分岐モジュールによれば、分岐接続用光コネクタを一端部に支持し、途中に光カプラが介在された光ファイバを内部に収納する本体と、光ファイバ同士を切り替え可能に接続する切替用コネクタおよびその接続余長を収納し、本体の前記分岐接続用光コネクタと対向する端部において出没自在に設けられ、本体から離間した際に接続余長が引出余長として引き出される可動余長収納部とを備え、本体において複数本の光ファイバを省スペースで収納することができるので、実装密度が向上するとともに、可動余長収納部を本体に対して出没させるだけで光ファイバの余長や切替用コネクタ等の光部品を一体的に引き出せて、切替用コネクタにおける接続切り替え時には本体を引き出す必要が無いので、本体内の光カプラ等の光部品や隣設された光分岐モジュール内の光部品に影響を与えること無く接続切り替え作業を行なうことができ、しかも引き出した光部品の再収納が容易になるといった優れた効果を奏する。

【図面の簡単な説明】

【図１】　本発明の光分岐モジュールの実施の形態を示す側断面図である。

【図２】　図１の光分岐モジュールを示す斜視図である。

【図３】　光配線架を示す側面図である。

【図４】　光配線架を示す正面図である。

【図５】　従来の光分岐モジュールを示す側面図である。

【図６】　従来の光分岐モジュールを示す図であって、ＭＴコネクタでの接続切り替えを示す側面図である。

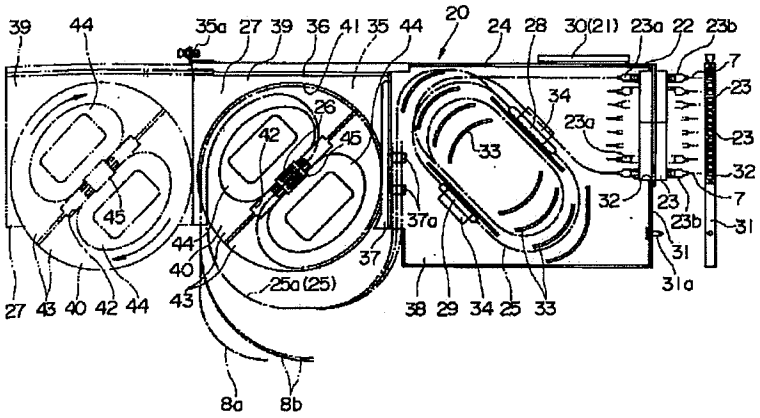
【図７】　光分岐モジュールの基本構成を示す略図である。

【符号の説明】

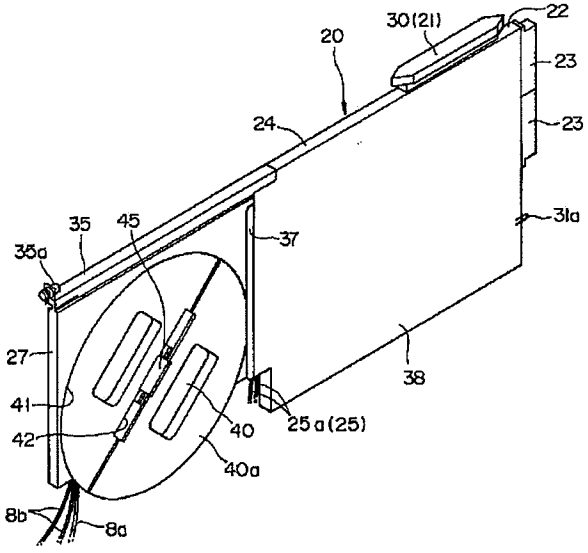
１…フレーム、７…光ファイバ心線（局内光ファイバ心線）、８…光ファイバテープ、２０…光分岐モジュール、２１…支持手段、２２…端部、２３…分岐接続用コ

ネクタ、２４…本体、２５…光ファイバテープ、２５ａ…接続余長、２６…切替用コネクタ（ＭＴコネクタ）、２７…可動余長収納部、２８…光カプラ、３０…支持手段（吊具）、Ｋ…光ケーブル。

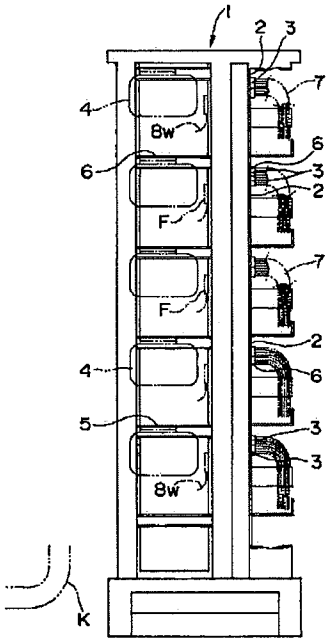
【図１】



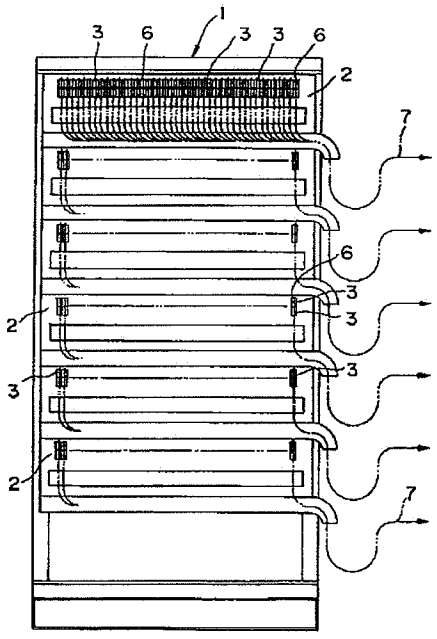
【図２】



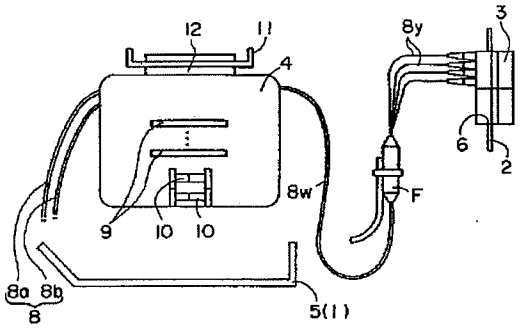
【図３】



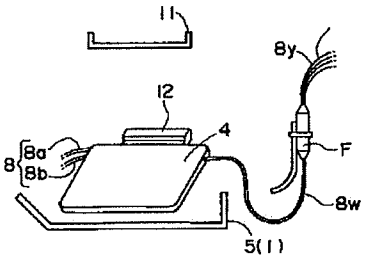
【図４】



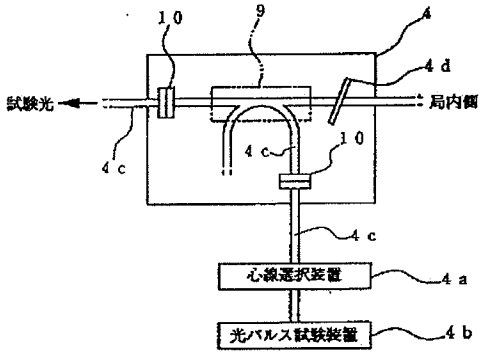
【図5】



【図6】



【図7】



フロントページの続き

(72)発明者　野村　義和
千葉県佐倉市六崎1440番地　株式会社フジクラ佐倉工場内
(72)発明者　美馬　隆司
東京都新宿区西新宿３丁目19番２号　日本電信電話株式会社内
(72)発明者　黒岩　真人
東京都新宿区西新宿３丁目19番２号　日本電信電話株式会社内
(72)発明者　中尾　直樹
東京都新宿区西新宿３丁目19番２号　日本電信電話株式会社内
(72)発明者　海老原　孝
東京都新宿区西新宿３丁目19番２号　日本電信電話株式会社内

EUROPEAN PATENT OFFICE

Patent Abstracts of Japan

PUBLICATION NUMBER : 11349230
PUBLICATION DATE : 21-12-99

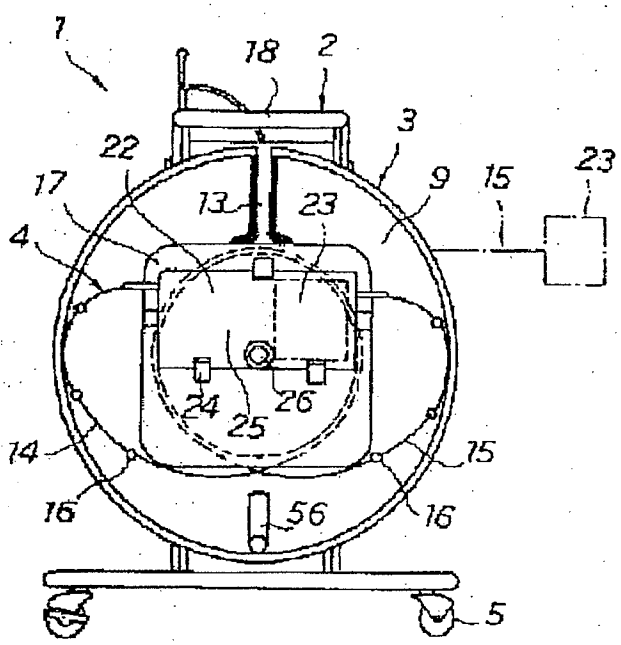
APPLICATION DATE : 09-06-98
APPLICATION NUMBER : 10161074

APPLICANT : HOKKAIDO SOGO TSUSHINMO KK;

INVENTOR : EZAKI MIKIO;

INT.CL. : B65H 75/14 H02G 7/20 H02G 11/02

TITLE : OPTICAL CABLE REEL AND METHOD FOR TEMPORARILY MOUNTING OPTICAL CABLE USING IT



ABSTRACT : PROBLEM TO BE SOLVED: To reduce manufacturing costs and maintenance costs as well as to avoid leaving on the ground.

SOLUTION: The optical cable reel 1 is provided with a band and can be mounted on a structure such as an electric light pole. Instead of a conventional connector, a terminal side connector box 22 is provided on a terminal part 14 of an optical cable 4, and a tip side connector box 23 is provided at a tip part 15. The tip side connector box 23 is taken out from the terminal side connector box 22 in extending the optical cable, and it is housed in the terminal side connector box 22 in connecting to the terminal side connector box 22. The connection is performed by using a terminal side connector and a tip side connector provided on respective boxes.

COPYRIGHT: (C)1999,JPO

(19)日本国特許庁（ＪＰ）　(12)公開特許公報（Ａ）　(11)特許出願公開番号
特開平11－349230
(43)公開日　平成11年(1999)12月21日

(51)Int.Cl.[6]	識別記号	ＦＩ	
Ｂ６５Ｈ　75/14		Ｂ６５Ｈ　75/14	Ｚ
Ｈ０２Ｇ　7/20		Ｈ０２Ｇ　7/20	Ｚ
11/02		11/02	Ｑ

審査請求　未請求　請求項の数5　ＯＬ　（全７頁）

(21)出願番号　特願平10－161074

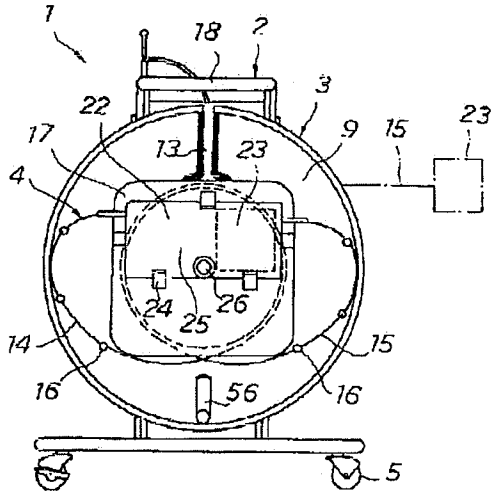
(22)出願日　平成10年(1998)６月９日

(71)出願人　000005120
日立電線株式会社
東京都千代田区丸の内二丁目１番２号
(71)出願人　598076007
北海道総合通信網株式会社
北海道札幌市中央区北１条東２丁目５番３号
(72)発明者　石川　優
茨城県日立市砂沢町880番地　日立電線株式会社高砂工場内
(74)代理人　弁理士　絹谷　信雄

最終頁に続く

(54)【発明の名称】　光ケーブルリール及びこれを用いた光ケーブルの仮設方法

(57)【要約】
【課題】　地上等への放置を避けると共に、製作費、メンテナンス費を安価とする。
【解決手段】　本発明に係る光ケーブルリール１はバンドを具備し、電柱等の構造物に取り付け可能である。また従来のコネクタに代わり、光ケーブル４の末端部１４に末端側コネクタボックス２２を、先端部１５に先端側コネクタボックス２３を備える。先端側コネクタボックス２３は、光ケーブルの延線時に末端側コネクタボックス２２から取出され、末端側コネクタボックス２２との接続時に末端側コネクタボックス２２内に収納される。これらの接続は各ボックスに設けられた末端側コネクタ及び先端側コネクタを用いて行う。



【特許請求の範囲】
【請求項１】　フレームに回転自在に設けられたドラムと、ドラムに巻回された光ケーブルと、光ケーブルの末端部に取り付けられた末端側コネクタボックスと、フレーム及び末端側コネクタボックスに少なくとも２本ずつ設けられ、電柱等の構造物への取り付けに使用するバンドと、末端側コネクタボックスをドラムの前面に着脱自在に固定するための固定部材と、光ケーブルの先端部に取り付けられ、末端側コネクタボックス内に取出し可能に収納される先端側コネクタボックスと、末端側コネクタボックス内に設けられ、光ケーブルの末端部に接続された末端側コネクタと、先端側コネクタボックスに出入れ自在に設けられ、光ケーブルの先端部に接続され且つ末端側コネクタと接続可能な先端側コネクタとを備えたことを特徴とする光ケーブルリール。
【請求項２】　上記フレーム及び末端側コネクタボックスに、上記構造物への取付状態において水平方向に離間して構造物に当接する少なくとも２つの脚部が設けられる請求項１記載の光ケーブルリール。
【請求項３】　上記ドラムの前方のツバ部が、ドラムの光ケーブル巻回部分を延線側と末端余長側とに仕切り、且つ、光ケーブルを通過させるためのスリットを有する請求項１又は２記載の光ケーブルリール。
【請求項４】　末端側コネクタが、末端側コネクタボックス内で光ケーブルの末端に接続された末端側接続用心線の先端に設けられ、先端側コネクタが、先端側コネクタボックス内で光ケーブルの先端に接続された先端側接続用心線の先端に設けられ、これら末端側コネクタ及び先端側コネクタの先端面上で、末端側接続用心線及び先端側接続用心線の先端面が面一に露出され、末端側コネクタ及び先端側コネクタが互いに先端面同士で突き合わせ接続可能とされる請求項１乃至３いずれかに記載の光ケーブルリール。
【請求項５】　請求項１乃至４いずれかに記載の光ケーブルリールを用いた光ケーブルの仮設方法であって、末端側コネクタボックスをドラムに取り付けた状態で先端側コネクタボックスを末端側コネクタボックスから取出し、その先端側コネクタボックスごと光ケーブルの先端側をドラムから所定位置まで繰出し、フレームをバンドにより構造物に取付けた後、末端側コネクタボックスをドラムから外してバンドにより構造物に取付け、末端側コネクタボックス内の末端側コネクタに別の先端側コネクタを接続し、先端側コネクタボックスの露出された先端側コネクタに別の末端側コネクタ又は機器を接続することを特徴とする光ケーブルの仮設方法。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明は、光ケーブルリール及びこれを用いた光ケーブルの仮設方法に関するものである。
【０００２】
【従来の技術】仮設移動用として共架電柱などの支障移転や各種イベント会場への仮提供、ゴルフ場におけるゴルフプレイのITV 光画像伝送をするための光伝送路の確保等のため、光ケーブルリールによる仮設を行うことが知られている。
【０００３】従来の光ケーブルリールは図１０に示すように、フレーム８１に回転自在にドラム８２を設け、ドラム８２に図１１に示すような比較的長い（500m程度）光ケーブル８３を巻回させている。光ケーブル８３の両端には雄雌のコネクタ８４，８５が一体に設けられる。
【０００４】図１２に示すように、コネクタ８４，８５は多芯一括型で、光ケーブル８３の複数の心線８６を同時に接続・離脱できるようになっている。心線８６は１本ずつフェルール８７内に固定され、フェルール８７の先端面上で面一に露出される。雄コネクタ８４のフェルール８７は先端側に突出され、雌コネクタ８５のフェルール８７の先端は割スリーブ８８内の引っ込んだ位置にある。雄コネクタ８４のフェルール８７を割スリーブ８８内に挿入し、雄コネクタ８４の雌ねじリング８９を雌コネクタ８５の雄ねじ部９０に締め込んでいけば、両コネクタ８４，８５のスプリング９１がフェルール８７同士を押し付け合い、両心線８６を光学的に接続することができる。なおこのような接続は、リールを直列接続するときやリールを機器に接続するときに行われる。
【０００５】
【発明が解決しようとする課題】ところで、従来の光ケーブルリールは、キャスタ９２により地上を走行移動できるものの、地上等に置いて使うのが一般的で、歩行等の邪魔になることが多かった。しかも、リールにケーブルを残した状態で長期間放置することも多く、信頼性等の点で問題があった。
【０００６】また、前述の多芯一括コネクタ８４，８５は大変高価でありながら、例えばフェルール８７の１本が不具合を生じたときに全体を分解して修理しなければならない。また狭い場所にフェルール８７が凸状又は凹状に密に並べられた構造なので、清掃がしにくく、１２芯等の多芯の場合、特に雌コネクタ８５の心線８６の先端面が清掃しにくかった。
【０００７】さらに心線８６の先端面が１芯でも傷付いた場合、長さ合わせのため、全芯段剥きからやり直して修理しなければならず、繁雑であった。
【０００８】一方、光ケーブルは、リールの運搬が容易となるよう軽量にするのが望ましい。従来は光ファイバ心線とともにケブラなどの高張力繊維を縦添えしてシースを施している。しかし、この構造でも、側圧や引張り張力に対しては強度が不十分であった。
【０００９】そして、図１３に示すようにコネクタ８４，８５を電柱９３に紐９４で縛り付けることもあるが、コネクタ８４，８５が電柱９３に１点しか当たらな

いため、ふらつき易く、強固に固定するのが難しかった。

【００１０】

【課題を解決するための手段】本発明に係る光ケーブルリールは、フレームに回転自在に設けられたドラムと、ドラムに巻回された光ケーブルと、光ケーブルの末端部に取り付けられた末端側コネクタボックスと、フレーム及び末端側コネクタボックスに少なくとも２本ずつ設けられ、電柱等の構造物への取り付けに使用するバンドと、末端側コネクタボックスをドラムの前面に着脱自在に固定するための固定部材と、光ケーブルの先端部に取り付けられ、末端側コネクタボックス内に取出し可能に収納される先端側コネクタボックスと、末端側コネクタボックス内に設けられ、光ケーブルの末端部に接続された末端側コネクタと、先端側コネクタボックスに出入れ自在に設けられ、光ケーブルの先端部に接続され且つ末端側コネクタと接続可能な先端側コネクタとを備えたものである。

【００１１】ここで、上記フレーム及び末端側コネクタボックスに、上記構造物への取付状態において水平方向に離間して構造物に当接する少なくとも２つの脚部が設けられるのが好ましい。

【００１２】また、上記ドラムの前方のツバ部が、ドラムの光ケーブル巻回部分を延線側と末端余長側とに仕切り、且つ、光ケーブルを通過させるためのスリットを有するのが好ましい。

【００１３】また、末端側コネクタが、末端側コネクタボックス内で光ケーブルの末端に接続された末端側接続用心線の先端に設けられ、先端側コネクタが、先端側コネクタボックス内で光ケーブルの先端に接続された先端側接続用心線の先端に設けられ、これら末端側コネクタ及び先端側コネクタの先端面上で、末端側接続用心線及び先端側接続用心線の先端面が面一に露出され、末端側コネクタ及び先端側コネクタが互いに先端面同士で突き合わせ接続可能とされるのが好ましい。

【００１４】一方、本発明は、上記光ケーブルリールを用いた光ケーブルの仮設方法であって、末端側コネクタボックスをドラムに取り付けた状態で先端側コネクタボックスを末端側コネクタボックスから取出し、その先端側コネクタボックスごと光ケーブルの先端側をドラムから所定位置まで繰出し、フレームをバンドにより構造物に取付けた後、末端側コネクタボックスをドラムから外してバンドにより構造物に取付け、末端側コネクタボックス内の末端側コネクタに別の先端側コネクタを接続し、先端側コネクタボックスの露出された先端側コネクタに別の末端側コネクタ又は機器を接続するものである。

【００１５】

【発明の実施の形態】以下、本発明の好適な実施の形態を添付図面に基づいて詳述する。

【００１６】図１及び図２に示すように、光ケーブルリール１は、従来同様フレーム２とドラム３を備え、ドラム３に光ケーブル４を数周巻回するようになっている。フレーム２の底部には走行移動のためのキャスタ５が設けられる。なお図１は使用前の持ち運びのときの状態を示している。

【００１７】フレーム２には上下にそれぞれバンド６が設けられ、任意の構造物（ここでは電柱７）に縛って固定できるようになっている。このようにかかる光ケーブルリール１は電柱７等の高い位置に取付け可能なので、歩行等の邪魔にならず、放置しても信頼性が確保できる。また図５にも示すが、フレーム２の背面部の四隅にそれぞれ突出する脚部８が設けられ、電柱７へのリール取付時に脚部８が電柱７に当接し、突っ張る形となってリール１の安定を確保している。特に、周方向、高さ方向に２点支持となるため、リール１の取付け状態は極めて安定する。

【００１８】ドラム３は前後にツバ部９，１０を有するが、前方のツバ部９はドラム先端より若干後方に配され、ドラム３の光ケーブル巻回部分（円筒部）を前方の末端余長部１１と後方の延線部１２とに仕切るようになっている。即ち、ツバ部９に半径方向に延びるスリット１３が設けられ、これから光ケーブル４を通過させることができる。よって使用前の状態において、ドラム３への光ケーブル４の巻回は、光ケーブル４の末端側を末端余長部１１に数周巻き付けた後、これより先端側をスリット１３を通じて延線部１２に移動させ、ここに延線分の大部分の光ケーブル４を巻回し（図示省略）、この後先端部をスリット１３を通じて末端余長部１１に戻し、数周巻き付けるという方法が採られる。光ケーブル４の末端部１４及び先端部１５はツバ部９に設けられた複数のクランパ１６に離脱可能にクランプされ、ばらつきが防止される。またドラム３前端に正方形状の端板１７が取り付けられ、ツバ部９との間に末端余長部１１を形成するようになっている。

【００１９】フレーム２の上部に持ち運びのためのハンドル部１８が設けられ、ハンドル部１８にブレーキレバー１９が設けられ、ドラム３の軸心部に設けられたブレーキ２０を作動・解除できるようになっている。ブレーキ２０は通常は作動されてドラム３の回転を制限ないし停止させている。ブレーキレバー１９が握られると、ブレーキ２０が解除されてドラム３が自由に回転できるようになる。ハンドル部１８にはブレーキレバー１９を握った状態に保持しておくためのフック２１が設けられる。またツバ部９の前面にドラム３を手回しするための可倒式ハンドル５６が設けられる。

【００２０】光ケーブル４の末端部１４及び先端部１５には、従来の雄雌コネクタに代わる末端側コネクタボックス２２（以下親ボックスという）及び先端側コネクタボックス２３（以下子ボックスという）が取り付けられ

る。親ボックス２２は子ボックス２３に比べ約２倍の大きさとされ、通常は子ボックス２３を収納させている。この収納状態において、親ボックス２２は、固定部材たる複数の固定金具２４により端板１７の前面に固定されている。この親ボックス２２はワンタッチで着脱自在である。親ボックス２２の前面をなす蓋板２５はロックつまみ２６の回転により開閉できる。これにより子ボックス２３は親ボックス２２から取り出せる。これらボックスは防水・防滴構造とされる。

【００２１】図３に示すように、子ボックス２３は親ボックス２２の片側（図では右側）に寄せられて配置され、図示しない別の固定部材でワンタッチで着脱自在に取り付けられる。そしてその反対側から親ボックス２２内に光ケーブル４の末端部１４が挿入される。挿入部には着脱可能な防水パッキン２７が設けられる。末端部１４の挿入部分は段剥きされ、複数の心線２８が所定長さ露出される。そのうち根元のシース部分が、親ボックス２２内に設けられたクランプ部材２９でクランプされる。心線２８は少なくとも半周巻回された後各先端が融着ホルダ３０に固定され、この融着ホルダ３０により各先端が、同数の末端側接続用心線３１（以下親心線という）の各末端に融着接続される。親心線３１は少なくとも半周巻回され、それら先端には一括して末端側コネクタ３２（以下親コネクタという）が取り付けられる。このように親ボックス２２内には光ケーブル４の心線２８と親心線３１との余長を収納できる。親コネクタ３２は、従来のフェルールに代わるもので、図４に示すように全数の親心線３１を一括挿入固定させ、且つ先端面上で親心線３１の先端面を面一に露出させている。(a) ～ (c) に示すように、親コネクタ３２の断面形状には四角、円等が考えられ、親心線３１の配列形状も四角、円、多重円等が考えられる。こうして実質的には光ケーブル４の末端部１４の心線２８が親コネクタ３２の先端面上で露出されるようになる。なお光ケーブル４のテンションメンバである鋼より線３３が固定具３４でクランプされる。この光ケーブル４の構造については後述する。

【００２２】子ボックス２３についても同様の構成が採られる。即ち、光ケーブル４の先端部１５が親ボックス２２の防水パッキン３５を貫通し、子ボックス２３内に挿入される。先端部１５の挿入部分は段剥きされ、複数の心線３６が所定長さ露出される。そのうち根元のシース部分が、子ボックス２３内に設けられたクランプ部材３７でクランプされる。心線３６は少なくとも半周巻回された後各先端が融着ホルダ３８に固定され、この融着ホルダ３８により各先端が、同数の先端側接続用心線３９（以下子心線という）の各末端に融着接続される。子心線３９は少なくとも半周巻回分の余長がとられた後、先端に一括して先端側コネクタ４１（以下子コネクタという）が取り付けられる。このように子ボックス２３内にも光ケーブル４の心線３６と子心線３９との余長を収納できる。子コネクタ４１は親コネクタ３２と同様の構成である。こうして実質的には光ケーブル４の先端部１５の心線３６も子コネクタ４１の先端面上で露出されるようになる。なお子ボックス２３内でも光ケーブル４の鋼より線３３が固定具４２でクランプされる。

【００２３】子心線３９の先端側と子コネクタ４１とは、図示するように防水パッキン４０を貫通して子ボックス２３外に露出させたり、子ボックス２３内に収納したりすることができる。即ち子ボックス２３の前面の蓋板も開閉可能で、これを開いて防水パッキン４０を着脱すれば、子心線３９の先端側と子コネクタ４１とを露出させ或いは収納させられる。リールの持ち運びの際は収納されており、リール同士を接続したりする際は図示の如く露出される。この接続時、親コネクタ３２と子コネクタ４１とが、親ボックス２２内に固設された接続用アダプタ４３に対向側から挿入されロックされ、互いに突き合わせ接続される。これにより末端部１４と先端部１５の心線２８，３６同士が光学的に接続されることとなる。

【００２４】ここで、親ボックス２２の背面部の四隅にはコ字状の脚部４４が起立して設けられる。そしてボックス短辺方向に沿って脚部４４同士を挿通して掛け渡すバンド４５が設けられる。このバンド４５も図６、図７に示すように、親ボックス２２を電柱７に縛って取り付けるためのものである。特にフレーム同様、取付時に脚部４４が電柱７に当接し突っ張る形となって、親ボックス２２の安定が確保できる。親ボックス２２のドラム３への取付時はバンド４５が折り畳まれて親ボックス２２と端板１７の間に収納される。

【００２５】図８に示すように、光ケーブル４は、中心に鋼より線３１（３３）を含むスペーサ４６の外周部の溝４７に、心線２８（３６）をそれぞれ収め、これら全体を緩衝層４８で被覆し、さらに緩衝層４８をＰＶＣシース４９で被覆したものが用いられる。心線数は１２心、ケーブル外径は約7.5㎜ 、ケーブル条長は500mで、重量は約30kgと軽量で、ケーブルの0.2%伸びが125kgfに耐えられるようになっている。特に鋼より線３３のテンションメンバを用いたので耐張力に優れ、スペーサ４６及び緩衝層４８を用いたので耐側圧に優れ、ＰＶＣシース４９を用いたので耐摩耗に優れたものとなっている。

【００２６】次に、かかる光ケーブルリールを用いた光ケーブルの仮設方法を説明する。

【００２７】図９に本仮設方法の一例を示す。電柱７に既設光ケーブル５０が架線されており、この既設光ケーブル５０はクロージャ５１間の２～５kmを一区間として、クロージャ５１により順次連結されている。信号流れ方向は左方から右方で、ここでは左方のクロージャ５１から分岐線５２を分岐させ、その先端を最初の光ケーブルリール１Ａに接続するようになっている。

【００２８】光ケーブルリール１Ａについては、まず、光ケーブルリール１Ａを地上に置き、親ボックス２２をドラム３に取り付けた状態で、親ボックス２２から子ボックス２３を取り出し、子ボックス２３ごと光ケーブル４の先端側をドラム３から繰り出す。このとき親ボックス２２はドラム３と一体に回転する。

【００２９】こうしてほぼ全長の繰出しを行った後、リール１Ａを持ち上げ、そのリール１Ａをバンド６により電柱７上に固定する。このときリール１Ａに予めバンド６が取り付けられているので、別にバンドを用意する必要がない。次に親ボックス２２を取り外し、末端余長部１１に巻付けられていた光ケーブル４をほどいて親ボックス２２を垂れ下げ、その親ボックス２２をバンド４５で電柱７に固定する。このときにも親ボックス２２に予めバンド４５が取り付けられているので、作業が容易である。こうした後、延線側の光ケーブル４を電柱７、メッセンジャワイヤ５５等に固定バンド５３、ケーブルクリップ５４等で順次固定していく。

【００３０】次の光ケーブルリール１Ｂも同様に引き延ばし、固定した後、最初のリール１Ａの子ボックス２３Ａを、次のリール１Ｂの親ボックス２２Ｂと接続する。即ち、次の親ボックス２２Ｂの中には既に子ボックス２３Ｂがないので、その代わりに最初の子ボックス２３Ａを入れ、接続を行う。具体的には、親ボックス２２Ｂの蓋板２５Ｂを開け、これに子ボックス２３Ａを入れ、子ボックス２３Ａ内から子コネクタ４１を取り出し、親ボックス２２Ｂ内の接続用アダプタ４３に差し込む。これによって最初のリール１Ａと次のリール１Ｂとが光学的に接続される。こうして親ボックス２２Ｂの蓋板２５Ｂを閉じれば接続作業が完了する。なお作業後の各ボックスの防水性は当然ながら確保される。

【００３１】次のリール１Ｂの子ボックス２３Ｂは、信号を必要とする機器等のある位置まで延線させ、その機器（図示せず）と接続する。また最初の分岐線５２の先端にも同様の子ボックス２３Ｃを設けておき、最初の親ボックス２２Ａと同様の方法で接続する。

【００３２】なお、光ケーブル４の全長を繰出したリール１については、スリット１３から光ケーブル４を抜き出し、光ケーブル４のみを残してリール本体部（フレーム２、ドラム３）を取り外すことができる。これにより電柱７からリール本体部を取り除ける。もちろん光ケーブル４が残存する場合は、光ケーブル４を巻き付けた状態でリール本体部を残しておけばよい。

【００３３】このように、上記によれば、リール、ケーブル、ボックス等を全て電柱７等の高い位置に放置でき、歩行等の邪魔にならず、信頼性等も向上できる。

【００３４】また、従来のコネクタに代わりボックスを採用したので安価となり、コネクタ３２，４１の端面がフラットなので清掃、研磨再生が容易である。またコネクタ３２，４１に支障が生じたときにも、親心線３１又は子心線３９の部分のみを融着ホルダ３０，３８から外し、予めコネクタ３２，４１が取り付けられた新品を再融着すればよい。このように製作費、メンテナンス費が非常に安価となる。

【００３５】以上、本発明の実施の形態を示したが、これに限らず本発明はあらゆる実施の形態を採ることができる。また本発明は既設光ケーブルの支障時の仮設にも応用できる。

【００３６】

【発明の効果】本発明は次の如き優れた効果を発揮する。

【００３７】（１）　リール、ケーブル、ボックス等を全て電柱等の高い位置に放置でき、歩行等の邪魔にならず、信頼性等も向上できる。

【００３８】（２）　製作費、メンテナンス費が非常に安価となる。

【図面の簡単な説明】

【図１】本発明の光ケーブルリールを示す正面図である。

【図２】本発明の光ケーブルリールを示す右側面図である。

【図３】末端側及び先端側コネクタボックスを示す斜視図である。

【図４】末端側及び先端側コネクタを示す斜視図である。

【図５】光ケーブルリールの取付状態を示す斜視図である。

【図６】末端側コネクタボックスの取付状態を示す斜視図である。

【図７】同平面図である。

【図８】光ケーブルを示す断面図である。

【図９】本発明の光ケーブルリールを用いた光ケーブルの仮設方法を示す斜視図である。

【図１０】従来の光ケーブルリールを示し、(a) は正面図、(b) は右側面図である。

【図１１】従来の光ケーブルを示す正面図である。

【図１２】従来の光ケーブルのコネクタを示す縦断面図である。

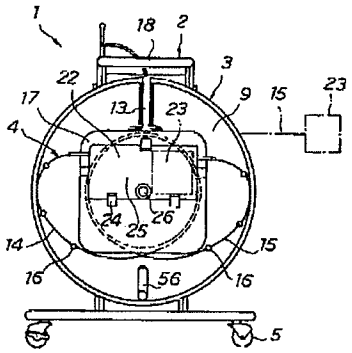
【図１３】従来の光ケーブルのコネクタの取付状態を示す平面図である。

【符号の説明】

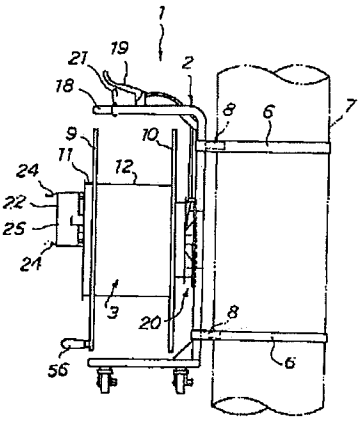
１　光ケーブルリール
２　フレーム
３　ドラム
４　光ケーブル
６，４５　バンド
８，４４　脚部
９　ツバ部
１１　末端余長側
１２　延線側

１３　スリット
１４　末端部
１５　先端部
２２　末端側コネクタボックス（親ボックス）
２３　先端側コネクタボックス（子ボックス）
２４　固定金具（固定部材）
３１　末端側接続用心線（親心線）
３２　末端側コネクタ（親コネクタ）
３９　先端側接続用心線（子心線）
４１　先端側コネクタ（子コネクタ）

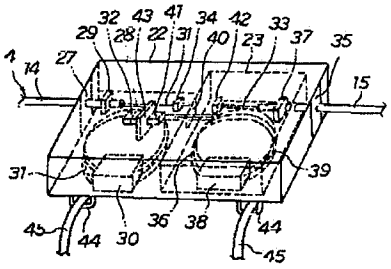
【図１】



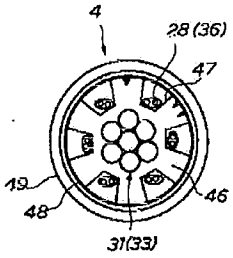
【図２】



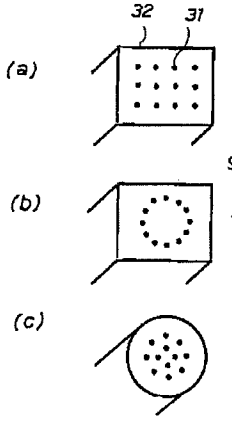
【図３】



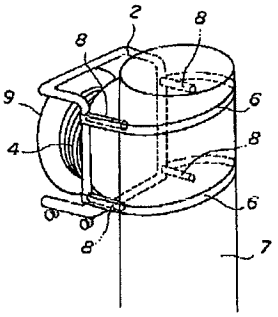
【図８】



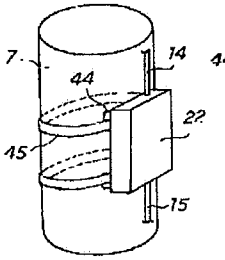
【図４】



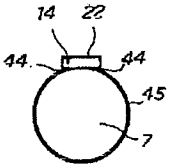
【図５】



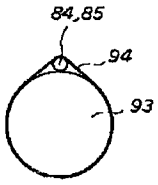
【図６】



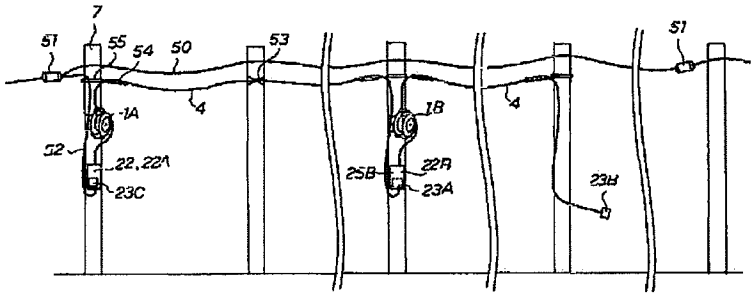
【図７】



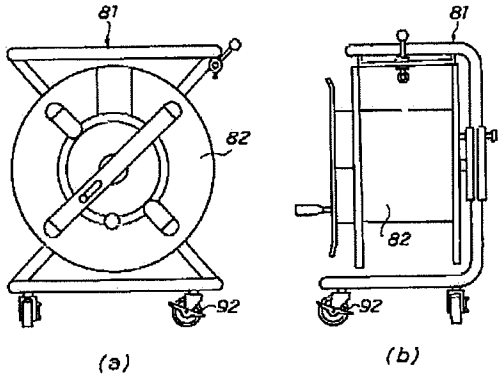
【図１３】



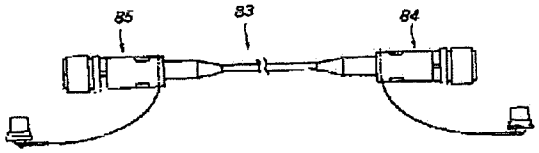
【図９】



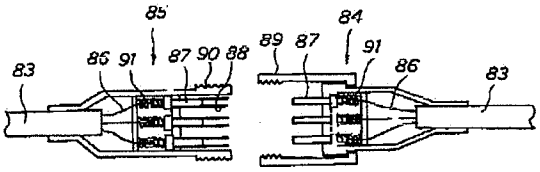
【図１０】



【図１１】



【図１２】



フロントページの続き

(72)発明者　樟山　裕幸
茨城県日立市砂沢町880番地　日立電線株式会社高砂工場内
(72)発明者　深堀　敏夫
茨城県日立市砂沢町880番地　日立電線株式会社高砂工場内
(72)発明者　佐藤　東史
茨城県日立市日高町５丁目１番１号　日立電線株式会社日高工場内
(72)発明者　竹山　茂治
茨城県日立市日高町５丁目１番１号　日立電線株式会社日高工場内
(72)発明者　江崎　幹男
北海道札幌市中央区北１条東２丁目５番３号　北海道総合通信網株式会社内

EUROPEAN PATENT OFFICE

Patent Abstracts of Japan

PUBLICATION NUMBER : 2005073365
PUBLICATION DATE : 17-03-05

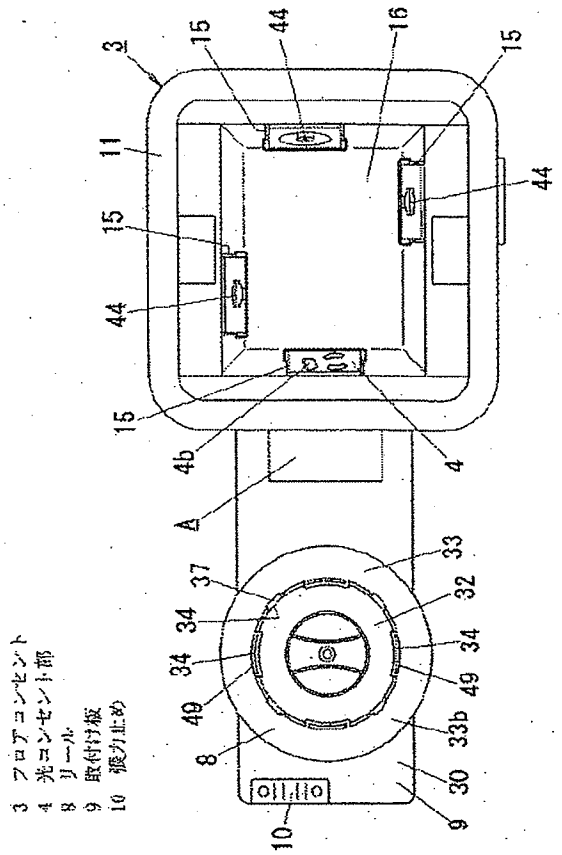
APPLICATION DATE : 22-08-03
APPLICATION NUMBER : 2003299095

APPLICANT : MATSUSHITA ELECTRIC WORKS LTD;

INVENTOR : NAKAYAMA SHOJI;

INT.CL. : H02G 3/18 G02B 6/36 H02G 3/38

TITLE : FLOOR WIRING DEVICE



ABSTRACT : PROBLEM TO BE SOLVED: To enable the user to arrange an optical cable from a plug socket provided in a floor to an apparatus like a communication apparatus such as a PC or the like equipped with an optical cable connection, and to house a floor wiring device in underfloor space by preventing the wire break in the redundant section of an optical fiber being the core of the optical cable.

SOLUTION: A floor plug socket 3 attached in an opening 2 made in the floor 1 is provided with an optical plug socket 4 for an optical cable. The floor plug socket 3 is equipped with a reel 8 for winding the redundant section 7 of the optical cable 6 which is wired in the underfloor space 5 under the floor 1 and whose end is connected to the plug socket part 4. The break of the redundant section of the optical fiber is prevented by making the radius of the winding section of the reel not less than the tolerable radius of curvature of the optical fiber being the core of the optical fiber. Hereby this reel 8 provides a floor wiring device which copes with optical wiring.

COPYRIGHT: (C)2005,JPO&NCIPI

(19)日本国特許庁(JP)　(12)公開特許公報(A)　(11)特許出願公開番号
特開2005-73365
(P2005-73365A)
(43)公開日　平成17年3月17日(2005.3.17)

(51)Int.Cl.[7]		F I			テーマコード（参考）
H02G	3/18	H02G	3/18	A	2H036
G02B	6/36	G02B	6/36		5G361
H02G	3/38	H02G	3/28	A	5G363

審査請求 未請求　請求項の数 4　OL　（全 11 頁）

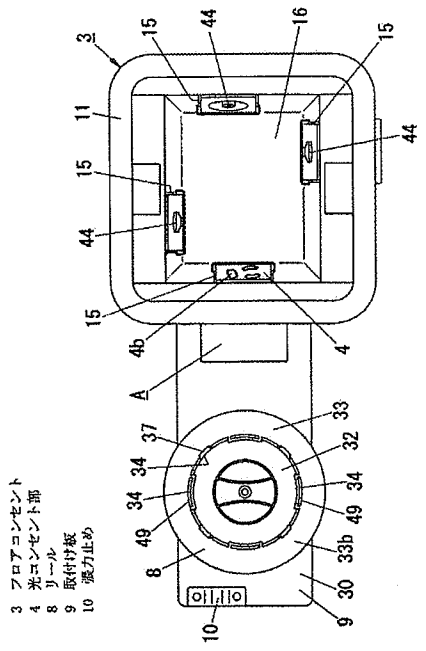
(21)出願番号　特願2003-299095 (P2003-299095)
(22)出願日　平成15年8月22日 (2003.8.22)

(71)出願人　000005832
松下電工株式会社
大阪府門真市大字門真１０４８番地
(74)代理人　100087767
弁理士　西川　惠清
(74)代理人　100085604
弁理士　森　厚夫
(72)発明者　中山　将司
大阪府門真市大字門真１０４８番地　松下電工株式会社内

Ｆターム(参考)　2H036 QA47 RA14 RA24
5G361 CA04 CB01
5G363 AA12 BA10 DB33

(54)【発明の名称】床配線装置

(57)【要約】
【課題】　床に設けたフロアコンセントから光ケーブル接続部を備えたＰＣ等の通信端末のような機器に光配線することができる。光ケーブルの芯線である光ファイバーの余長部分における断線を防止して床下空間に収納できる。
【解決手段】　床１に形成した開口部２に取付けられるフロアコンセント３に光ケーブル用の光コンセント部４を設ける。フロアコンセント３に床１の下方の床下空間５に配線され且つ端部が上記光コンセント部４に接続される光ケーブル６の余長部分７を巻き取るためのリール８を備える。
【選択図】　図１



【特許請求の範囲】
【請求項1】
床に形成した開口部に取付けられるフロアコンセントに光ケーブル用の光コンセント部を設けると共に、フロアコンセントに床の下方の床下空間に配線され且つ端部が上記光コンセント部に接続される光ケーブルの余長部分を巻き取るためのリールを備えて成ることを特徴とする床配線装置。
【請求項2】
フロアコンセントの上部開口部の開口平面と平行でない側面から外側方に向けて突出する取付け板にリールを取付けて成ることを特徴とする請求項１記載の床配線装置。
【請求項3】
取付け板にケーブルを保持するための張力止め具を設けて成ることを特徴とする請求項２記載の床配線装置。
【請求項4】
フロアコンセントの光コンセント部を保持するための取付け片にリールを備えた取付け板を取付けて成ることを特徴とする請求項２又は請求項３記載の床配線装置。

【発明の詳細な説明】
【技術分野】
【0001】
本発明は、光ケーブル用の光コンセント部を備えた床配線装置に関するものである。
【背景技術】
【0002】
従来から床配線装置として床に形成した開口部に取付けられるフロアコンセントが知られている。（例えば、特許文献１参照）
上記のような従来例のフロアコンセントは、蓋を開閉自在に取付けた開口枠と、開口枠に取付けたボックス部と、ボックス部に設けた金属線用コンセント部とから構成してあり、ボックス部を床に形成した開口部から床下空間内に挿入すると共に床に形成した開口部の上面側に開口枠を載置し、この状態で開口枠を床に固定してある。金属線用コンセント部には床下空間に配線された電源線、情報線等の金属線を接続してある。そして、床下空間に配線した金属線と金属線コンセント部との接続は床下空間にあらかじめ配線した金属線の端部を床に形成した開口部から床上に引出し、床上空間で金属線の最先端を金属線コンセント部に接続し、金属線の余長部分は束ねて開口部から床下空間に差し入れて床下空間に収納している。
【0003】
ところで、近年、通信速度の向上に伴い光ファイバーを芯線としてた光ケーブルが主流となりつつあり、現在、通信インフラを提供している通信インフラ提供会社によって各住宅までの光ケーブルの敷設工事が整いつつある。また、光が直接取り込めるメディアコンバータ付きＰＣや、メディアコンバータ付きＰＣカードの登場で、事務所等ではデスクまで直接光ケーブルを敷設するケースも出始めている。今後コンテンツが充実し、通信速度が向上すれば、ＰＣ等の通信端末のような機器側も光ファイバーを芯線とする光ケーブルに対応するようになり、住宅でも各部屋に光コンセントが必要となる。
【0004】
しかしながら、従来のフロアコンセントにおいては金属線コンセント部しか設けてなかったので、このような光ケーブルに直接対応したＰＣ等の通信端末のような機器にはフロアコンセントから光配線を行うことができないのが現状である。
【0005】
そこで、フロアコンセントに光ケーブル用の光コンセント部を設けることが考えられる。しかしながら、光ファイバーよりなる芯線の外周を外皮で被覆した光ケーブルは、芯線である光ファイバーの許容曲げ半径が決まっており、この許容曲げ半径以下に光ファイバ

ーを曲げると折れて断線するという光ファイバーに特有な問題があり、従来の金属線の余長部分を束ねるように芯線が光ファイバーよりなる光ケーブルの余長部分を束ねて床下に収納すると、この許容曲げ半径以下に曲げられて光ケーブルの芯線である光ファイバーが折れて断線するという問題がある。

【0006】

また、光ケーブルの余長部分の処理をするためにフロアコンセントのボックス部の側面から側方に突出したプレートの両側縁に立壁を形成し、光ケーブルの余長部分を巻回してこの巻回部分をプレート上面部に配置することにより、外に広がろうとする巻回部分をプレート両側縁の立壁によってその拡がりをおさえて余長部分を巻回状態でプレート上に保持することが考えられるが、このようなものにおいては立壁の外への光ケーブルのはみ出しを防止して余長部分をコンパクトに処理できるが、光ケーブルを巻回す際に光ケーブルの芯線である光ファイバーの許容曲げ半径よりも小さく曲げられることがあり、この場合も、折れて断線する恐れがある。

【特許文献1】特開平６－７８４３４号公報

【発明の開示】

【発明が解決しようとする課題】

【0007】

本発明は上記の従来の問題点に鑑みて発明したものであって、床に形成したフロアコンセントからＰＣ等の通信端末のような機器に光配線することができ、しかも、光ケーブルの芯線である光ファイバーの余長部分における断線を防止して床下空間に収納できる床配線装置を提供することを課題とするものである。

【課題を解決するための手段】

【0008】

上記課題を解決するために本発明に係る床配線装置は、床１に形成した開口部２に取付けられるフロアコンセント３に光ケーブル用の光コンセント部４を設けると共に、フロアコンセント３に床１の下方の床下空間５に配線され且つ端部が上記光コンセント部４に接続される光ケーブル６の余長部分７を巻き取るためのリール８を備えて成ることを特徴とするものである。

【0009】

このようにフロアコンセント３に光コンセント部４を設けることで、床上空間に配置する機器にフロアコンセント３から光配線でき、また、光ケーブル６の余長部分をフロアコンセント３に備えたリール８に巻き付けることで、フロアコンセント３部分で光ケーブル６の余長部分７の処理ができると共に、光ケーブル６がリール８の巻き部分の半径以下に小さく曲げられることがなく、したがって、リール８の巻き部分の半径を光ケーブル６の芯線である光ファイバーの許容曲げ半径以上とすることで、光ファイバーの余長部分の断線を防止できるものである。

【0010】

また、フロアコンセント３の上部開口部の開口平面と平行でない側面から外側方に向けて突出する取付け板９にリール８を取付けることが好ましい。

【0011】

このような構成とすることで、光ケーブル６の余長部分７をフロアコンセント３に装備したリール８に巻装した状態でフロアコンセント３と共に床下空間５内に配置して収納できて、光ケーブル６の余長部分が許容曲げ半径以下に折れ曲がったりするのを防止でき、特に、フロアコンセント３の上部開口部の開口平面と平行でない側面から外側方に向けて突出する取付け板９にリール８を取付けるので、床１に設けた開口部２から床下空間５に配線した光ケーブル６の先端部を床上空間に引出し、床上空間で光ケーブル６の余長部分をリール８に巻き取った状態で床１に形成した開口部２から床下空間５にフロアコンセント３と共にリール８を取付けた取付け板９を挿入して床下空間５内に収納できて、作業が簡略化するものである。

【0012】

また、取付け板９に光ケーブル６を保持するための張力止め具１０を設けることが好ましい。

【0013】

このような構成とすることで、光ケーブル６の余長部分をリール８に巻く際に光ケーブル６の床下空間５内に配線した余長部分以外の部分に張力がかからない状態でリール８に余長部分を巻装することができるものであって、巻装作業が容易で且つ断線しないように巻装作業ができるものであり、また、光ケーブル６に何らかの外力が作用した場合も、張力止め具１０部分で張力止めができるので、光ケーブル６のリール８に巻装した部分に張力がかからないようにできるものである。

【0014】

また、フロアコンセント３の光コンセント部４を保持するための取付け片２０にリール８を備えた取付け板９を取付けることが好ましい。

【0015】

このような構成とすることで、光コンセント部４を保持するための取付け片２０を利用してリール８を備えた取付け板９を取付けることができて、フロアコンセント３へのリール８を備えた取付け板９の取付け構成が簡略化できると共に、リール８を光コンセント部４に近づけて配置できて余長部分をリール８に巻き取った光ケーブル６の先端部を弛みなどが生じないようにして光コンセント部４に接続できて光ケーブル６に弛みが生じることによる折れ曲り等を防止して断線が生じないようにできるものである。

【発明の効果】

【0016】

本発明は、フロアコンセントに光コンセント部を設けることで、床上空間に配置する機器にフロアコンセントから光配線でき、また、光ケーブルの余長部分をフロアコンセントに備えたリールに巻き付けることで、フロアコンセント部分で光ケーブルの余長部分の処理ができると共に、光ケーブルがリールの巻き部分の半径以下に小さく曲げられることがなく、したがって、リールの巻き部分の半径を光ケーブルの芯線である光ファイバーの許容曲げ半径以上とすることで、光ファイバーの余長部分の断線を防止できるものであり、これにより光配線に対応できる床配線装置を提供することができる。

【発明を実施するための最良の形態】

【0017】

以下、本発明を添付図面に示す実施形態に基いて説明する。

【0018】

図１乃至図３には本発明の床配線装置の主体を構成するフロアコンセント３が示してある。フロアコンセント３は開口枠１１と、開口枠１１に開閉自在に取付けて開口枠１１の開口を開閉自在とする蓋５０と、開口枠１１に取付けられて下方に突出する取付け部１３と、取付け部１３に取付けられるコンセント部Ａと、床１への固定手段１４と、開口枠１１内に嵌め込まれる上方に開口し且つ側面にコンセント部Ａが臨む窓部１５を設けた箱状をした内カバー１６とで構成してある。

【0019】

取付け部１３は主取付け部１７と副取付け部１８とで構成してある。主取付け部１７は横向きの底部片１９の一側端部から斜め上外側方に向けて傾斜した取付け片２０を突出し、取付け片２０の両端部から上方に支持脚片２１を突出して構成してある。支持脚片２１の上端部を開口枠１１の内周の全周を内側に段落して形成した蓋受け周段部１１ａに固着することで主取付け部１７を開口枠１１に固着してあり、この主取付け部１７の固着状態で取付け片２０が開口枠１１の一辺の略下方に位置すると共に開口枠１１の開口の下方位置に底部片１９が位置している。取付け片２０には取付け用開口（図示せず）が設けてあって、この取付け用開口にコンセント部Ａをはめ込んで取付けるようになっている。取付け片２０の取付け用開口の両側には取付け孔（図示せず）が設けてある。

【0020】

底部片１９の両側端には下横片２３が固着してあり、下横片２３の側端から上方に向け

て垂直な当たり片２４が突設してある。開口枠１１の蓋受け周段部１１ａに設けた孔に上方から長ボルト２５が挿入してあり、長ボルト２５の下端部が下横片２３に設けた孔に挿入されるとともに抜け止めされており、これにより長ボルト２５は蓋受け周段部１１ａの上面側に位置する頭部に設けたプラス又はマイナス溝にドライバー等の回転操作治具を挿入して回転することで回転は自在であるが、上下方向には移動しないようになっている。長ボルト２５には挟持部材２６が回転自在に螺合してある。そして、長ボルト２５を回転操作すると長ボルト２５と共に挟持部材２６が供回りするが直ぐに当たり片２４に当たって先端部が外側方に突出した状態で供回りが防止され、この状態で更に長ボルト２５を回転すると挟持部材２６が上方に移動し、挟持部材２６と開口枠１１とで床１の開口部２の縁を上下から挟持して固定できるようになっている。したがって、上記長ボルト２５、挟持部材２６、当たり片２４、開口枠１１により床１への固定手段１４が構成してある。

【0021】

副取付け部１８は取付け用開口を有する斜め上方に傾斜した取付け片２７の上下に上下取着片２８、２９が設けてあり、取付け片２７の取付け用開口にコンセント部Ａをはめ込んで取付けるようになっている。この副取付け部１８は上取着片２８を開口枠１１の蓋受け周段部１１ａに引っ掛け係止して取付けると共に下取着片２９を底部片１９の取付け片２０を連出していない３辺のうちの一辺にねじ具等により固着するものである。この副取付け部１８の取付けは後述のようにして開口枠１１に主取付け部１７を取付けた状態のものを床１の開口部２に挿入して固定手段１４で固定した後に、取付けるものである。

【0022】

上記のようにフロアコンセント３の主取付け部１７、副取付け部１８にコンセント部Ａを装着するのであるが、本発明においては、少なくとも複数のコンセント部Ａのうちいずれかは光配線用の光コンセント部４を取付け、また、フロアコンセント３に光コンセント部４に接続される光ケーブル６の余長部分７を巻き取るためのリール８を設けることに特徴がある。

【0023】

添付図面に示す実施形態において光コンセント部４を主取付け部１７に取付けた例が示してある。光コンセント部４には後面側に開口するレセプタクル４ａと、前面側に開口するレセプタクル４ｂとを設けてある。

【0024】

取付け板９は横片３０の一側端から上方に上向き片３１を突設して構成してあって略Ｌ状をしており、添付図面に示す実施形態では上向き片３１は主取付け部１７の取付け片２０と同じ傾斜をしており、また、取付け片２０に装着するコンセント部Ａである光コンセント部４を挿通できる開口が設けてあり、また、開口の両側にねじ孔を設けてある。そして、図４に示すように主取付け部１７の取付け片２０の外面に略Ｌ字状をした取付け板９の上向き片３１を当接して取付け片２０に設けた孔からねじ具を挿入して取付け板９の上向き片３１のねじ孔に螺着することで取付け板９をフロアコンセント３の一側面を構成する主取付け部１７の取付け片２０の外面に取付けてあって、この状態で横片３０がフロアコンセント３の一側面を構成する主取付け部１７の取付け片２０から外側方に向けて突出している。

【0025】

取付け板９の横片３０の上面にはリール８を横向けにして取付けてある。添付図面に示す実施形態ではリール８は固定部３２と、固定部３２に対して移動自在に取付けられたリール部３３とで構成してある。固定部３２は横片３０にねじにより固着してあり、固定部３２の外周には複数のガイド片３４が上方に向けて突設してあり、更に固定部３２の外周には複数のＬ状片３５が外側方に向けて突出してある。リール部３３は環状をした巻き胴部３３ａの両側に鍔部３３ｂを設けたものである。そして、上記ガイド片３４でリール部３３をガイドすることでリール部３３が固定部３２に対して移動可能となっている。

【0026】

ここで、図５（ａ）（ｂ）に示すように巻き胴部３３ａの内周はガイド片３４に沿って

ガイドされるのであるが、複数のガイド片３４のうち少なくとも幾つかのガイド片３４は巻き胴部３３ａの内周に設けたガイド孔４９に移動自在に嵌め込まれていてリール部３３が固定部３２に対して近ずいたり離れたりする方向には移動できるが周方向には回転できないようになっている。また、別のガイド片３４には先端に係止部３７が設けてあり、巻き胴部３３ａの内周の固定部３２に近い方の端部に設けた第１の被係止部３８と、固定部３２に遠い方の端部に設けた第２の被係止部３９とに上記係止部３７が係止自在となっている。

【0027】

リール部３３の両鍔部３３ｂのうち固定部３２に近い方の鍔部３３ｂはＬ状片３５に対応する部分が切除してあって切除部１２となっており、リール部３３をガイド片３４に沿って移動してリール部３３が固定部３２に最も近づいた状態で係止部３７が第２被係止部３９に係止し、この状態でＬ状片３５の基部側片３５ａが切除部１２に嵌り込みむと共に基部側片３５ａに対して直角となった先端片３５ｂが他方の鍔部３３ｂの内面の周端に当接するようになっている（図５（ａ）参照）。一方、リール部３３をガイド片３４に沿って上記と逆に移動してリール部３３が固定部３２から最も遠ざかった状態で係止部３７が第１被係止部３８に係止してリール部３３が固定部３２から外れないようになっている（図５（ｂ）参照）。

【0028】

リール部３３の環状をした巻き胴部３３ａの外周の半径は使用する光ケーブル６の芯線である光ファイバーの許容曲げ半径以上に設定してある。

【0029】

取付け板９の横片３０の上面の先端部付近には光ケーブル６を保持するための張力止め具１０が設けてある。

【0030】

上記のような構成の光コンセント部４に接続される光ケーブル６の余長部分７を巻き取るためのリール８を備えたフロアコンセント３の施工に当たっては以下のようにして行うものである。

【0031】

すなわち、スラブのような床基材４１の上方に床下空間５を介して形成した床１に開口部２を形成し、この開口部２に上記フロアコンセント３をはめ込んで取付けるのであるが、この場合、まず図６に示すように床下空間５に配線した光ケーブル６を床１の開口部２から床上空間に引出す。次に、図７のように光ケーブル６の開口部２から引出した余長部分７の付け根部分（つまり、開口部２から引出した光ケーブル６の余長部分７の開口部２のすぐ近くの部分）をフロアコンセント３に取付けた取付け板９の張力止め具１０に保持させる。次に、リール部３３を固定部３２から離れるように移動させて上方に突出させた状態で、リール部３３に光ケーブル６の余長部分７を巻き、次に、図８のように光ケーブル６の先端の光用プラグ４２を光コンセント部４の後面側に開口するレセプタクル４ａにはめ込んで接続する。このようにして光ケーブル６の余長部分７をリール部３３に巻装することで余長部分７の処理を行うのであるが、この時、光ケーブル６はリール部３３の巻き胴部３３ａの半径以下に小さく曲げられることがなく、したがって、巻き胴部３３ａの外周の半径を使用する光ケーブル６の芯線である光ファイバーの許容曲げ半径以上に設定することで、余長部分７の処理に当たって余長部分７が折れて断線したりすることがないものである。

【0032】

リール部３３への巻き取りが終わるとリール部３３を固定部３２に近づくように移動させて係止部３７を第２被係止部３９に係止すると共にＬ状片３５の先端片３５ｂを他方の鍔部３３ｂの内面の周端に当接してリール部３３に巻装した光ケーブル６の余長部分７がリール部３３の外方にはみ出さないようにしている。

【0033】

ここで、光ケーブル６の先端部にはあらかじめ光用プラグ４２が設けてあるものであっ

てもよく、また、現場で、光ケーブル６の先端部の外皮を剥いて芯線である光ファイバーを露出させ、この光ケーブル６の先端の光ファイバー部分に光用プラグ４２を取付けるようにしてもよい。

【0034】

このように光ケーブル６の余長部分をリール８に巻装して断線しないようにした状態で、フロアコンセント３を図９のように取付け板９が先となるように斜めにした状態で床１に設けた開口部２に上方から斜め下方に向けて挿入し、フロアコンセント３の開口枠１１より下方の部位を床下空間５に配置した状態で開口枠１１を床１の開口部２の上縁外周の部分に載置する。この状態で長ボルト２５の頭部のプラス又はマイナス溝にドライバー等の回転操作治具を挿入して回転し、挟持部材２６を上方に移動させて挟持部材２６と開口枠１１とで床１の開口部２の縁を上下から挟持して固定することで、図１０に示すようにフロアコンセント３を床１に固定する。

【0035】

フロアコンセント３に電源線、情報線等の他の芯線が金属線である金属ケーブルの配線のための他の金属線用コンセント部４４を取付ける場合には、上記光ケーブル６の端部を床１の開口部２から床上空間に引出した際に、同時に床下空間５に配線している電源線、情報線等の他の金属ケーブル（図示せず）を開口部２から床上空間にあらかじめ引出しておき、上記のように光ケーブル６の余長部分７をリール８に巻装して断線しないようにした状態でフロアコンセント３を開口部２から挿入して床１に固定した状態で、あらかじめ床上空間に引出している金属ケーブルの先端部を副取付け部１８に取付けた金属線用コンセント部４４の後面部の接続部に接続し、その後、副取付け部１８を開口枠１１の開口から内部に入れて、上取着片２８を開口枠１１の蓋受け周段部１１ａに引っ掛け係止して取付けると共に下取着片２９を主取付け部１７の底部片１９に取付ける（図１１参照）。この場合、図を省略しているが余剰の金属ケーブルは開口枠１１と底部片１９との間の隙間から床下空間５に入れる。このようにして１乃至３個の副取付け部１８を取付けるのであるが、金属ケーブルは折り曲げても断線したりしないので、上記のように余長部分をそのまま又は束ねて床下空間５に押し入れて収納しても断線のおそれなどない。次に、開口枠１１の開口から上方が開口したボックス形状をした内カバー１６をはめ込んで内カバー１６の底面部を底部片１９にねじ具により取付ける。ここで、内カバー１６の側面には開口部１５が設けてあってコンセント部Ａの前端部が該開口部１５に臨んでいる。そして、最後に開口枠１１に蓋５０を着脱自在に取付けるものである。

【0036】

蓋５０の一部には上下反転して着脱自在な小蓋部５１が設けてあり、この小蓋部５１を上下反転して蓋５０に取付けると、床上空間とフロアコンセント３内を連通するケーブル引出し部５２が露出するようになっている。

【0037】

上記のように床１の開口部２に取付けたフロアコンセント３を用いて床上空間（つまり室内）に配置した各種機器に対して光ケーブルによる光配線を行う場合、機器に接続する光ケーブルの端部に設けたプラグをフロアコンセント３に設けた光コンセント部４の前面側に開口するレセプタクル４ｂに接続するものである。なお、機器に対して金属ケーブルによる配線を行う場合は機器に接続する金属ケーブルの端部に設けたプラグをフロアコンセント３に設けた金属線用コンセント部４４に接続するものである。そして、これら光ケーブルや金属ケーブルはフロアコンセント３内から小蓋部５１のケーブル引出し部５２を通して床上空間に引出すものである。

【0038】

なお、ケーブル引出し部５２には切り込みを設けたクッション材を充填してクッション材の切り込み部分から光ケーブルや金属ケーブルを引き出すようにしてもよい。

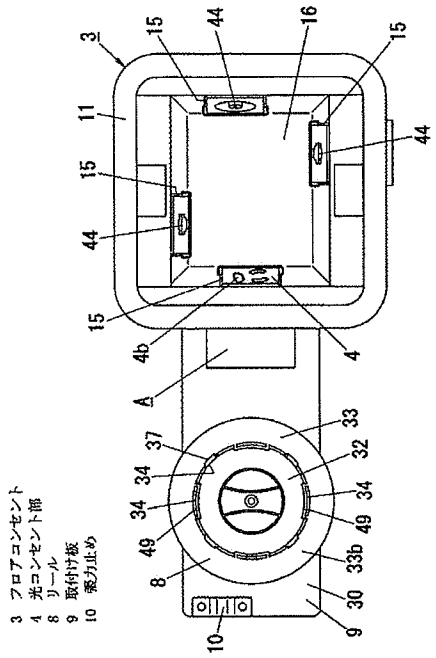
【図面の簡単な説明】

【0039】

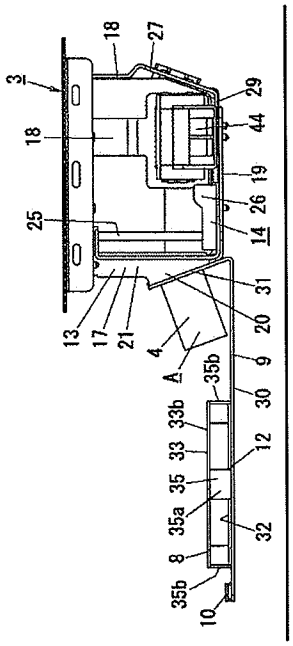
【図1】本発明の床配線装置の平面図である。

【図2】同上の側面図である。
【図3】同上の分解斜視図である。
【図4】同上に用いるリールを設けた取付け板を主取付け部に取着した状態の斜視図である。
【図5】同上に用いるリールを示し、（ａ）はリール部を固定部に近づけた状態のリールの斜視図であり、（ｂ）はリール部を固定部から離した状態のリールの斜視図である。
【図6】同上の施工順序を示す説明図である。
【図7】同上の施工順序を示す説明図である。
【図8】同上の施工順序を示す説明図である。
【図9】同上の施工順序を示す説明図である。
【図10】同上の施工順序を示す説明図である。
【図11】同上の施工順序を示す説明図である。
【符号の説明】
【0040】
１　床
２　開口部
３　フロアコンセント
４　光コンセント部
５　床下空間
６　光ケーブル
７　余長部分
８　リール
９　取付け板
１０　張力止め具

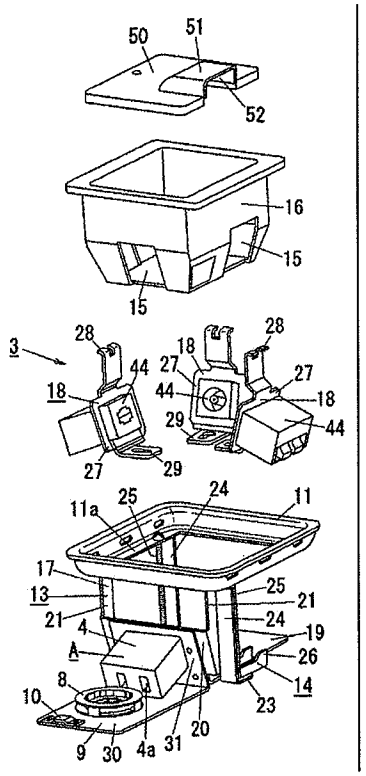
【図1】



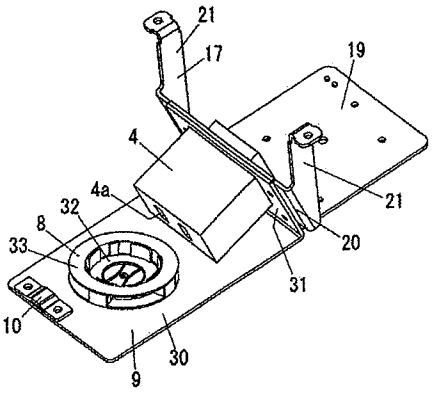
【図2】



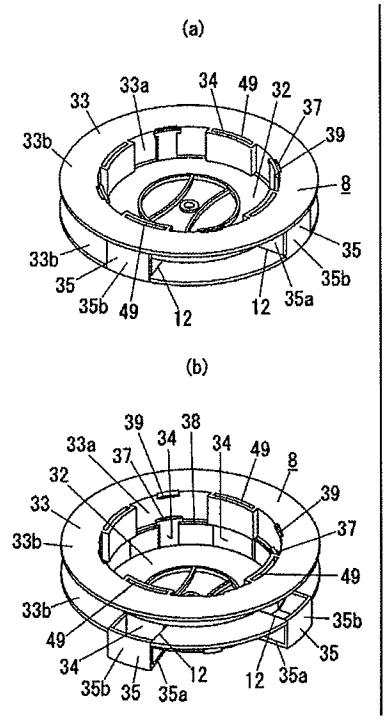
【図3】


50
51
52
16
15
15
3
28
18
44
27
29
28
18
27
44
29
27
18
44
11a
25
24
11
17
13
21
4
A
8
10
9
30
4a
31
20
25
21
24
19
26
14
23

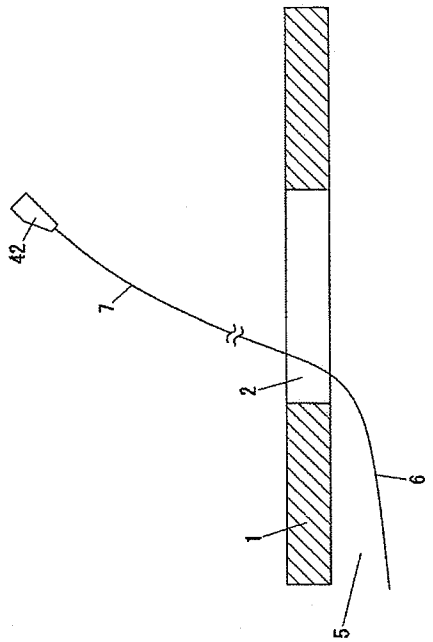
【図4】


21
17
19
4
4a
32
8
33
21
20
31
10
9
30

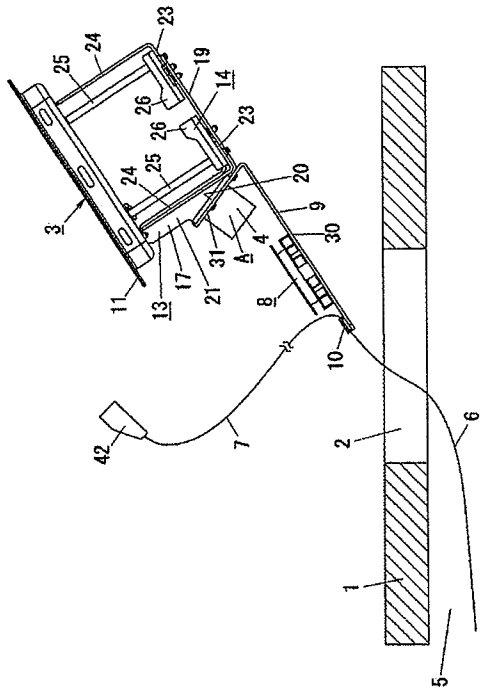
【図5】


(a)
33
33a
34
49
32
37
39
33b
8
35
33b
35
35b
49
12
12
35a
35b
(b)
39
38
34
34
49
8
33a
37
32
33
39
33b
37
49
33b
49
35b
34
35b
35
35a
12
12
35a
35

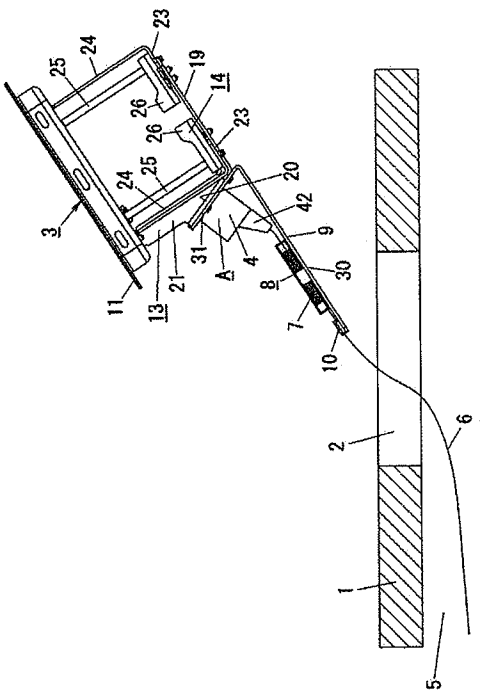
【図6】


42
7
2
6
1
5

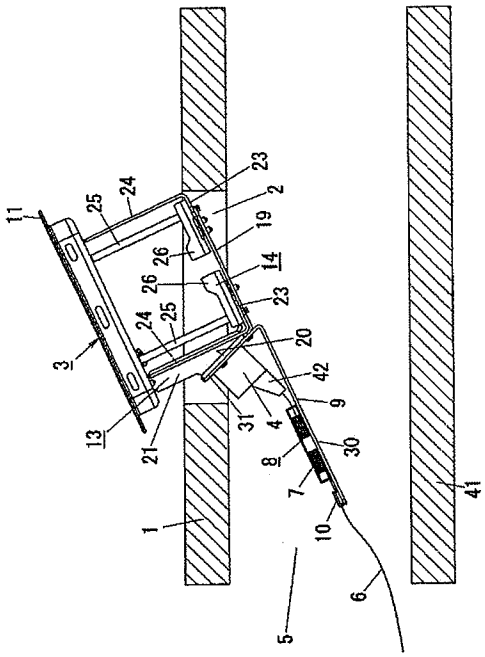
【図7】



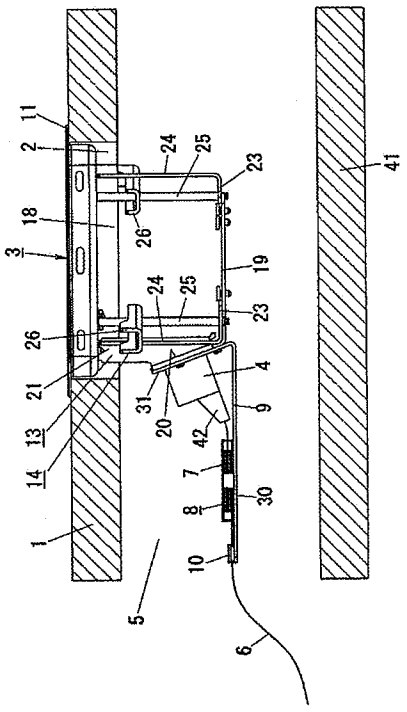
【図8】



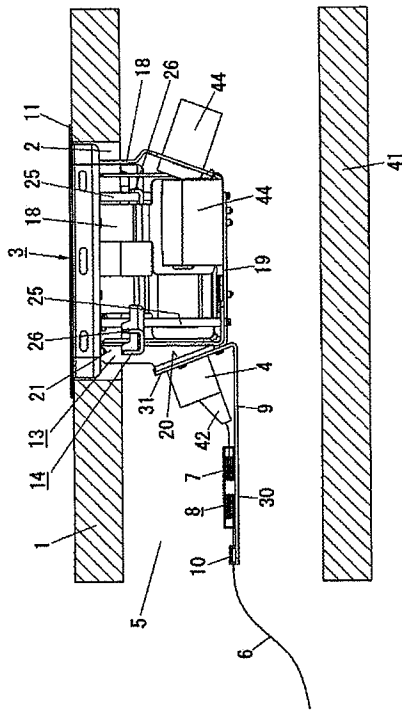
【図9】



【図10】



【図11】



EUROPEAN PATENT OFFICE

Patent Abstracts of Japan

PUBLICATION NUMBER : 2005249858
PUBLICATION DATE : 15-09-05

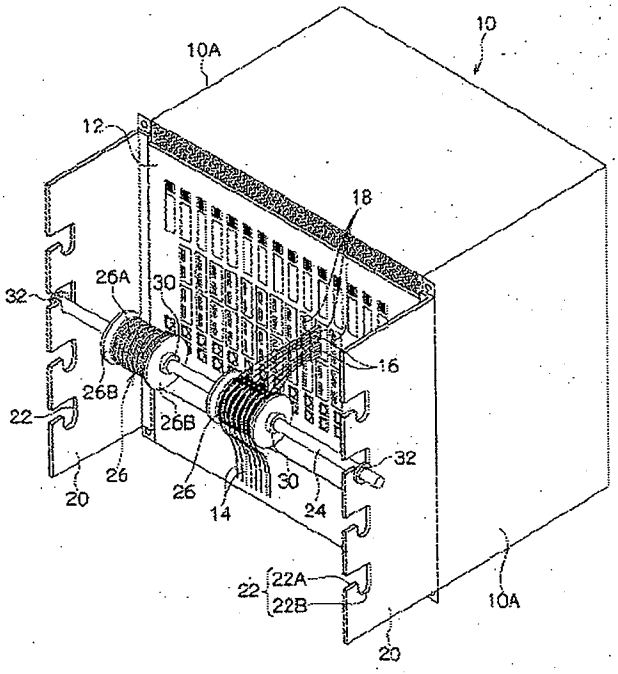
APPLICATION DATE : 01-03-04
APPLICATION NUMBER : 2004056400

APPLICANT : OKI ELECTRIC IND CO LTD;

INVENTOR : TACHIBANA RITSUKO;

INT.CL. : G02B 6/00 H05K 7/00

TITLE : CABLE SUPPORT



ABSTRACT : PROBLEM TO BE SOLVED: To provide a cable support having workability when exchanging a cable of which the excess part will not obstruct, without making the transmission characteristics lowered.

SOLUTION: An optical fiber cable 14 does not have a risk lowering the transmission characteristics, without being bent more than the allowable curvature radius, by forming a groove part 28 of a cable guide 26 winding the slack of the optical fiber cable 14 of a curvature radius of the allowable curvature radius or larger of the optical fiber cable 14. In addition, since the cable guide 26 is rotatably supported on a guide shaft 24, the length of the excess part is adjusted by rotating the cable guide 26, in a state in which the cable guide 26 is inserted in the guide shaft 24, and the replacement work of the cable 14 is facilitated.

COPYRIGHT: (C)2005,JPO&NCIPI

(19)日本国特許庁(JP)　(12)公開特許公報(A)　(11)特許出願公開番号
特開2005-249858
(P2005-249858A)
(43)公開日　平成17年9月15日(2005.9.15)

(51)Int.Cl.[7]	F I			テーマコード（参考）
G02B 6/00	G02B	6/00	336	2H038
H05K 7/00	H05K	7/00	E	4E352

審査請求 未請求　請求項の数 7　OL　（全 10 頁）

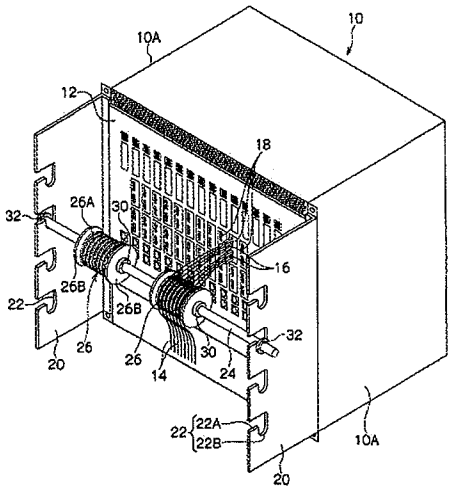
(21)出願番号　特願2004-56400(P2004-56400)
(22)出願日　平成16年3月1日(2004.3.1)

(71)出願人　000000295
沖電気工業株式会社
東京都港区虎ノ門１丁目７番１２号
(74)代理人　100079049
弁理士　中島　淳
(74)代理人　100084995
弁理士　加藤　和詳
(74)代理人　100085279
弁理士　西元　勝一
(74)代理人　100099025
弁理士　福田　浩志
(72)発明者　斉藤　久志
東京都港区虎ノ門１丁目７番１２号　沖電気工業株式会社内

最終頁に続く

(54)【発明の名称】ケーブルサポート

(57)【要約】
【課題】　伝送特性を低下させることなく、また、ケーブルの余長分が邪魔にならず、ケーブル交換の際の作業性が良いケーブルサポートを得る。
【解決手段】　光ファイバケーブル１４の余長を巻付けるケーブルガイド２６の溝部２８を光ファイバケーブル１４の許容曲率半径以上の曲率半径で形成することで、光ファイバケーブル１４には許容曲率半径よりも屈曲することはなく、伝送特性を低下させる恐れはない。また、ケーブルガイド２６はガイドシャフト２４に回転可能に支持されているため、ケーブルガイド２６をガイドシャフト２４に挿通させた状態で、ケーブルガイド２６を回転させるだけで、余長分の長さ調整を行なうことができる。さらに、ケーブルガイド２６をガイドシャフト２４の軸方向へ沿ってスライドさせることで、作業領域を確保することができ、光ファイバケーブル１４の交換作業を容易に行うことができる。
【選択図】　図1



【特許請求の範囲】
【請求項1】
回路基板が実装されたユニット搭載枠の前方へ突出する一対のサポート部材と、
前記サポート部材に両端が支持されたガイドシャフトと、
前記ガイドシャフトに回転可能に支持され、前記回路基板に接続されたケーブルの許容曲率半径以上の曲率半径で形成され余長ケーブルを個々に巻付け可能な周溝が設けられたケーブルガイドと、
を有することを特徴とするケーブルサポート。
【請求項2】
前記サポート部材に前記ガイドシャフトが嵌合可能な切欠き部をサポート部材の高さ方向に複数形成したことを特徴とする請求項１に記載のケーブルサポート。
【請求項3】
前記ガイドシャフトが前記切欠き部に嵌合された状態で、ガイドシャフトの軸線方向への移動を規制する止め部材を備えたことを特徴とする請求項１又は２に記載のケーブルサポート。
【請求項4】
前記ケーブルガイドが、前記ガイドシャフトの軸方向にスライド可能な複数のドラムで構成されたことを特徴とする請求項１～３の何れか１項に記載のケーブルサポート。
【請求項5】
前記周溝が前記ドラムに対して単数または複数形成され、前記ケーブルを個々に巻付け可能なことを特徴とする請求項４に記載のケーブルサポート。
【請求項6】
前記ドラムの両側に、ケーブルガイドに巻付けられたケーブルの逸脱を防止するフランジが設けられたことを特徴とする請求項４又は５に記載のケーブルサポート。
【請求項7】
前記ドラムを前記ガイドシャフトに対して滑り易くしていることを特徴とする請求項４～６の何れか１項に記載のケーブルサポート。

【発明の詳細な説明】
【技術分野】
【0001】
本発明は、例えば通信機器に接続する光ファイバ等のケーブルを所定の方向へガイドして支持するケーブルサポートに関する。
【背景技術】
【0002】
伝送路として光ファイバケーブルを用いた電子装置において、光ファイバケーブルを配線する際、配線方向を変えるときに屈曲部が生じるが、この屈曲部において、光ファイバケーブルの許容曲げ半径より小さい曲げ半径で屈曲した場合、光ファイバーケーブルの伝送特性が低下する恐れがあった。
【0003】
このため、特許文献１では、図４に示すように、電子装置１００に用いられる光ファイバケーブル１０２の配線において、光ファイバケーブル１０２が屈曲する屈曲部に、光ファイバケーブル１０２の許容曲げ半径よりも大きいRを有するガイド部材１０４、１０６を取り付け、光ファイバケーブル１０２が許容曲げ半径よりも屈曲しないようにしている。
【0004】
また、電子装置１００の両側壁から支持板１０８を張出させ、許容曲げ半径の２倍以上の外径を有する棒状体１１０を支持板１０８に固定し、光ファイバケーブル１０２の余長（光ファイバケーブル１０２に直接テンションが掛からないように光ファイバケーブル１０２を弛ませるために必要な光ファイバケーブル１０２の長さ）を所定の曲げ半径以上で巻回して、余長分の光ファイバケーブル１０２が邪魔にならないようにすると共に、光フ

ァイバケーブル１０２が許容曲げ半径よりも屈曲しないようにしている。
【0005】
しかしながら、特許文献１では、光ファイバケーブル１０２の余長分が巻回された棒状体１１０が、電子装置１００の前面を架け渡した状態で配置されているため、光ファイバケーブル１０２の交換の際、棒状体１１０が邪魔になり作業性が良くない。
【特許文献1】特開平９－５５３５号公報
【発明の開示】
【発明が解決しようとする課題】
【0006】
本発明は上記事実を考慮し、伝送特性を低下させることなく、また、ケーブルの余長分が邪魔にならず、ケーブル交換の際の作業性が良いケーブルサポートを提供することを目的とする。
【課題を解決するための手段】
【0007】
請求項１に記載の発明は、回路基板が実装されたユニット搭載枠の前方へ突出する一対のサポート部材と、前記サポート部材に両端が支持されたガイドシャフトと、前記ガイドシャフトに回転可能に支持され、前記回路基板に接続されたケーブルの許容曲率半径以上の曲率半径で形成されて余長ケーブルを個々に巻付け可能な周溝が設けられたケーブルガイドと、を有することを特徴としている。
【0008】
請求項１に記載の発明では、回路基板が実装されたユニット搭載枠に前方へ突出する一対のサポート部材を設けており、サポート部材でガイドシャフトの両端部を支持している。このガイドシャフトに、周溝を設けたケーブルガイドを回転可能に支持させる。ここで、周溝を回路基板に接続されたケーブルの許容曲率半径以上の曲率半径で形成し、余長ケーブルを個々に巻付け可能としている。
【0009】
このように、余長ケーブルを巻付け可能なケーブルガイドをガイドシャフトに回転可能に支持させることで、ケーブルガイドをガイドシャフトに挿通させた状態でケーブルガイドを回転させるだけで、余長ケーブルの長さ調整を行なうことができるため、便利である。また、ケーブルを個々に巻付け可能とすることで、ケーブルの交換の際、交換対象のケーブルを一目で確認でき、所望のケーブルの脱着を確実に実施することができる。
【0010】
さらに、周溝をケーブルの許容曲率半径以上の曲率半径で形成することで、周溝に余長ケーブルを巻付けた状態で、ケーブルには許容曲率半径よりも屈曲することはない。このため、ケーブルには過度の負荷が掛からず、安定保持させることができる。従って、伝送特性を低下させる恐れはない。
【0011】
また、ユニット搭載枠に前方へ突出するサポート部材を設け、このサポート部材で支持するガイドシャフトにケーブルガイドを設けることで、回路基板の前面側にケーブルガイドが配置されることとなる。このため、回路基板の前面側からコネクタの挿抜操作や保守および回線増設等を行うことができ、作業性が向上すると共にケーブルの余長処理面積を少なくすることができるという効果がある。
【0012】
請求項２に記載の発明は、請求項１に記載のケーブルサポートにおいて、前記サポート部材に前記ガイドシャフトが嵌合可能な切欠き部をサポート部材の高さ方向に複数形成したことを特徴としている。
【0013】
請求項２に記載の発明では、ガイドシャフトが嵌合可能な切欠き部をサポート部材の高さ方向で複数形成することで、回路基板の前面側からコネクタの挿抜操作や保守および回線増設等を行う際、ケーブルガイドをスライドさせても作業領域を確保できないという場

合でも、ガイドシャフトごと別の切欠き部に嵌め込むことで、一度接続されたケーブルを外すことなく作業領域を臨機応変に確保することができる。

【0014】

請求項３に記載の発明は、請求項１又は２に記載のケーブルサポートにおいて、前記ガイドシャフトが前記切欠き部に嵌合された状態で、ガイドシャフトの軸線方向への移動を規制する止め部材を備えたことを特徴としている。

【0015】

請求項３に記載の発明では、止め部材によって、ガイドシャフトの軸線方向への移動を規制することで、コネクタの挿抜操作や保守および回線増設等を行う際に、誤ってガイドシャフトがケーブルサポートから抜けることがないようにしている。

【0016】

請求項４に記載の発明は、請求項１～３の何れか１項に記載のケーブルサポートにおいて、前記ケーブルガイドが前記ガイドシャフトの軸方向にスライド可能な複数のドラムで構成されたことを特徴としている。

【0017】

請求項４に記載の発明では、ケーブルガイドをガイドシャフトの軸方向にスライド可能な複数のドラムで構成することで、ケーブル交換の際、ドラムをスライドさせ、作業領域を広くすることができる。このため、既に接続されたケーブルと干渉しないように作業することができると共に、ケーブルの交換作業を容易に行うことができる。

【0018】

請求項５に記載の発明は、請求項４に記載のケーブルサポートにおいて、前記周溝が前記ドラムに対して単数または複数形成され、前記ケーブルを個々に巻付け可能なことを特徴としている。

【0019】

請求項５に記載の発明では、周溝をドラムに対して単数または複数形成し、ケーブルを個々に巻付け可能とすることで、ケーブル交換の際、交換対象のケーブルを一目で確認することができ、所望のケーブルの脱着を確実に実施することができる。

【0020】

請求項６に記載の発明は、請求項４又は５に記載のケーブルサポートにおいて、前記ドラムの両側に、ドラムに巻付けられたケーブルの逸脱を防止するフランジが設けられたことを特徴としている。

【0021】

請求項６に記載の発明では、ドラムの両側に、ドラムに巻付けられたケーブルの逸脱を防止するフランジを設けることで、ケーブル交換の際、或いはドラムをガイドシャフトの軸方向に沿ってスライドさせたとき、ケーブルをドラムから逸脱しないように安定保持させることができる。

【0022】

請求項７に記載の発明は、請求項４～６の何れか１項に記載のケーブルサポートにおいて、前記ドラムを前記ガイドシャフトに対して滑り易くしていることを特徴としている。

【0023】

請求項７に記載の発明では、ドラムをガイドシャフトに対して滑り易くすることで、ドラムとガイドシャフトの摩擦抵抗を小さくし、ドラムを容易にスライドさせることができるようにしている。

【発明の効果】

【0024】

本発明は、上記構成としたので、請求項１に記載の発明では、余長ケーブルを巻付け可能なケーブルガイドをガイドシャフトに回転可能に支持させることで、ケーブルガイドをガイドシャフトに挿通させた状態でケーブルガイドを回転させるだけで、余長ケーブルの長さ調整を行なうことができるため、便利である。また、ケーブルを個々に巻付け可能とすることで、ケーブルの交換の際、交換対象のケーブルを一目で確認でき、所望のケーブ

ルの脱着を確実に実施することができる。

【0025】

さらに、周溝をケーブルの許容曲率半径以上の曲率半径で形成することで、周溝に余長ケーブルを巻付けた状態で、ケーブルには許容曲率半径よりも屈曲することはない。このため、ケーブルには過度の負荷が掛からず、安定保持させることができる。従って、伝送特性を低下させる恐れはない。

【0026】

また、ユニット搭載枠に前方へ突出するサポート部材を設け、このサポート部材で支持するガイドシャフトにケーブルガイドを設けることで、回路基板の前面側にケーブルガイドが配置されることとなる。このため、回路基板の前面側からコネクタの挿抜操作や保守および回線増設等を行うことができ、作業性が向上すると共にケーブルの余長処理面積を少なくすることができるという効果がある。

【0027】

請求項２に記載の発明では、回路基板の前面側からコネクタの挿抜操作や保守および回線増設等を行う際、ケーブルガイドをスライドさせても作業領域を確保できないという場合でも、ガイドシャフトごと別の切欠き部に嵌め込むことで、一度接続されたケーブルを外すことなく作業領域を臨機応変に確保することができる。

【0028】

請求項３に記載の発明では、コネクタの挿抜操作や保守および回線増設等を行う際に、誤ってガイドシャフトがケーブルサポートから抜けることがないようにしている。

【0029】

請求項４に記載の発明では、ケーブル交換の際、ドラムをスライドさせ、作業領域を広くすることができるため、既に接続されたケーブルと干渉しないように作業することができると共に、ケーブルの交換作業を容易に行うことができる。

【0030】

請求項５に記載の発明では、ケーブル交換の際、交換対象のケーブルを一目で確認することができ、所望のケーブルの脱着を確実に実施することができる。

【0031】

請求項６に記載の発明では、ケーブル交換の際、或いはドラムをガイドシャフトの軸方向に沿ってスライドさせたとき、ケーブルをドラムから逸脱しないように安定保持させることができる。

【0032】

請求項７に記載の発明では、ドラムとガイドシャフトの摩擦抵抗を小さくし、ドラムを容易にスライドさせることができるようにしている。

【発明を実施するための最良の形態】

【0033】

次に、図１～図３(Ａ)、（Ｂ）を参照して、本発明の実施の形態に係るケーブルサポートについて説明する。

【0034】

図１及び図２には、ケーブルサポートが適用されたユニット搭載枠の斜視図が示されており、図３（Ａ）にはケーブルガイドの平面図、図３（Ｂ）にはケーブルガイドの斜視図が示されている。

【0035】

図１に示すように、ユニット搭載枠１０は箱状を成しており、ユニット搭載枠１０内には複数の回路基板１２が収納されている。この回路基板１２には、光ファイバケーブル１４の端部に配設されたコネクタ部１６が接続されるコネクタ部１８が複数配設されている。

【0036】

また、ユニット搭載枠１０の側壁１０Ａからは、一対の板状のサポート部材２０がユニット搭載枠１０の前方（回路基板１２側）へ向かって互いに対面した状態で張出している

。このサポート部材２０の先端部には、サポート部材２０の高さ方向に沿って任意の間隔で切欠き部２２が形成されており、対面するサポート部材２０の切欠き部２２同士の高さは略同一となっている。

【0037】

この切欠き部２２は入口部２２Ａから下方へ向かって略直角に折れ曲がった形状をしており、奥部には曲面部２２Ｂが形成されている。切欠き部２２にはガイドシャフト２４が挿通可能となっており、入口部２２Ａから挿通され、曲面部２２Ｂで支持される。

【0038】

曲面部２２Ｂの曲率半径は、ガイドシャフト２４の曲率半径と略同一となっており、ガイドシャフト２４の両端部を曲面部２２Ｂに面接触させた状態で、ガイドシャフト２４と曲面部２２Ｂとは嵌合し、ガイドシャフト２４は固定される。この状態で、ガイドシャフト２４は回路基板１２の前面側に配置されることになる。

【0039】

また、ガイドシャフト２４にはドラム型のケーブルガイド２６が２つ挿通されており、ガイドシャフト２４に対して回転可能に支持されると共に、ガイドシャフト２４に対してスライド可能となっている。このケーブルガイド２６の外周面２６Ａ（以下、「ガイド面２６Ａ」という）には、図３(Ａ)、（Ｂ）に示すように、ガイド面２６Ａの周方向に沿って複数の溝部２８が凹設されている。

【0040】

この溝部２８の曲率半径は、ケーブルガイド２６の許容曲率半径以上となるように形成されており、光ファイバケーブル１４を１本ずつ個別に巻付け可能な大きさとしている。このため、ガイド面２６Ａに１つの溝部２８を形成し、光ファイバケーブル１４が１本のみ収容できるようにしても良い。

【0041】

また、ケーブルガイド２６の両端部には、円盤状のフランジ２６Ｂが一体成形されており、溝部２８に巻付けられた光ファイバケーブル１４の逸脱を防止する。さらに、ケーブルガイド２６の内周面には、ガイドシャフト２４との摺動性を高めるため、スラスト軸受３０を設けている。このスラスト軸受３０はジュラコン（ポリプラスチック社の登録商標）以外の樹脂や含油メタル等で形成しても良い。

【0042】

なお、ケーブルガイド２６をポリアセタール（例えば、ジュラコン（ポリプラスチック社の登録商標））等のように摺動性の高い樹脂で成形することで、ガイドシャフト２４との摩擦係数を小さくしても良い。

【0043】

次に、本発明の実施の形態に係るケーブルサポートの作用について説明する。

【0044】

図１に示すように、回路基板１２の前面に光ファイバケーブル１４のコネクタ部１６を回路基板１２側に配設されたコネクタ部１８に接続する際、所望の光ファイバケーブル１４をケーブルガイド２６のガイド面２６Ａの溝部２８に巻付ける。これにより、光ファイバケーブル１４の余長（光ファイバケーブル１４に直接テンションが掛からないように光ファイバケーブル１４を弛ませるために必要な光ファイバケーブル１４の長さ）分が邪魔にならないようにしている。

【0045】

ここで、ケーブルガイド２６はガイドシャフト２４に回転可能に支持されているため、ケーブルガイド２６をガイドシャフト２４に挿通させた状態で、ケーブルガイド２６を回転させるだけで、余長分の長さ調整を行なうことができる。

【0046】

また、ケーブルガイド２６のガイド面２６Ａには、複数の溝部２８が凹設されているため、一つのケーブルガイド２６に対して複数本の光ファイバケーブル１４を巻付けることが可能であり、回路基板１２にコネクタ接続された光ファイバケーブル１４の本数に対し

てケーブルガイド２６の個数を少なくすることができる。

【0047】

光ファイバケーブル１４をケーブルガイド２６のガイド面２６Ａの溝部２８に巻付けるとき、光ファイバケーブル１４のコネクタ部１６側では任意の余長を残すようにしておく。これにより、光ファイバケーブル１４に掛かる負荷は余長分の自重のみとなり、光ファイバケーブル１４に必要以上の負荷が掛かることによって生じる損傷を防止することができる。

【0048】

ここで、溝部２８を光ファイバケーブル１４の許容曲率半径以上の曲率半径で形成することで、溝部２８に余長を巻付けた状態で、光ファイバケーブル１４には許容曲率半径よりも屈曲することはない。このため、光ファイバケーブル１４には屈曲による過度の負荷が掛からず、安定保持させることができる。従って、伝送特性を低下させる恐れはない。

【0049】

また、溝部２８に光ファイバケーブル１４を１本ずつ個別に巻付け可能とすることで、光ファイバケーブル１４の交換の際、交換対象の光ファイバケーブル１４を一目で確認でき、所望の光ファイバケーブル１４の脱着を確実に実施することができる。

【0050】

光ファイバケーブル１４をケーブルガイド２６のガイド面２６Ａの溝部２８に巻付けた後、ガイドシャフト２４を、回路基板１２側のコネクタ部１８の高さに近い位置に持ち上げ、サポート部材２０に設けられた切欠き部２２に嵌め込む。そして、光ファイバケーブル１４のコネクタ部１６を回路基板１２のコネクタ部１８に接続する。

【0051】

このとき、残しておいた余長が短い場合は、ケーブルガイド２６を回転させることで、余長を増やすことができ、これにより、光ファイバケーブル１４にテンションが掛かることを防止することができる。また、残しておいた余長が長すぎる場合は、ケーブルガイド２６を前記と逆方向に回転させて余長長さを調節する。

【0052】

一方、光ファイバケーブル１４の交換の際は、回路基板１２のコネクタ部１８から光ファイバケーブル１４のコネクタ部１６を引き抜いた後、交換対象となる光ファイバケーブル１４をケーブルガイド２６からほどく。

【0053】

ここで、ユニット搭載枠１０に前方へ突出するサポート部材２０を設け、このサポート部材２０で支持するガイドシャフト２４にケーブルガイド２６を取付けることで、回路基板１２の前面側にケーブルガイド２６が配置されることとなる。

【0054】

このため、回路基板１２の前面側からコネクタ部１８の挿抜操作や保守および回線増設等を行うことができ、作業性が向上すると共に光ファイバケーブル１４の余長処理面積を少なくすることができるという効果がある。

【0055】

また、ケーブルガイド２６をガイドシャフト２４に対し横方向へスライド可能に設けることで、光ファイバケーブル１４の取り外し時に、既に接続された光ファイバケーブル１４と干渉しないようにケーブルガイド２６をスライド移動させることができ、光ファイバケーブル１４の交換作業を容易に行うことができる。

【0056】

さらに、コネクタ部１８の挿抜操作や保守および回線増設等の作業時に、ケーブルガイド２６をガイドシャフト２４の軸方向へ沿ってスライドさせることで、作業領域を確保することができる。このため、光ファイバケーブル１４の交換作業を容易に行うことができる。

【0057】

ここで、ケーブルガイド２６の内周面には、スラスト軸受３０を設けているため、ガイ

ドシャフト２４に対して滑り易くなっている。このため、ケーブルガイド２６を容易にスライドさせることができる。

【0058】

また、ケーブルガイド２６の両端部には、円盤状のフランジ２６Ｂを設け、溝部２８に巻付けられた光ファイバケーブル１４の逸脱を防止するようにしているため、光ファイバケーブル１４交換の際、或いはケーブルガイド２６をガイドシャフト２４の軸方向へ沿ってスライドさせるときに、光ファイバケーブル１４をケーブルガイド２６から逸脱させることなく移動させることができる。

【0059】

なお、ガイドシャフト２４の両端部にＥリング３２を嵌めて、ガイドシャフト２４が軸線方向へ移動しないようにする。これにより、コネクタ部１６の挿抜操作や保守および回線増設等を行う際に、誤ってガイドシャフト２４がサポート部材２０から抜けることはない。

【0060】

ところで、ケーブルガイド２６をガイドシャフト２４の軸方向へ沿ってスライドさせても、作業領域を十分に確保できない場合は、ケーブルガイド２６を回転させ、光ファイバケーブル１４の余長を十分確保した後、図２に示すように、ガイドシャフト２４をサポート部材２０に設けられた別の切欠き部２２に嵌め込むことで、作業領域を確保することができる。これにより、一度接続された光ファイバケーブル１４を外すことなく作業を行なうことができる。

【0061】

なお、ここでは、ケーブルガイド２６を１本のガイドシャフトに対して２つ用いたが、２つに限るものでなく、光ファイバケーブル１４の本数に対応してケーブルガイド２６を増減させることができ、ケーブルガイド２６の無駄を少なくすることができる。また、ここでは、光ファイバケーブルについて説明したが、光ファイバー用のケーブルに限るものではない。

【図面の簡単な説明】

【0062】

【図1】本発明の実施の形態に係るケーブルサポートが適用されたユニット搭載枠の斜視図である。

【図2】本発明の実施の形態に係るケーブルサポートが適用されたユニット搭載枠の斜視図である。

【図3】（Ａ）はケーブルガイドの平面図であり、（Ｂ）はケーブルガイドの斜視図である。

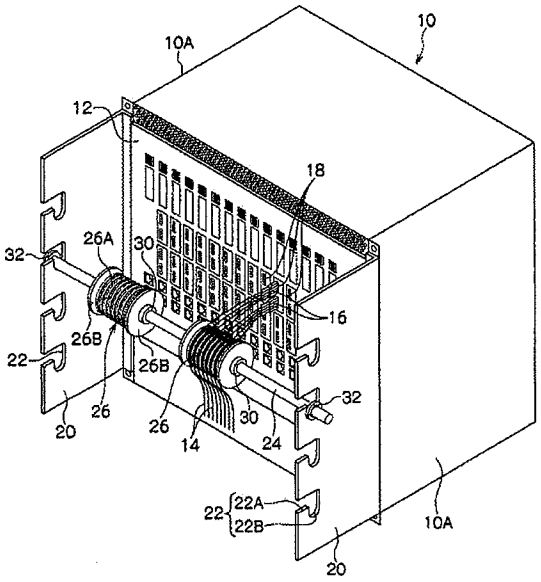
【図4】従来のケーブルサポートを示す斜視図である（特許文献１）。

【符号の説明】

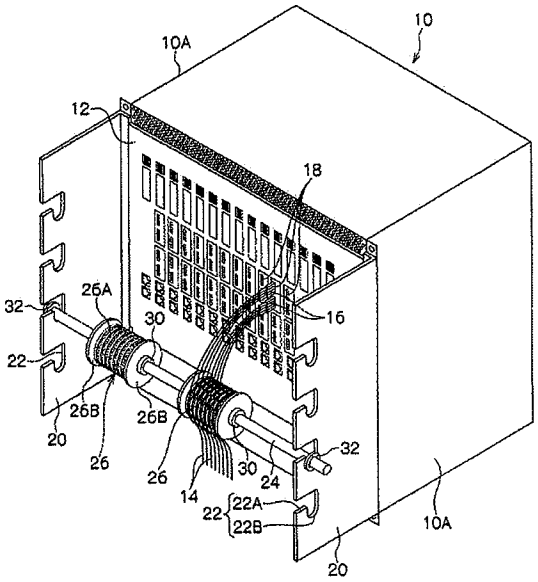
【0063】

１０　ユニット搭載枠
２０　サポート部材（ケーブルサポート）
２２　切欠き部
２４　ガイドシャフト（ケーブルサポート）
２６　ケーブルガイド（ケーブルサポート、ドラム）
２６Ｂ　フランジ
２８　溝部（周溝）
３０　スラスト軸受
３２　Ｅリング（止め部材）

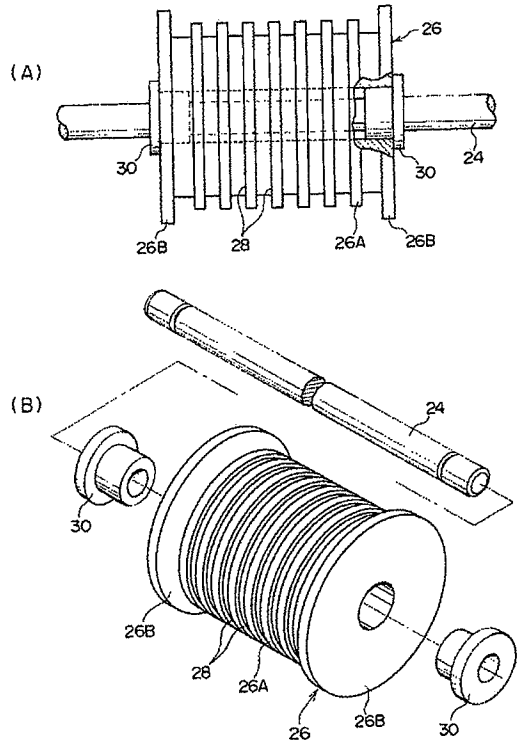
【図1】


10
10A
12
18
32
26A
30
16
22
26B
26B
26
20
26
14
30
24
32
22
22A
22B
10A
20

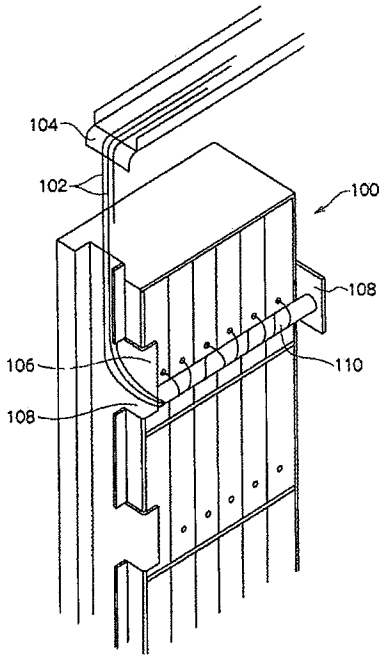
【図2】


10
10A
12
18
32
26A
30
16
22
26B
26B
20
26
26
14
30
24
32
22
22A
22B
10A
20

【図3】


(A)
26
30
30
24
26B
28
26A
26B
(B)
24
30
26B
28
26A
26
26B
30

【図4】


104
102
100
108
106
110
108

(72)発明者　橘　律子
東京都港区虎ノ門１丁目７番１２号　沖電気工業株式会社内

Ｆターム(参考) 2H038 CA35 CA37 CA38
4E352 AA08 BB04 CC02 CC22 CC52 DD07 DD08 DD09 DR02 DR07
DR14 DR18 DR23 DR34 DR42 DR46 EE03 FF09 GG13 GG15
GG20

Electronic Acknowledgement Receipt

EFS ID:	3894938
Application Number:	12182705
International Application Number:	
Confirmation Number:	4252
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
Customer Number:	23552
Filer:	David G. Schmaltz/Kristine Wacek
Filer Authorized By:	David G. Schmaltz
Attorney Docket Number:	02316.2584USU2
Receipt Date:	05-SEP-2008
Filing Date:	30-JUL-2008
Time Stamp:	14:27:19
Application Type:	Utility under 35 USC 111(a)

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	Information Disclosure Statement Letter	P-IDS.PDF	77042 76484ffe4a825613b87ae4d1bd8b88f061179ccf	no	2

Warnings:	
Information:	

2	Information Disclosure Statement (IDS) Filed (SB/08)	P-1449.PDF	54146 41e54f095b8f3098cbb20a01db3edc49a821f1ae	no	1
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Foreign Reference	DE4226368-with-English-Abstract.PDF	822006 2e596ac5feeabdfb385a87a96a3a67208623ccc8	no	14
Warnings:					
Information:					
4	Foreign Reference	JP9236709-with-English-Abstract.PDF	590558 d07dbfc64f85a67ed2d5b380f7a3a7fa34d777ac	no	8
Warnings:					
Information:					
5	Foreign Reference	JP11349230-with-English-Abstract.PDF	549921 187c26165b2f97e46be1fb5c874abde6cd47dc02	no	8
Warnings:					
Information:					
6	Foreign Reference	JP200573365-with-English-Abstract.PDF	643936 affad13c2fcbce360fe9370e915bc8f34ce2eb5e	no	13
Warnings:					
Information:					
7	Foreign Reference	JP2005249858-with-English-Abstract.PDF	574720 4a43c82cd2956b427fcc72b4f7d64ad8cb09b459	no	11
Warnings:					
Information:					
8	NPL Documents	International-Search-Report-mailed-08-08-2008.PDF	816533 457ba6044975cff25388b80b30269e1e2236b8f1	no	17
Warnings:					
Information:					
		Total Files Size (in bytes):	4128862		

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
12/182,705	07/30/2008	2874	1030	02316.2584USU2	17	2

CONFIRMATION NO. 4252

23552
MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

FILING RECEIPT



Date Mailed: 09/02/2008

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

Applicant(s)

Scott C. Kowalczyk, Savage, MN;
Jonathan Walter Coan, Savage, MN;
Jonathan Kaml, Shakopee, MN;

Assignment For Published Patent Application

ADC Telecommunications, Inc., Eden Prairie, MN

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 60/954,214 08/06/2007
and claims benefit of 61/029,248 02/15/2008

Foreign Applications

If Required, Foreign Filing License Granted: 08/28/2008

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/182,705**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No

Title

FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

Preliminary Class

385

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 (1-866-999-4158).

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).

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
12/182,705	07/30/2008	Scott C. Kowalczyk	02316.2584USU2

CONFIRMATION NO. 4252

23552
MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

FORMALITIES LETTER

OC000000031816729

Date Mailed: 09/02/2008

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The oath or declaration is unsigned.

The application is informal since it does not comply with the regulations for the reason(s) indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121(d) are required. The drawings submitted are not acceptable because:
  - The drawings must be reasonably free from erasures and must be free from alterations, overwriting, interlineations, folds, and copy marks. See Figure(s) 17,18.

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of $**130** for a non-small entity, must be submitted with the missing items identified in this notice.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is $**130** for a non-small entity
- $**130** Surcharge.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/bzewdie/

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Kowalcayk et al.
Docket:	02316.2584USU2
Title:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

Filed EFS-WEB

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

We are transmitting herewith the attached:

- ☒ Transmittal sheet
- ☒ Utility Patent Application: Spec. 12 pgs; 17 claims; Abstract 1 pg.
  The fee has been calculated as shown below in the 'Claims as Filed' table.
- ☒ 14 sheets of informal drawings
- ☒ An unsigned Combined Declaration and Power of Attorney
- ☒ Application Data Sheet, 4 pages.

CLAIMS AS FILED

Number of Claims Filed	No.	In Excess of		Extra		Rate		Fee
Total Claims	17	20		0		50.00	=	0.00
Independent Claims	2	3		0		210.00	=	0.00
Multiple Dependent Claims Fee							=	0.00
Basic Filing Fee							=	310.00
Search Fee							=	510.00
Examination Fee							=	210.00
Utility Application Size Fee	0	100		0			=	0
Total							=	1030.00

Please charge any additional fees or credit overpayment to Deposit Account No. 13-2725. A duplicate of this sheet is enclosed.

Merchant & Gould P.C.
P.O. Box 2903 Minneapolis, MN 55402-0903
612.332.5300

By: /Jarett D. Millar/
Name: Jarett D. Millar
Reg. No.: 57,679
Initials: JDM:jrm

23552
PATENT TRADEMARK OFFICE

FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

Cross-Reference to Related Application

This application claims the benefit of U.S. Provisional Patent Application Serial Nos. 60/954,214, filed August 6, 2007 and 61/029,248, filed on February 15, 2008, both of which are hereby incorporated by reference in their entirety.

Technical Field

The present disclosure relates to fiber optic enclosure, and more particularly, to a fiber optic enclosure with cable payout.

Background

As demand for telecommunications increases, fiber optic networks are being extended in more and more areas. In facilities such as multiple dwelling units, apartments, condominiums, businesses, etc., fiber optic enclosures are used to provide a subscriber access point to the fiber optic network. These fiber optic enclosures are connected to the fiber optic network through subscriber cables connected to a network hub. However, the length of subscriber cable needed between the fiber optic enclosure and the network hub varies depending upon the location of the fiber optic enclosure with respect to the network hub. As a result, there is a need for a fiber optic enclosure that can effectively manage varying lengths of subscriber cable.

Summary

An aspect of the present disclosure relates to a fiber optic enclosure assembly for enclosing optical fiber connections. The fiber optic enclosure assembly includes a housing having an interior region and a bearing mount disposed in the interior region of the housing. A cable spool is connectedly engaged with the bearing mount such that the cable spool selectively rotates within the housing. A termination

module is disposed on the cable spool so that the termination module rotates in unison with the cable spool.

Another aspect of the present disclosure relates to a method of paying out a fiber optic cable from a fiber optic enclosure. The method includes rotating a cable spool, which has a subscriber cable coiled around a spooling portion of the cable spool, about an axis of a housing of the fiber optic enclosure until a desired length of subscriber cable is paid out. The cable spool is disposed in an interior region of the fiber optic enclosure and a termination module is disposed on the cable spool.

A variety of additional aspects will be set forth in the description that follows. These aspects can relate to individual features and to combinations of features. It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the broad concepts upon which the embodiments disclosed herein are based.

Description of the Drawings

FIG. 1 is a schematic representation of a fiber optic network that includes a fiber optic enclosure having features that are examples of inventive aspects in accordance with the principles of the present disclosure.

FIG. 2 is an isometric view of the fiber optic enclosure of FIG. 1.

FIG. 3 is an isometric view of the fiber optic enclosure of FIG. 2 with a cover in an open position.

FIG. 4 is a front view of the fiber optic enclosure of FIG. 2 with the cover in the open position.

FIG. 5 is an exploded isometric view of the fiber optic enclosure of FIG. 2.

FIG. 6 is a perspective view of a fiber optic adapter suitable for use within the fiber optic enclosure of FIG. 2.

FIG. 7 is a cross-sectional view of the fiber optic adapter taken on line 7-7 of FIG. 6.

FIG. 8 is an isometric view of another embodiment of a fiber optic enclosure.

FIG. 9 is a front view of the fiber optic enclosure of FIG. 8.

FIG. 10 is a top view of the fiber optic enclosure of FIG. 8.

FIG. 11 is a side view of the fiber optic enclosure of FIG. 8.

FIG. 12 is an isometric view of the fiber optic enclosure of FIG. 8, showing cables entering and exiting the enclosure.

FIG. 13 is an isometric view of the fiber optic enclosure of FIG. 12 without the cover.

FIG. 14 is a front view of the fiber optic enclosure of FIG. 13.

FIG. 15 is an exploded isometric view of the fiber optic enclosure of FIG. 13.

FIG. 16 is an isometric view of the cable spool of the fiber optic enclosure of FIG. 13.

FIG. 17 is a further isometric view of the fiber optic enclosure of FIG. 12, with the cover in the pivoted open position.

FIG. 18 is an exploded view of a shipping container in which is disposed the fiber optic enclosure of FIG. 8.

Detailed Description

Reference will now be made in detail to the exemplary aspects of the present disclosure that are illustrated in the accompanying drawings. Wherever possible, the same reference numbers will be used throughout the drawings to refer to the same or like structure.

Referring now to FIG. 1, a schematic representation of a fiber optic network, generally designated 11, in a facility 13 (e.g. individual residence, apartment, condominium, business, etc.) is shown. The fiber optic network 11 includes a feeder cable 15 from a central office (not shown). The feeder cable 15 enters a feeder cable input location 17 (e.g., a fiber distribution hub, a network interface device, etc.) having one or more optical splitters (e.g., 1-to-8 splitters, 1-to-16 splitters, or 1-to-32 splitters)

that generate a number of individual fibers. In the subject embodiment, and by way of example only, the fiber distribution hub 17 is located on a lower level 19 of the facility 13. Each unit in the facility 13 includes a fiber optic enclosure, generally designated 21, with a subscriber cable 22 extending from each of the fiber optic enclosures 21 to the fiber distribution hub 17. The subscriber cable 22 extending between the fiber distribution hub 17 and the fiber optic enclosure 21 typically includes multiple optical fibers.

Referring now to FIGS. 2-5, the fiber optic enclosure 21 will now be described. The fiber optic enclosure 21 includes a housing, generally designated 23, having a cover 25.

The housing 23 includes a base 27, a first sidewall 29, and an oppositely disposed second sidewall 31. The first and second sidewalls 29, 31 extend outwardly from the base 27 such that the base 27 and the first and second sidewalls 29, 31 cooperatively define an interior region 33. In the subject embodiment, the cover 25 is hingedly engaged with a sidewall 35 that is connected to the base 27 and the first and second sidewalls 29, 31. It will be understood, however, that the scope of the present disclosure is not limited to the cover 25 being hingedly engaged the sidewall 35.

A cable spool, generally designated 37, is disposed in the interior region 33 of the fiber optic enclosure 21. The cable spool 37 includes a spooling portion 39, around which subscriber cable 22 is coiled (shown schematically in FIG. 1). The cable spool 37 further includes an axial end 41.

In the subject embodiment, the axial end 41 of the cable spool 37 defines a termination area 43 (shown as a dashed line in FIG. 5). Disposed in the termination area 43 is a termination module, generally designated 45. The termination module 45 of the fiber optic enclosure 21 serves as the dividing line between the incoming fibers and the outgoing fibers.

In the subject embodiment, the termination module 45 includes an adapter plate 47. The adapter plate 47 is an L-shaped bracket having a first side 49 (shown in FIG. 4) and a second side 51. The first side 49 defines a plurality of mounting holes 53 while the second side 51 defines an adapter slot 55. It will be

understood, however, that the scope of the present disclosure is not limited to the adapter plate 47 being an L-shaped bracket. The first side 49 of the adapter plate 47 is rigidly mounted (i.e., non-rotatable) to the axial end 41 of the cable spool 37 through a plurality of fasteners 57 (e.g., bolts, screws, rivets, etc.) which are inserted through the mounting holes 53 in the first side 49 and in connected engagement with the axial end 41 of the cable spool 37.

The adapter slot 55 in the second side 51 of the adapter plate 47 is adapted to receive a plurality of adapters, generally designated 401. In the subject embodiment, the adapters 401 are SC-type adapters 401, although it will be understood that the scope of the present disclosure is not limited to the use of SC-type adapters 401. Similar SC-type adapters 401 have been described in detail in commonly owned U.S. Pat. No. 5,317,663, the disclosure of which is incorporated herein by reference.

Referring now to FIGS. 6 and 7, the SC-type adapter 401 includes a main body 403 with a pair of tabs 405, 407 located on the exterior of the main body 403. The tabs 405, 407 serve to support the adapter 401 in the adapter slot 55. The adapter 401 further includes a pair of retaining clips 409, 411, with one retaining clip 409, 411 associated with each tab 405, 407. A front side 413 of the adapter 401 is inserted into the adapter slot 55. As the adapter 401 is inserted through the adapter slot 55, the retaining clips 409, 411 compress against the main body 403. The adapter 401 is inserted into the adapter slot 55 until the tabs 405, 407 abut the adapter plate 47. With the tabs 405, 407 abutting the adapter plate 47, the retaining clips 409, 411 decompress on the opposite side of the adapter plate 47, thereby retaining the adapter plate 47 between the retaining clips 409, 411 and the tabs 405, 407.

In an alternate embodiment, the termination module includes a plurality of sliding adapter modules. Similar sliding adapter modules have been described in detail in commonly owned U.S. Pat. Nos. 5,497,444; 5,717,810, 6,591,051 and U.S. Pat. Pub. No. 2007/0025675, the disclosures of which are incorporated herein by reference.

Referring now to FIGS 3-5, the axial end 41 of the cable spool 37 further defines a slack storage area 59. The slack storage area 59 includes a cable management spool 61 disposed on the axial end 41 of the cable spool 37. The cable management

spool 61 is sized such that an outer radius of the cable management spool 61 is larger than the minimum bend radius of the optical fibers so as to avoid attenuation damage to the optical fibers during storage.

The cable management spool 61 and the axial end 41 of the cable spool 37 cooperatively define a cable passage 63 that extends axially through the cable management spool 61 and through the axial end 41 of the cable spool 37. The cable passage 63 allows connectorized ends of incoming optical fibers to pass from the spooling portion 39 of the cable spool 37 to the slack storage area 59. The connectorized ends of the incoming optical fibers are then routed from the slack storage area 59 to the front sides 413 of the adapters 401 in the termination area 43.

Referring now to FIG. 5, the fiber optic enclosure 21 further includes a bearing mount, generally designated 71. In the subject embodiment, the bearing mount 71 is disposed on the base 27 of the housing 23. An outer surface 73 of the bearing mount 71 is adapted for a bearing 75 (shown as cross-hatching). In the subject embodiment, the bearing 75 is a needle bearing. However, it will be understood that the scope of the present disclosure is not limited to the bearing 75 being a needle bearing as the bearing 75 could also include a bushing, low-friction coating, etc.

In one embodiment, the bearing 75 is engaged with an inner diameter of a central hole of the cable spool 37. In another embodiment, a rotary plain bearing is formed between the outer surface 73 of the bearing mount 71 and the inner diameter of the central hole of the cable spool 37. In this embodiment, the outer diameter of the bearing mount 71 is sized to fit within an inner diameter of a central hole of the spooling portion 39. The engagement of the bearing mount 71 and the spooling portion 39 of the cable spool 37 allows the cable spool 37 to rotate about the central axis 77 of the bearing mount 71.

Referring now to FIGS. 1 and 5, the subscriber cable 22, which includes multiple optical fibers, is coiled around the spooling portion 39 of the cable spool 37. In order to protect the subscriber cable 22 from attenuation resulting from the coiling of the subscriber cable 22 around the spooling portion 39, the cable spool 37 has an outer circumferential surface having a radius that is greater than the minimum bend radius of

the subscriber cable 22. The subscriber cable 22 includes a first end having connectorized ends, which are inserted through the cable passage 63 and connectedly engaged with the first ends 413 of the adapters 401. A second end of the subscriber cable 22 is configured for connectivity with the fiber distribution hub 17. However, as shown in FIG. 1, the length of subscriber cable 22 needed between each of the fiber optic enclosures 21 in the facility 13 and the fiber distribution hub 17 will vary depending upon the location of each fiber optic enclosure 21 with respect to the fiber distribution hub 17.

A method of installing and using the fiber optic enclosure 21 to account for the varying lengths of subscriber cable 22 needed between the fiber optic enclosure 21 and the fiber distribution hub 17 will now be described. The fiber optic enclosure 21 provides dual functionality by serving as a storage location for the subscriber cable 22 and by selectively paying out a desired length of the subscriber cable 22.

A first length of subscriber cable 22 is stored in the fiber optic enclosure 21 by coiling the length of subscriber cable 22 around the cable spool 37. The first length of subscriber cable 22 includes an installation length, which is sufficiently long to extend from the mounting location of the enclosure 28 to the fiber distribution hub 17, and an excess length, which is the length of subscriber cable 22 remaining on the cable spool 37 after the installation length has been paid out. In one embodiment, the first length is greater than or equal to about 100 feet. In another embodiment, the first length of subscriber cable 22 is greater than or equal to about 200 feet. In another embodiment, the first length of subscriber cable 22 is greater than or equal to about 300 feet. In another embodiment, the first length of subscriber cable 22 is greater than or equal to about 400 feet. In another embodiment, the first length of subscriber cable 22 is greater than or equal to about 500 feet. In another embodiment, the first length of subscriber cable 22 is in the range of about 100 to about 2,000 feet. In another embodiment, the first length of subscriber cable 22 is in the range of about 100 to about 1,500 feet. In another embodiment, the first length of subscriber cable 22 is in the range of about 500 to about 1,500 feet. In a preferred embodiment, the first length of

subscriber cable 22, which is coiled around the cable spool 89, is in the range of 100 to 500 feet.

In one embodiment, a second length, or the excess length, of subscriber cable 22 is stored around the cable spool 37 after the first length of subscriber cable 22 has been paid out. If the first length of subscriber cable 22 is greater than the installation length of subscriber cable 22, the second length, or excess length, is stored around the cable spool 37.

The second function of the fiber optic enclosure 21 involves the selective payout of the subscriber cable 22. With the cable spool 37 mounted to the bearing mount 71, the first end of the subscriber cable 22 in connected engagement with the front sides 413 of the adapters 401 and the outgoing optical fibers disengaged from the back sides of the adapters 401, the subscriber cable 22 can be paid out through fiber ports 79 disposed in the first and second sidewalls 29, 31. The subscriber cable 22 is paid out of the fiber optic enclosure 21 by selectively rotating the cable spool 37 with respect to the housing 23 about the central axis 77 of the bearing mount 71. As the termination module 45 is disposed on the axial end 41of the cable spool 37, the selective rotation of the cable spool 37 with respect to the housing 23 results in the selective rotation of the termination module 45. Since the termination module 45 rotates unitarily with or in unison with the cable spool 37, the second end of the subscriber cable 22 can be paid out without the first end of the subscriber cable 22 being pulled out of the termination module 45.

Once the desired length of subscriber cable 22 has been paid out, the rotation of the cable spool 37 is ceased. At this point, the position of the cable spool 37 can be fixed such that it does not rotate relative to the housing 23. In one embodiment, a pin is inserted through an opening in the axial end 41 of the cable spool 37 and through a corresponding opening in the base 27 of the housing 23 to fix the position of the cable spool 37 with respect to the housing 23. It will be understood, however, that the scope of the present disclosure is not limited to the use of a pin to fix the position of the cable spool 37 with respect to housing 23.

An alternate method of selectively paying-out subscriber cable 22 from the fiber optic enclosure 21 will now be described. With the fiber optic enclosure 21 positioned near the fiber distribution hub 17, the second end of the subscriber cable 22 is unwound from the cable spool 37. In one embodiment, the second end is optically connected to the fiber distribution hub 17. With the second end of the subscriber cable 22 optically connected to the fiber distribution hub 17 and the first end of the subscriber cable 22 in connected engagement with the termination module 45, the fiber optic enclosure 21 is transported away from the fiber distribution hub 17. In one embodiment, the fiber optic enclosure 21 is carried away from the fiber distribution hub 17 by an installer. In another embodiment, the fiber optic enclosure 21 is transported away from the fiber distribution hub 17 in a wheeled cart (e.g., dolly, 4-wheeled cart, etc.). In a preferred embodiment, the fiber optic enclosure is disposed in a packaging enclosure (e.g., a box) during transport. As the fiber optic enclosure 21 is transported away from the fiber distribution hub 17, the subscriber cable 22 unwinds from the cable spool 37 causing the cable spool 37 to rotate within the interior region 33 of the housing 23, which is disposed in the packaging enclosure. When the fiber optic enclosure 21 has been transported to its mounting location, the fiber optic enclosure 21 is removed from the packaging enclosure, mounted to the mounting location. The cable spool 37 can be fixed in position relative to the housing 23 to prevent inadvertent rotation of the cable spool 37.

Referring now to FIGS. 8-18, an alternate embodiment of a fiber optic enclosure 121 is shown. The fiber optic enclosure 121 includes a housing 123 and a hinged cover 125.

The housing 123 includes a base wall 120, a first sidewall 127 and an oppositely disposed second sidewall 128. The first and second sidewalls 127, 128 extend outwardly from the base wall 120 such that the base wall 120 and the first and second sidewalls 127, 128 cooperatively define an interior region 130.

In the subject embodiment, the first sidewall 127 of the housing 123 defines a first port 131 while the second sidewall 128 defines a second port 132. The subscriber cable 122 enters/exits the fiber optic enclosure 121 at the first port 131 or at

the second port 132. In the subject embodiment, both of the first and second ports 131, 132 are provided as knockout portions.

A cable spool 137 is positioned within the interior region 130 of enclosure 121. In the subject embodiment, the cable spool 137 is adapted for rotation within the interior region 130 of the enclosure 121. In the subject embodiment, the cable spool 137 includes a first axial end 136, an oppositely disposed second axial end 138 and a spool portion 139. The spool portion 139 is disposed between the first and second axial ends 136, 138 of the cable spool 137. The spool portion 139 is adapted to receive a subscriber cable 122 coiled around or spooled on the spool portion 139.

With the subscriber cable 122 spooled on the spool portion 139, the subscriber cable 122 can be selectively paid out by rotating the cable spool 137. As the cable spool 137 is rotated, the subscriber cable 122 is unwound from the spool portion 139 of the cable spool 137. After a desired length of subscriber cable 122 has been paid out, pin openings 141 can be used with a pin to fix the position of cable spool 137 relative to housing 123.

The subscriber cable 122 is shown with a connectorized end 144 (e.g., MTP connector) for connecting to the fiber distribution hub 17 or other equipment. An opposite end of the subscriber cable 122 passes through an opening 145 disposed in the first axial end 136 of the cable spool 137. After passing through the opening 145, the subscriber cable 122 is routed to a fanout 147 disposed on the first axial end 136 of the cable spool 137 where the cable is broken out into individual fibers 124 having connectorized ends 146 (e.g., SC connectors).

A cable management spool 161 is also disposed on the first axial end 136 of the cable spool 137. The cable management spool 161 manages fibers 124. In the subject embodiment, the cable management spool 161 includes a plurality of fingers 162 disposed on an end of the cable management spool 161. The fingers 162 assist with cable retention.

The first axial end 136 of the cable spool 137 further includes an outer guide wall 163. In the subject embodiment, the outer guide wall 163 is disposed at a portion of the peripheral edge of the first axial end 136 adjacent to the cable

management spool 161. In the subject embodiment, the outer guide wall 163 extends outwardly in a direction that is generally perpendicular to the first axial end 136.

The outer guide wall 163 includes with a cable finger 164 disposed at an end of the outer guide wall 163 that is opposite the end engaged with the first axial end 136 of the cable spool 137. The cable finger 164 assists with retention and protection of the fibers 124.

An adapter plate 149 is disposed on the first axial end 136 of the cable spool 137. In the subject embodiment, the adapter plate 149 includes separate openings 151. Each of the separate openings 151 is adapted to receive two adapters 401.

In the depicted embodiment of FIG. 16, the cable management spool 161, the outer guide wall 163 and the adapter plate 149 are integrally formed with the first axial end 136 of the cable spool 137. In the subject embodiment, the first axial end 136 of the cable spool 137 is formed from plastic. In another embodiment, the first and second axial ends 136, 138, the spool portion 139, the adapter plate 149, the cable management spool 161 and the outer guide wall 163 are integrally formed from a plastic material.

Referring now to FIGS. 13 and 14, the fiber optic enclosure 121 is shown connected to a second subscriber cable 126. After the subscriber cable 122 is paid out and cable spool 137 fixed in position relative to the housing 123, individual connectorized ends of the second subscriber cables 126 can be connected to the fibers 124 at adapters 401 of adapter plate 149. The second subscriber cables 126 exit the fiber optic enclosure 121 at a port 136 in a side 165 of the housing 123. In the illustrated embodiment, a slotted foam member 138 is disposed in the port 136. The slotted foam member 138 includes a plurality of slots through which the second subscriber cables 126 can be inserted in order to prevent or reduce the risk of ingress of environmental contamination (e.g., dust, water, etc.).

While the fiber optic enclosure 121 is shown mounted to a mounting location 183 (e.g., wall, pole, etc.) in FIGS. 1 and 17, it will be understood that the subscriber cable 122 can be paid out from the fiber optic enclosure 121 while the fiber optic enclosure 121 is either mounted to a mounting location 183 or removed from the

mounting location 183. As shown in FIG. 18, the subscriber cable 122 could be paid out while the fiber optic enclosure 121 is still packaged in a shipping container 179 provided there is an opening 181 in the shipping container 179 through which the subscriber cable 122 can be pulled. After the subscriber cable 122 has been paid out, the fiber optic enclosure 121 can be removed from the shipping container 179 and mounted to the mounting location 183.

Various modifications and alterations of this disclosure will become apparent to those skilled in the art without departing from the scope and spirit of this disclosure, and it should be understood that the inventive scope of this disclosure is not to be unduly limited to the illustrative embodiments set forth herein.

WHAT IS CLAIMED IS:

1. A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing having an interior region;

a bearing mount disposed in the interior region of the housing;

a cable spool engaged with the bearing mount such that the cable spool selectively rotates within the housing; and

a termination module disposed on the cable spool so that the termination module rotates in unison with the cable spool.

2. A fiber optic enclosure assembly as claimed in claim 1, wherein a needle bearing is disposed on an outer surface of the bearing mount.

3. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module includes an adapter plate having an adapter slot with a plurality of adapters engaged with the adapter slot.

4. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module includes a plurality of sliding adapter modules.

5. A fiber optic enclosure assembly as claimed in claim 1, wherein an axial end of the cable spool defines a cable passage.

6. A fiber optic enclosure assembly as claimed in claim 1, wherein an axial end of the cable spool defines a slack storage area.

7. A fiber optic enclosure assembly as claimed in claim 6, wherein the slack storage area includes a cable management spool.

8. A method of paying out a fiber optic cable from a fiber optic enclosure, comprising:

rotating a cable spool, which includes a fiber optic cable coiled around a spooling portion of the cable spool, about an axis of a housing of a fiber optic enclosure until a desired length of fiber optic cable is paid out, the cable spool being disposed in an interior region of the housing and having a termination module disposed on the cable spool.

9. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the termination module is disposed on an axial end of the cable spool.

10. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the termination module includes a plurality of adapters.

11. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 10, wherein the termination module includes an adapter plate having an adapter slot with the plurality of adapters engaged with the adapter slot.

12. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 10, where the termination module includes a plurality of sliding adapter modules.

13. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein connectorized ends of a first end of the fiber optic cable are connected to adapters disposed in the termination module.

14. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the housing is mounted to a wall.

15. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the fiber optic enclosure is packaged in a shipping container during pay out of the fiber optic cable.

16. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, further comprising fixing the position of the cable spool with respect to the housing when the desired length of fiber optic cable has been paid out.

17. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 16, wherein a pin fixes the position of the cable spool with respect to the housing.

Abstract

A fiber optic enclosure assembly includes a housing having an interior region and a bearing mount disposed in the interior region of the housing. A cable spool is connectedly engaged with the bearing mount such that the cable spool selectively rotates within the housing. A termination module disposed on the cable spool so that the termination module rotates in unison with the cable spool. A method of paying out a fiber optic cable from a fiber optic enclosure includes rotating a cable spool, which has a subscriber cable coiled around a spooling portion of the cable spool, about an axis of a housing of the fiber optic enclosure until a desired length of subscriber cable is paid out. A termination module is disposed on the cable spool.

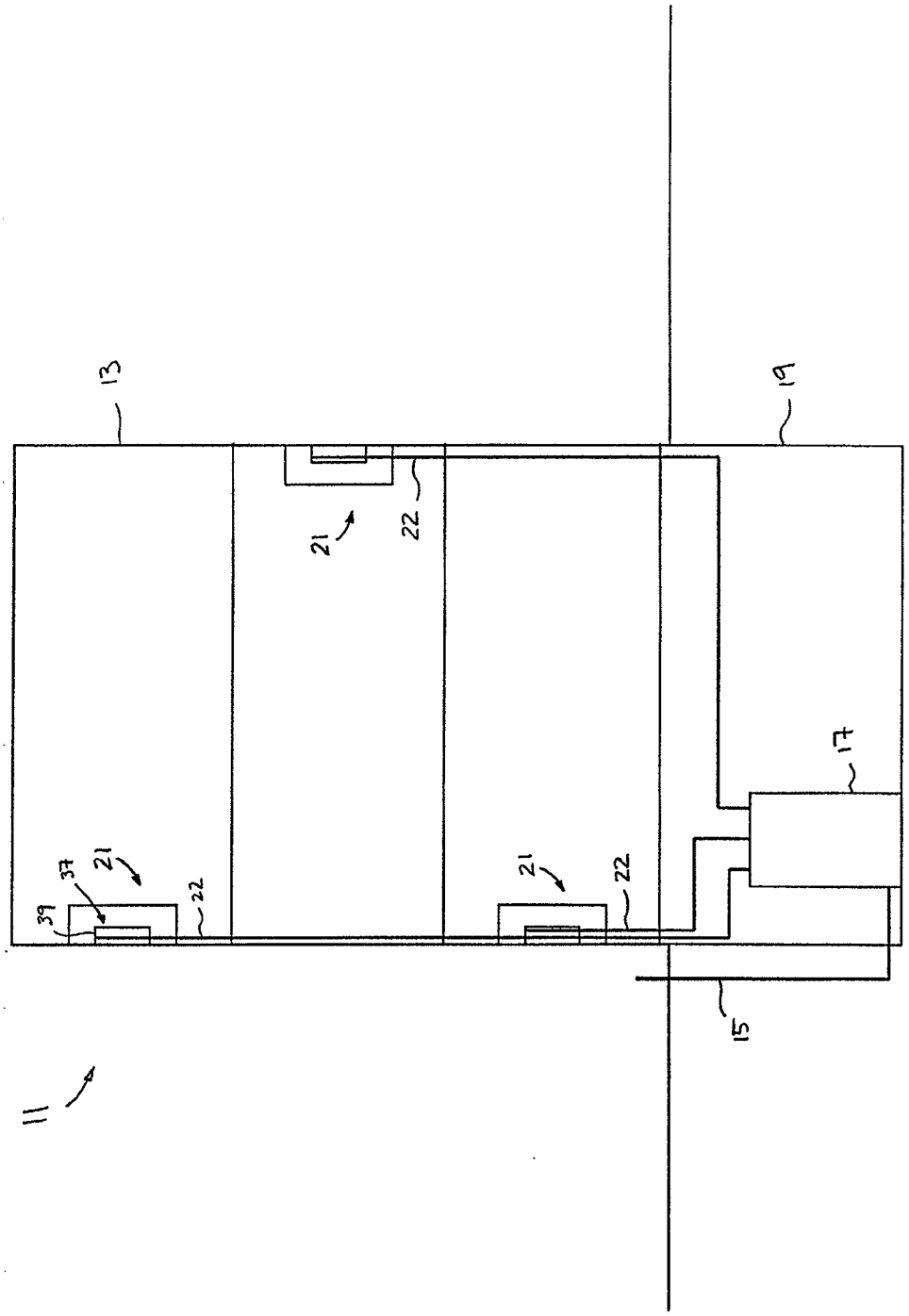


FIG. 1

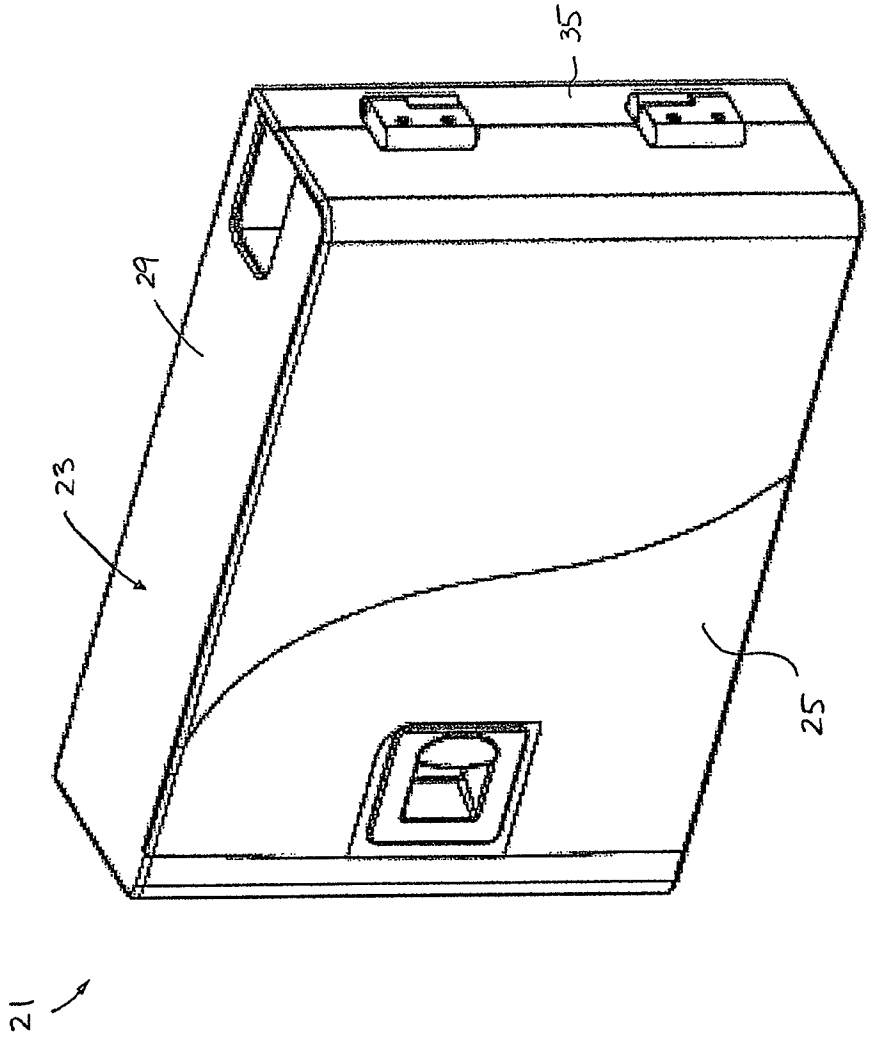


FIG. 2

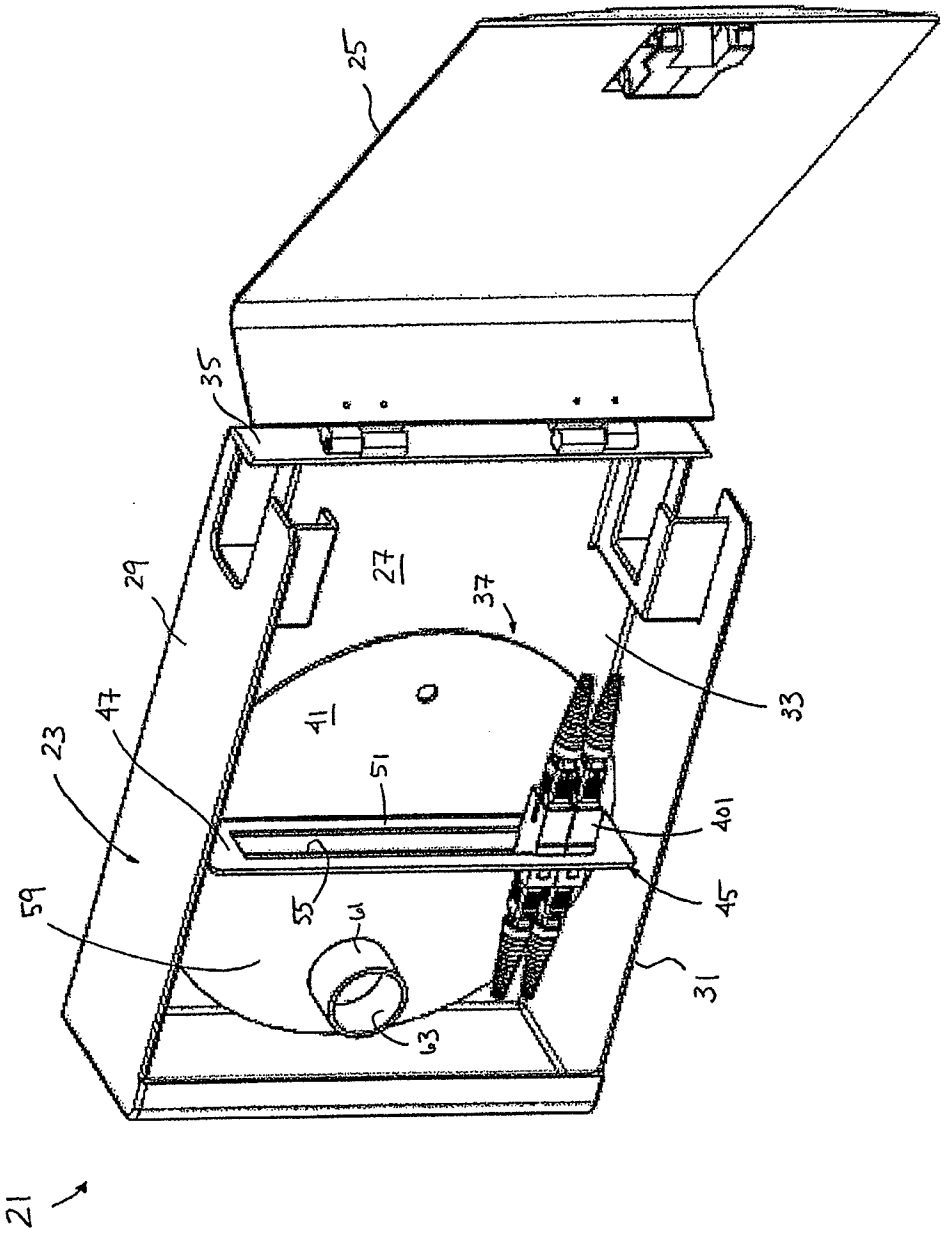


FIG. 3

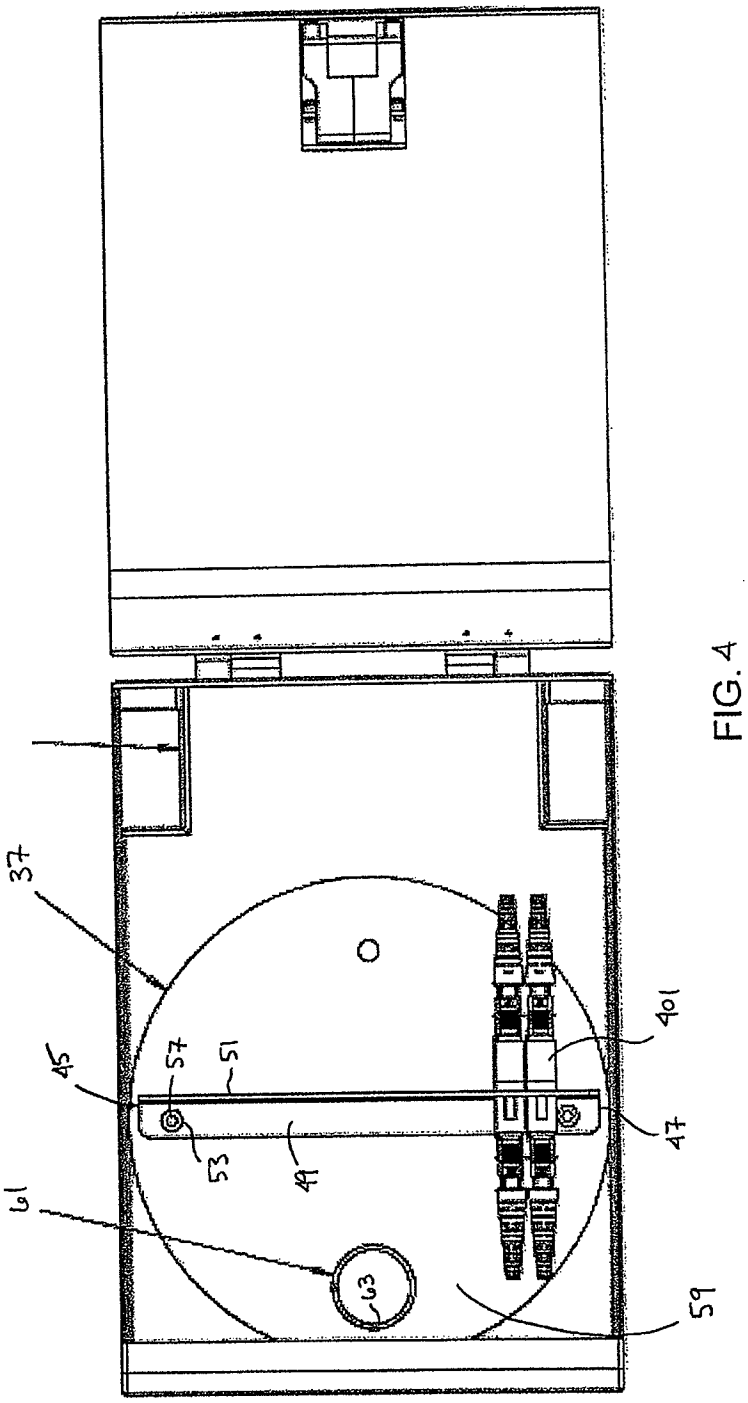


FIG. 4

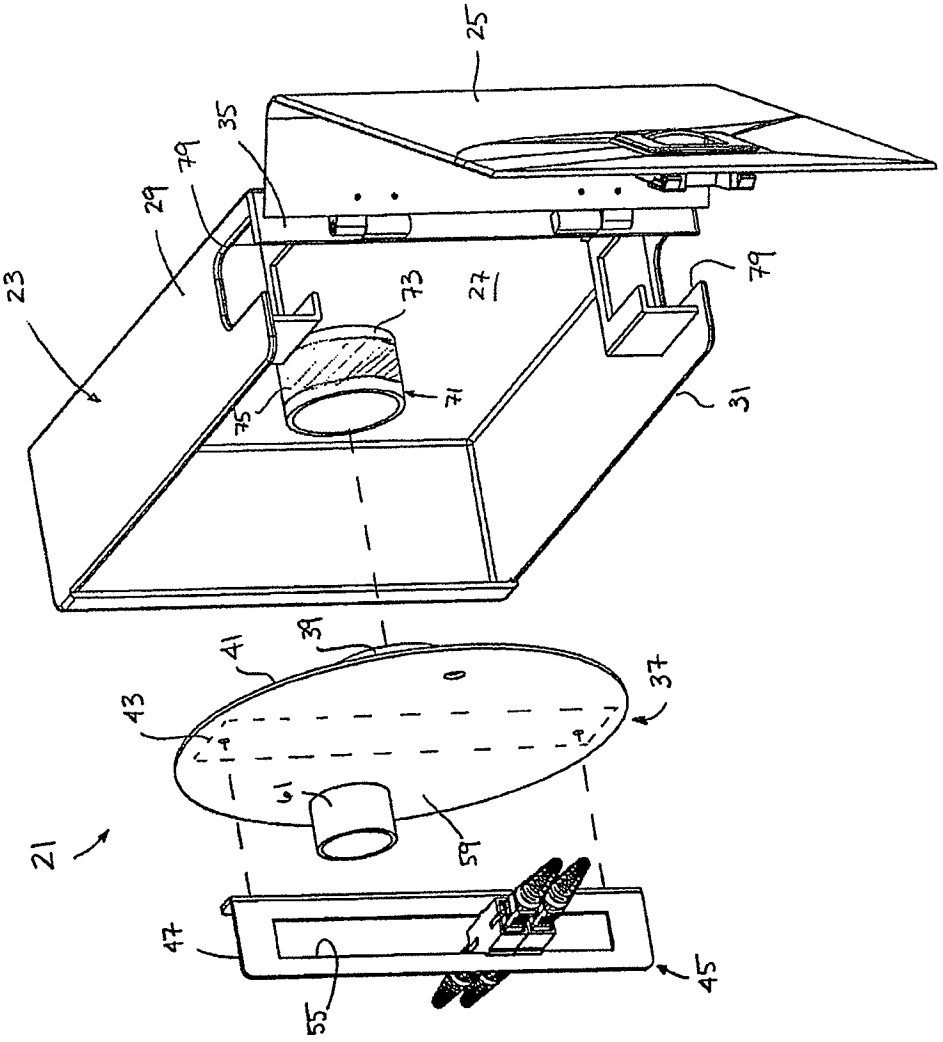


FIG. 5

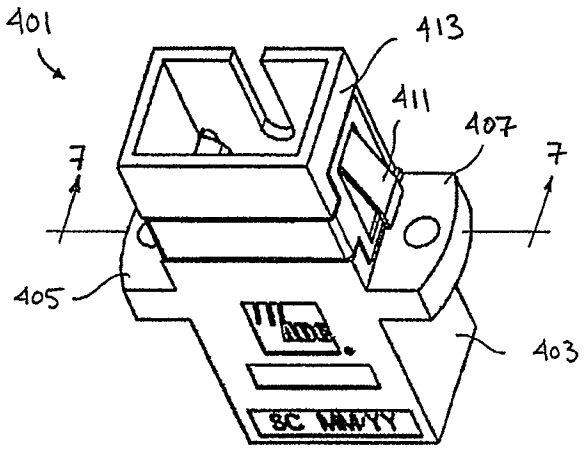


FIG. 6

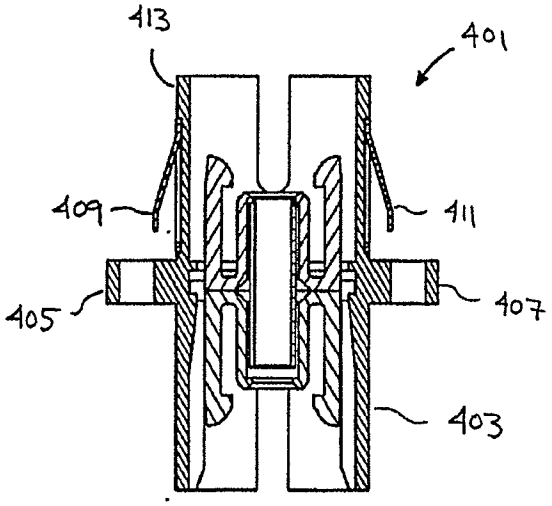


FIG. 7

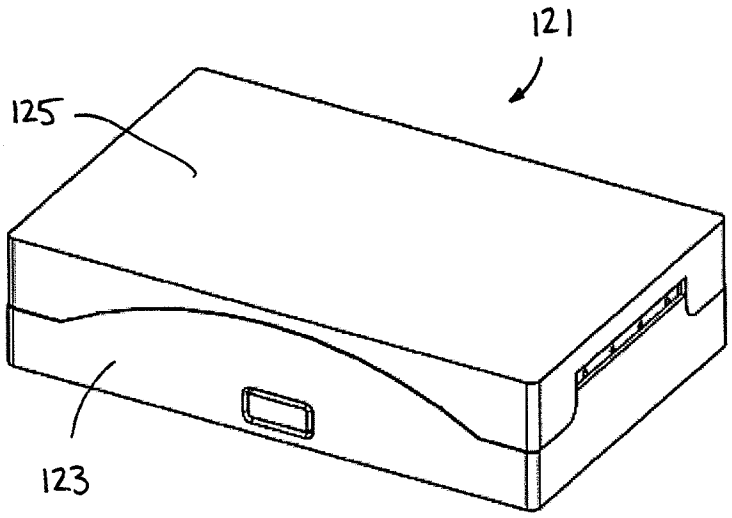


FIG. 8

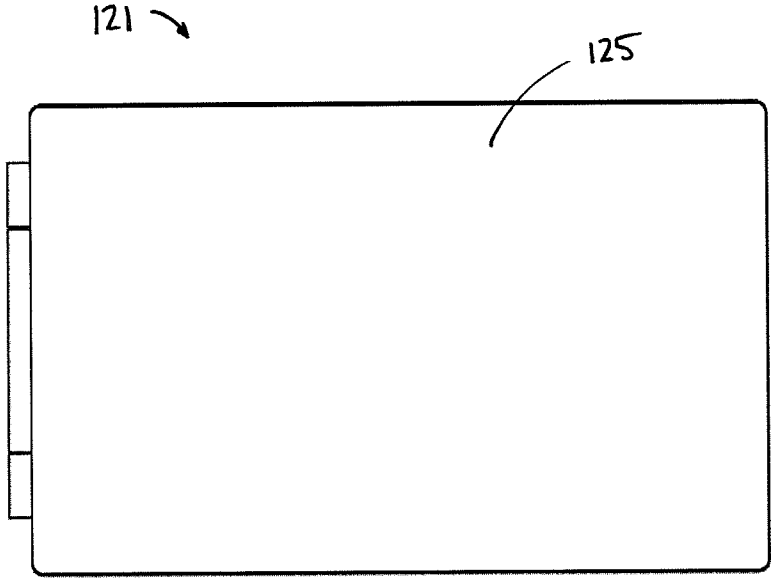


FIG. 9

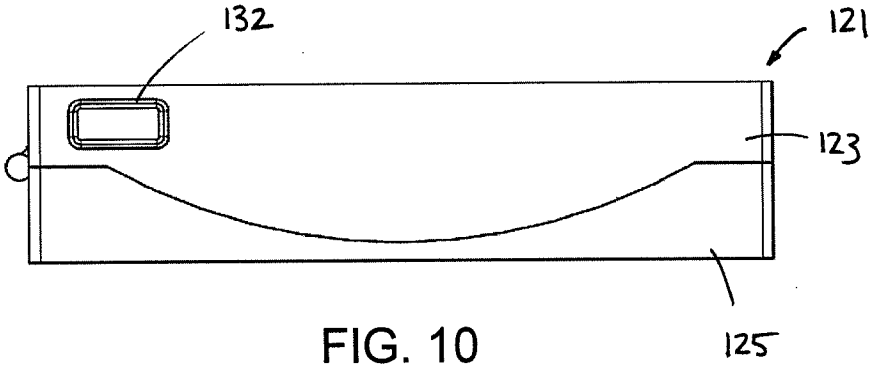


FIG. 10

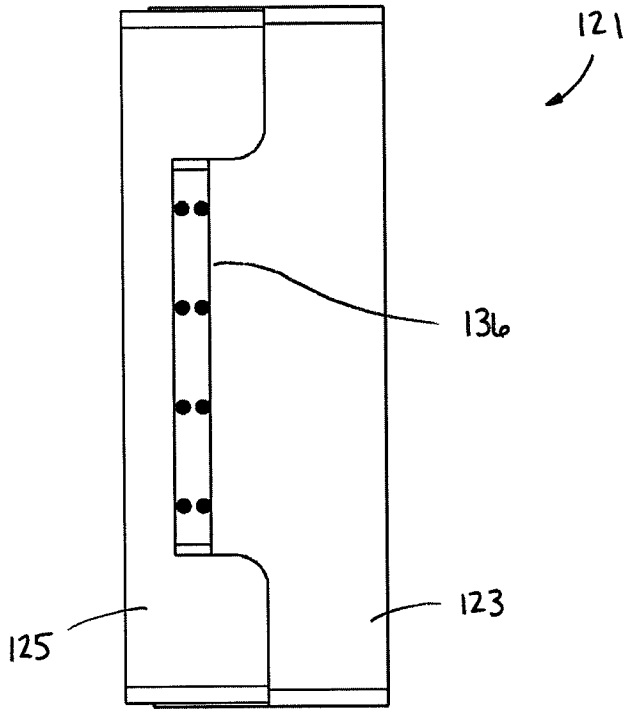


FIG. 11

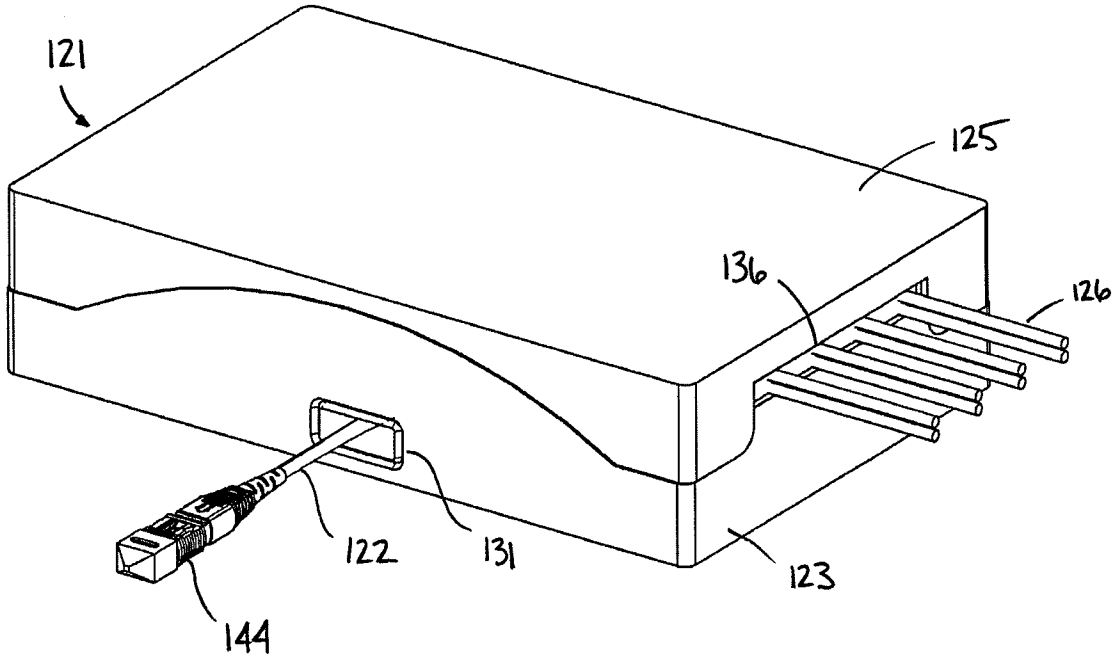


FIG. 12

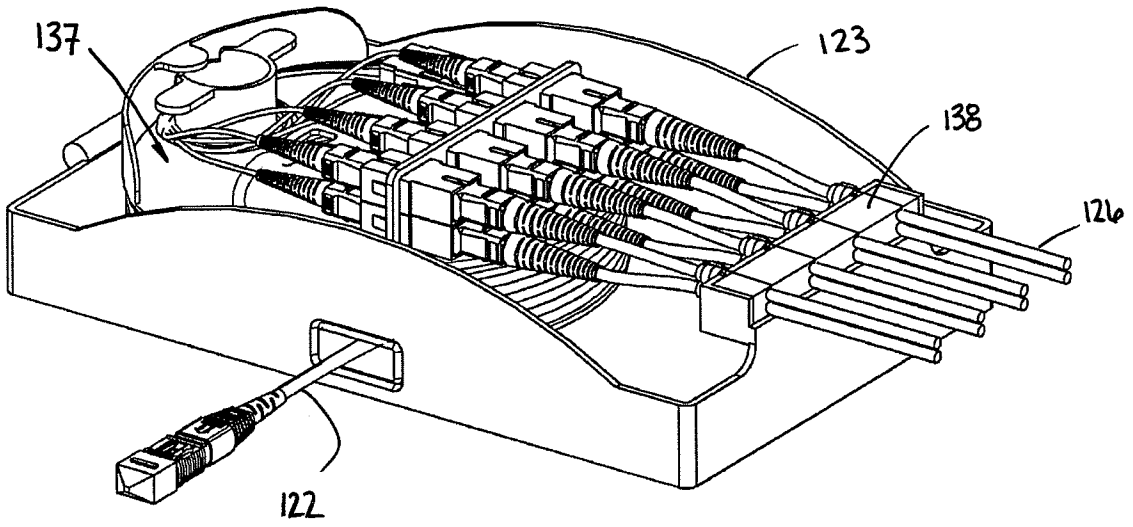


FIG. 13

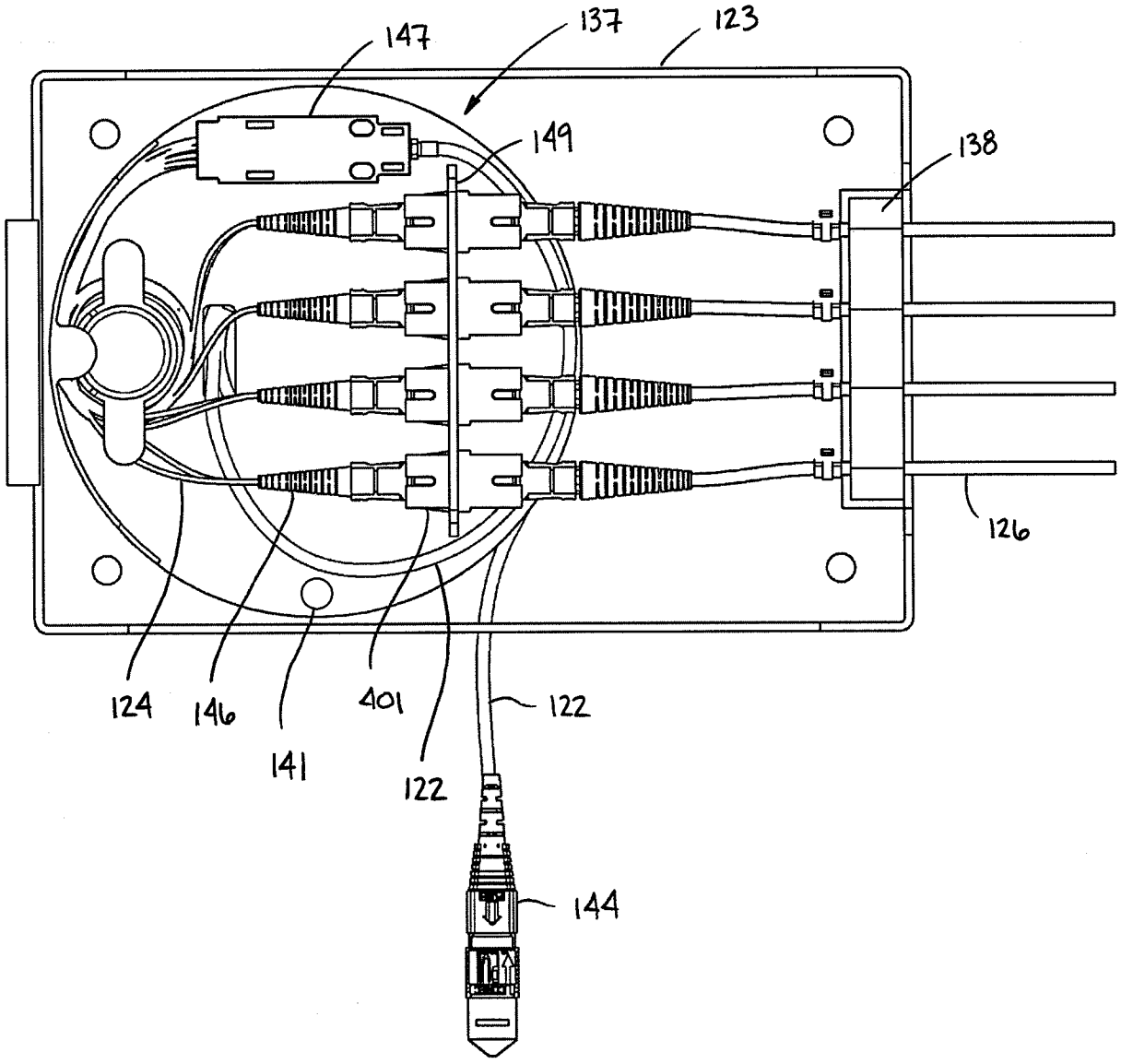


FIG. 14

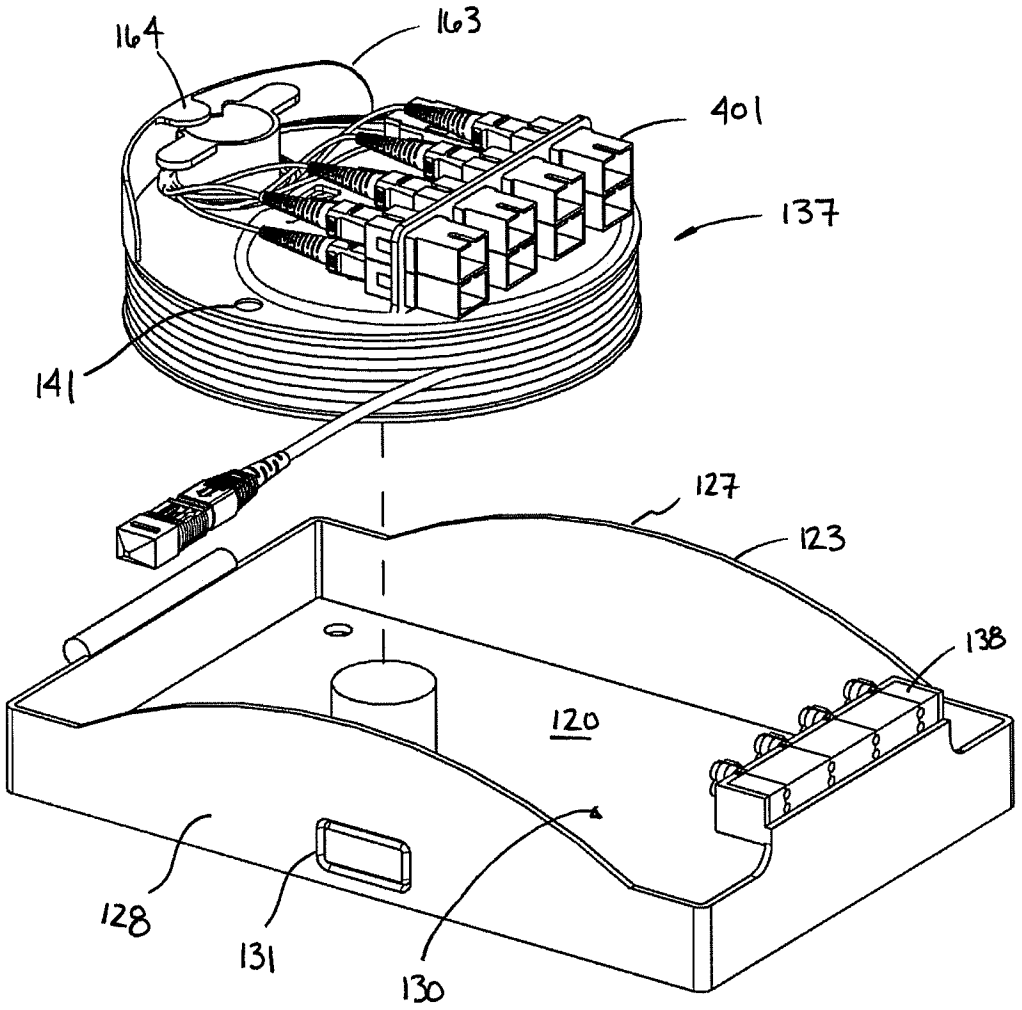


FIG. 15

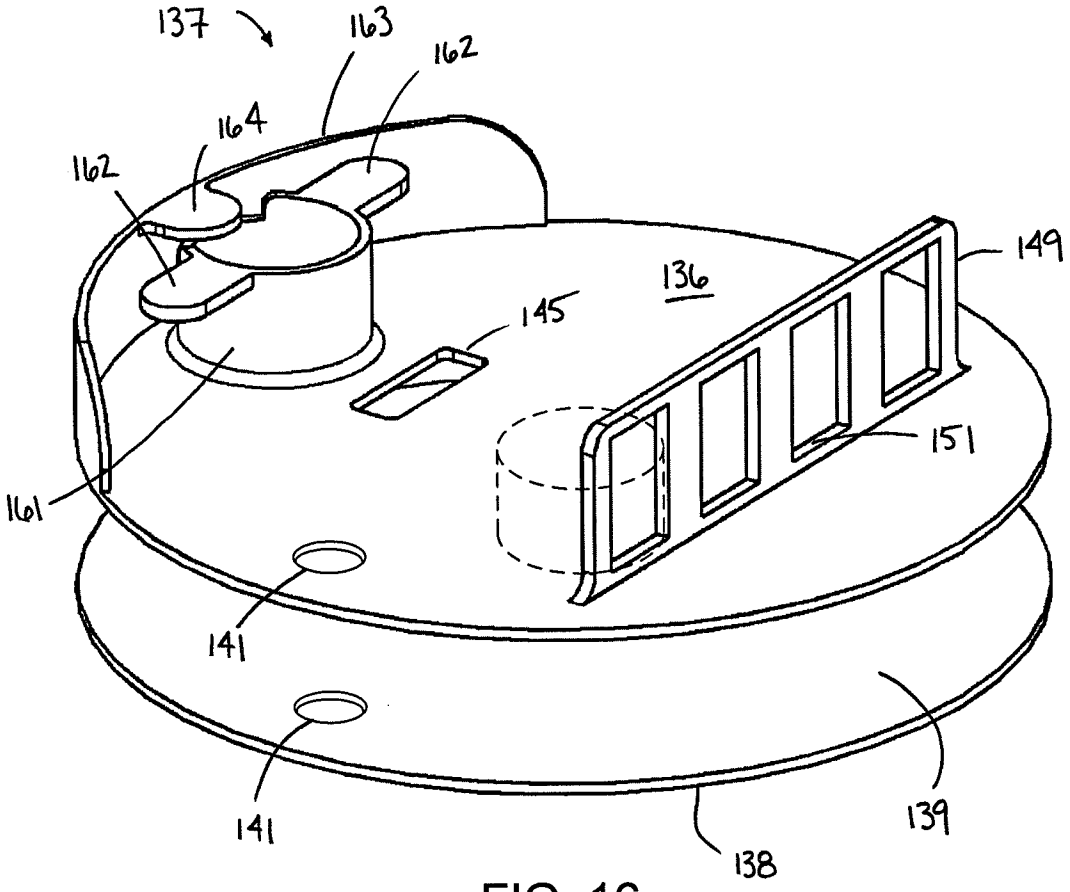


FIG. 16

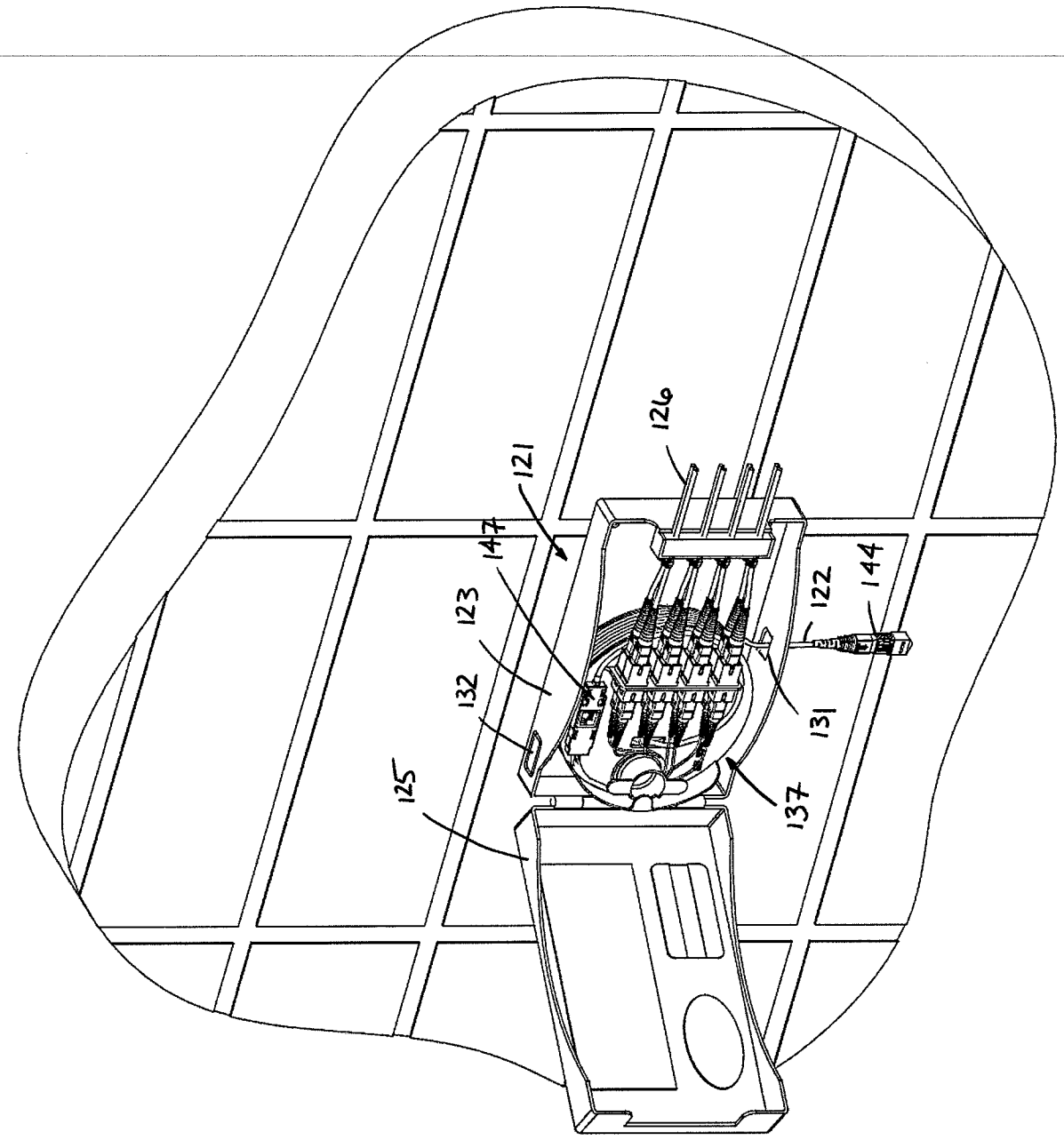


FIG. 17

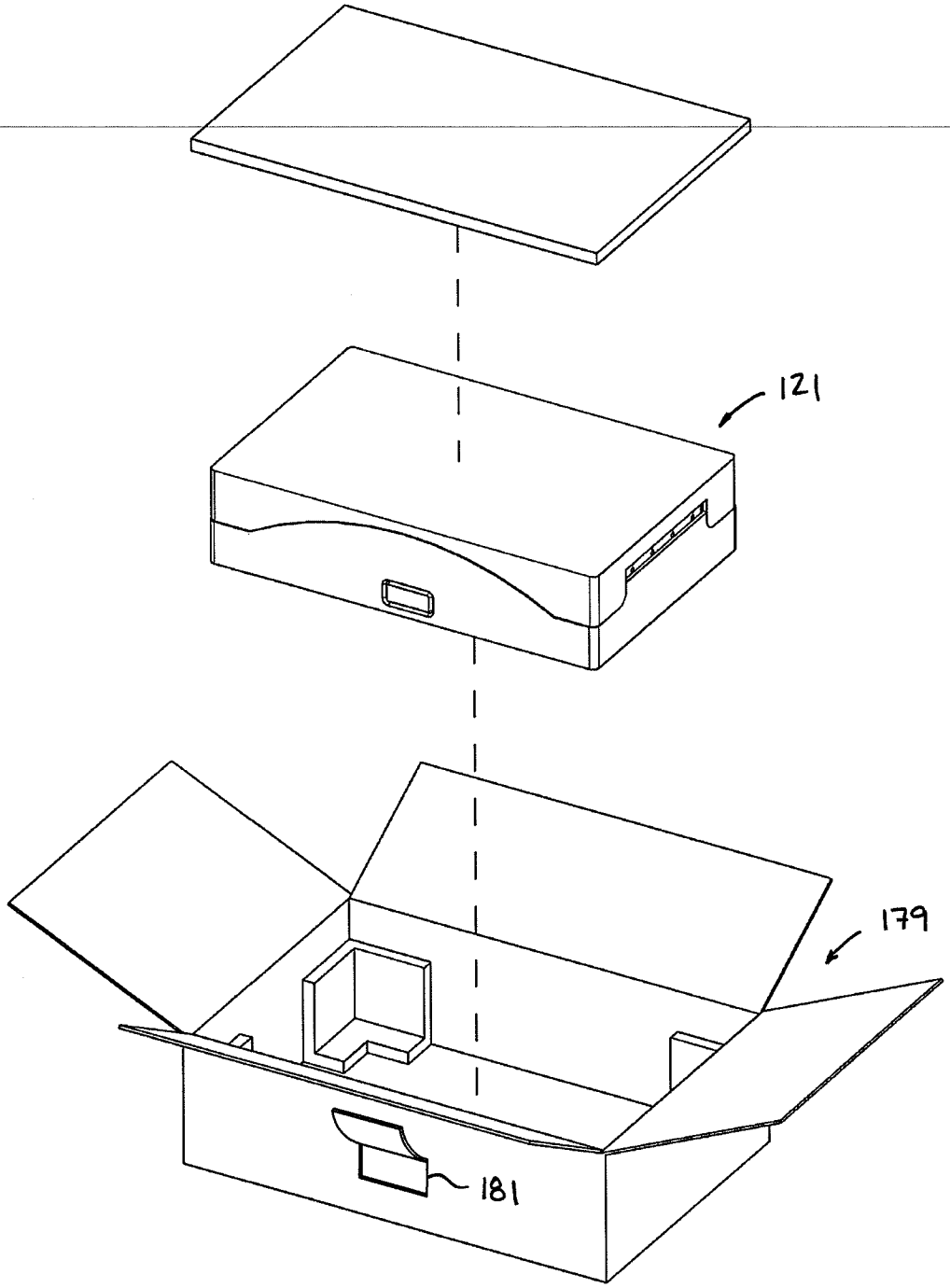


FIG. 18

Attorney Docket No. 02316.2584USU2

MERCHANT & GOULD P.C.

United States Patent Application

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor I hereby declare that: my residence, post office address and citizenship are as stated below next to my name; that

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

The specification of which
a. ☒ is attached hereto
b. ☐ was filed on as application serial no. and was amended on (if applicable) (in the case of a PCT-filed application) described and claimed in international no. filed and as amended on (if any), which I have reviewed and for which I solicit a United States patent.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on the basis of which priority is claimed:

a. ☐ no such applications have been filed.
b. ☒ such applications have been filed as follows:

FOREIGN APPLICATION(S), IF ANY, CLAIMING PRIORITY UNDER 35 USC § 119			
COUNTRY	**APPLICATION NUMBER**	**DATE OF FILING (day, month, year)**	**DATE OF ISSUE (day, month, year)**
ALL FOREIGN APPLICATION(S), IF ANY, FILED BEFORE THE PRIORITY APPLICATION(S)			
COUNTRY	**APPLICATION NUMBER**	**DATE OF FILING (day, month, year)**	**DATE OF ISSUE (day, month, year)**

I hereby claim the benefit under Title 35, United States Code, § 120/365 of any United States and PCT international application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. APPLICATION NUMBER	DATE OF FILING (day, month, year)	STATUS (patented, pending, abandoned)

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below:

U.S. PROVISIONAL APPLICATION NUMBER	DATE OF FILING (Day, Month, Year)
60/954,214	06 August 2007
61/029,248	15 February 2008

I acknowledge the duty to disclose information that is material to patentability of this application in accordance with Title 37, Code of Federal Regulations, § 1.56 (reprinted below):

§ 1.56 Duty to disclose information material to patentability.

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

(1) prior art cited in search reports of a foreign patent office in a counterpart application, and

(2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

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

(1) It establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim;

or

(2) It refutes, or is inconsistent with, a position the applicant takes in:

(i) Opposing an argument of unpatentability relied on by the Office, or

(ii) Asserting an argument of patentability.

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

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

(1) Each inventor named in the application:

(2) Each attorney or agent who prepares or prosecutes the application; and

(3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

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

(e) In any continuation-in-part application, the duty under this section includes the duty to disclose to the Office all information known to the person to be material to patentability, as defined in paragraph (b) of this section, which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby appoint the attorney(s) and/or patent agent(s) associated with the following customer number to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith.

23552
PATENT TRADEMARK OFFICE

I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/ organization who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct Merchant & Gould P.C. to the contrary.

I understand that the execution of this document, and the grant of a power of attorney, does not in itself establish an attorney-client relationship between the undersigned and the law firm Merchant & Gould P.C., or any of its attorneys.

Please direct all correspondence in this case to customer number 23552.

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

2	**Full Name Of Inventor**	**Family Name** Kowalczyk	**First Given Name** Scott	**Second Given Name** C.
0	**Residence & Citizenship**	**City** Savage	**State or Foreign Country** Minneasota	**Country of Citizenship** USA
1	**Mailing Address**	**Address** 7628 Southrdige Court	**City** Savage	**State & Zip Code/Country** Minneasota 55378/USA
Signature of Inventor 201:				**Date:**
2	**Full Name Of Inventor**	**Family Name** Coan	**First Given Name** Jonathan	**Second Given Name** Walter
0	**Residence & Citizenship**	**City** Savage	**State or Foreign Country** Minnesota	**Country of Citizenship** USA
2	**Mailing Address**	**Address** 4441 W. 134 St.	**City** Savage	**State & Zip Code/Country** Minnesota 55378/USA
Signature of Inventor 202:				**Date:**
2	**Full Name Of Inventor**	**Family Name** Kaml	**First Given Name** Jonathan	**Second Given Name**
0	**Residence & Citizenship**	**City** Shakopee	**State or Foreign Country** Minnesota	**Country of Citizenship** USA
3	**Mailing Address**	**Address** 560 Gorman St., Apt. 312	**City** Shakopee	**State & Zip Code/Country** Minnesota 55379/USA
Signature of Inventor 203:				**Date:**

Application Data Sheet

Application Information

Application Type::	Regular
Subject Matter::	Utility
Suggested Classification::	
Suggested Group Art Unit::	
CD-ROM or CD_R?::	None
Number of CD disks::	
Number of copies of CDs::	
Sequence Submission::	No
Computer Readable Form (CRF)?::	No
Title::	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
Attorney Docket Number::	02316.2584USU2
Request For Early Publication::	No
Request For Non-Publication::	No
Suggested Drawing Figure::	
Total Drawing Sheets::	14
Small Entity::	No
Latin Name::	
Variety Denomination Name::	
Petition Included::	No
Petition Type::	
Licensed US Govt. Agency::	
Contract or Grant Numbers::	
Secrecy Order in Parent Appl.?::	No

Applicant Information

Applicant Authority Type::	Inventor
Primary Citizenship Country::	USA
Status::	Full Capacity
Given Name::	Scott
Middle Name::	C.
Family Name::	Kowalczyk
Name Suffix::	
City of Residence::	Savage
State or Province of Residence::	Minnesota
Country of Residence::	USA
Street of mailing address::	7628 Southridge Court
City of mailing address::	Savage
State or Province of mailing address::	Minnesota
Country of mailing address::	USA
Postal or Zip Code of mailing address::	55378

Applicant Information

Applicant Authority Type::	Inventor
Primary Citizenship Country::	USA
Status::	Full Capacity
Given Name::	Jonathan
Middle Name::	Walter
Family Name::	Coan
Name Suffix::	
City of Residence::	Savage
State or Province of Residence::	Minnesota
Country of Residence::	USA
Street of mailing address::	4441 W. 134 St.

Initial 07/30/08

City of mailing address::	Savage
State or Province of mailing address::	Minnesota
Country of mailing address::	USA
Postal or Zip Code of mailing address::	55378

Applicant Information

Applicant Authority Type::	Inventor
Primary Citizenship Country::	USA
Status::	Full Capacity
Given Name::	Jonathan
Middle Name::	
Family Name::	Kaml
Name Suffix::	
City of Residence::	Shakopee
State or Province of Residence::	Minnesota
Country of Residence::	USA
Street of mailing address::	560 Gorman St., Apt. 312
City of mailing address::	Shakopee
State or Province of mailing address::	Minnesota
Country of mailing address::	USA
Postal or Zip Code of mailing address::	55379

Correspondence Information

Correspondence Customer Number::	23552

Initial 07/30/08

Representative Information

Representative Customer Number::	23552

Domestic Priority Information

Application::	Continuation Type::	Parent Application::	Parent Filing Date::
This application	Application claiming the benefit under 35 USC 119(e)	60/594,214	08/06/07
This application	Application claiming the benefit under 35 U.S.C. 119(e)	61/029,248	02/15/08

Assignee Information

Assignee Name::	ADC Telecommunications, Inc.
Street of mailing address::	13625 Technology Drive
City of mailing address::	Eden Prairie
State or Province of mailing address::	Minnesota
Country of mailing address::	USA
Postal or Zip Code of mailing address::	55344-2252

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
Filer:	Jarett Dykes Millar/Jessica Molitor
Attorney Docket Number:	02316.2584USU2

Filed as Large Entity

Utility Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility application filing	1011	1	310	310
Utility Search Fee	1111	1	510	510
Utility Examination Fee	1311	1	210	210
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1030**

Electronic Acknowledgement Receipt

EFS ID:	3703544
Application Number:	12182705
International Application Number:	
Confirmation Number:	4252
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
Customer Number:	23552
Filer:	Jarett Dykes Millar/Jessica Molitor
Filer Authorized By:	Jarett Dykes Millar
Attorney Docket Number:	02316.2584USU2
Receipt Date:	30-JUL-2008
Filing Date:	
Time Stamp:	16:47:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1030
RAM confirmation Number	2183
Deposit Account	132725
Authorized User	MILLAR,JARETT D.

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

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (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	Transmittal of New Application	Transmittal.PDF	107220 42fa60bc36fa01d31b84c9a4a0d271a1d05dee51	no	1
Warnings:					
Information:					
2		Application.PDF	667237 d65111c9c9bcc5fe16afae08b252213a358e3291	yes	16

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	12
Claims	13	15
Abstract	16	16

Warnings:					
Information:					
3	Drawings-only black and white line drawings	Drawings.PDF	462110 65fd8b661a6fba03d6b23d7e936afe6db9fd2fb7	no	14
Warnings:					
Information:					
4	Oath or Declaration filed	Combined_Dec_and_POA.PDF	99052 08c9100b7fe02df2994f48142f62409d0c443ff7	no	4
Warnings:					
Information:					
5	Application Data Sheet	Application_Data_Sheet.PDF	126304 fa138c9005b7e3097f739e34674f4fa1c5a2cf8c	no	4
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
6	Fee Worksheet (PTO-06)	fee-info.pdf	8381 8bfe16d876cc200f29f0bb1e078c83ac4d8c8318	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1470324		

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.

Filing Date: 7/30/2008

Approved for use through 7/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 12/182,705

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	310
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	510
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	210
TOTAL CLAIMS (37 CFR 1.16(i))	17 minus 20 =	0	X$ 25		OR	X$50	0
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	* 0	X$105			X$210	0
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $260 ($130 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))			185			370	
			TOTAL	0		TOTAL	1030

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II

AMENDMENT A	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X =		OR	X =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X =		OR	X =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
					TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

AMENDMENT B	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X =		OR	X =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X =		OR	X =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
					TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

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

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

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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