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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
61/029,248	02/15/2008		260	2316.2584USP5		

CONFIRMATION NO. 4574

UPDATED FILING RECEIPT

23552
MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

OC000000032992435

Date Mailed: 11/07/2008

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

Applicant(s)

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

Power of Attorney:
David Schmaltz--39828

If Required, Foreign Filing License Granted: 03/04/2008
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 61/029,248**
Projected Publication Date: None, application is not eligible for pre-grant publication
Non-Publication Request: No
Early Publication Request: No
Title

FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

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.

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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).

PTO/SB/16 (04-07)
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Provisional Application for Patent Cover Sheet

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c)

Inventor(s)

Inventor 1 — Remove

Given Name	Middle Name	Family Name	City	State	Country
Scott	C.	Kowalczyk	Savage	MN	US

Inventor 2 — Remove

Given Name	Middle Name	Family Name	City	State	Country
Jonathan	Walter	Coan	Savage	MN	US

Inventor 3 — Remove

Given Name	Middle Name	Family Name	City	State	Country
Jonathan	R.	Kaml	Shakopee	MN	US

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

Title of Invention	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
Attorney Docket Number (if applicable)	2316.2584USP5

Correspondence Address

Direct all correspondence to (select one):

◉ The address corresponding to Customer Number	○ Firm or Individual Name
Customer Number	23552

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

◉ No.

○ Yes, the name of the U.S. Government agency and the Government contract number are:

PTO/SB/16 (04-07)
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Entity Status

Applicant claims small entity status under 37 CFR 1.27

◯ Yes, applicant qualifies for small entity status under 37 CFR 1.27

◉ No

Warning

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Signature

Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/David G. Schmaltz/			Date (YYYY-MM-DD)	May 5, 2008
First Name	David	Last Name	Schmaltz	Registration Number (If appropriate)	39828

This collection of information is required by 37 CFR 1.51. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 8 hours 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. **This form can only be used when in conjunction with EFS-Web. If this form is mailed to the USPTO, it may cause delays in handling the provisional application.**

IPR2025-01119
Belden EX1008

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or paten. Accordingly, pursuant to the requirements of the Act, please be advised that : (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, t o a n other federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	61029248
Filing Date:	15-Feb-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:	02316.2584USP5

Filed as Large Entity

Provisional Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Late provisional filing fee/cover sheet	1052	1	50	50
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	50

Electronic Acknowledgement Receipt

EFS ID:	3254822
Application Number:	61029248
International Application Number:	
Confirmation Number:	4574
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:	02316.2584USP5
Receipt Date:	05-MAY-2008
Filing Date:	15-FEB-2008
Time Stamp:	16:20:08
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$50
RAM confirmation Number	1666
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	Provisional Cover Sheet (SB16)	Cover_Sheet-updated.PDF	932478 a14c5341592aa023bc1a9ee44fd0dbaacbbef562	no	3
Warnings:					
Information:					
2	Fee Worksheet (PTO-06)	fee-info.pdf	8178 10b57df6da71c3cf98254f8c568226ed4671530a	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	940656		

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.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
61/029,248	02/15/2008		210	02316.2584USP5		

CONFIRMATION NO. 4574

23552
MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

FILING RECEIPT

OC00000028626929

Date Mailed: 03/05/2008

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Applicant(s)

Scott C. Kowalczyk, Savage, MN;
Jonathan Walter Coan, Savage, MN;
Jonathan Kaml, Residence Not Provided;

Power of Attorney:
Jarett Millar--57679

If Required, Foreign Filing License Granted: 03/04/2008
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 61/029,248**
Projected Publication Date: None, application is not eligible for pre-grant publication
Non-Publication Request: No
Early Publication Request: No
Title

FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
61/029,248	02/15/2008	Scott C. Kowalczyk	02316.2584USP5

CONFIRMATION NO. 4574

23552
MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

FORMALITIES LETTER

OC000000028626930

Date Mailed: 03/05/2008

NOTICE TO FILE MISSING PARTS OF PROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(c)

Filing Date Granted

An application number and filing date have been accorded to this provisional application. The items 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 provisional application cover sheet under 37 CFR 1.51(c)(1), which may be an application data sheet (37 CFR 1.76), is required identifying:
  - either city and state, or city and foreign country, of the residence of each inventor.

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 or cover sheet) as set forth in 37 CFR 1.16(g) of $**50** 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 $**50** for a non-small entity
- $**50** Surcharge.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

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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.

/llvuong/

Office of Initial Patent Examination (571) 272-4000 or 1-800-PTO-9199

PTO/SB/16 (04-07)
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U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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Provisional Application for Patent Cover Sheet

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c)

Inventor(s)

Inventor 1 — Remove

Given Name	Middle Name	Family Name	City	State	Country
Scott	C.	Kowalczyk	Savage	MN	US

Inventor 2 — Remove

Given Name	Middle Name	Family Name	City	State	Country
Jonathan	Walter	Coan	Savage	MN	US

Inventor 3 — Remove

Given Name	Middle Name	Family Name	City	State	Country
Jonathan		Kaml			US

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

Title of Invention	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
Attorney Docket Number (if applicable)	02316.2584USP5

Correspondence Address

Direct all correspondence to (select one):

◉ The address corresponding to Customer Number	○ Firm or Individual Name
Customer Number	23552

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

◉ No.

○ Yes, the name of the U.S. Government agency and the Government contract number are:

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◯ Yes, applicant qualifies for small entity status under 37 CFR 1.27

◉ No

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Signature

Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/Jarett D. Millar/			Date (YYYY-MM-DD)	Feb 15, 2008
First Name	Jarett	Last Name	Millar	Registration Number (If appropriate)	57679

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FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

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 mounted to the cable spool so that the termination module unitarily rotates with the cable spool.

Another aspect of the present disclosure relates to a method of paying out a subscriber 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. A termination module is mounted to 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.

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.

The bearing mount 71 is engaged with the cable spool 37. In the subject 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 given

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. In a preferred embodiment, the length of subscriber cable 22, which is coiled around the cable spool 37, is in the range of 100 to 500 feet.

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 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.

It will be understood that the subscriber cable 22 can be paid out while the fiber optic enclosure 21 is mounted to the wall or while the fiber optic enclosure 21 is removed from the wall. In the latter scenario, the subscriber cable 22 could be paid out while the fiber optic enclosure 21 is still packaged in a shipping container provided there is an opening in the shipping container through which the subscriber cable can be pulled.

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.

Referring now to FIGS. 8-17, another embodiment of a fiber optic enclosure 121 is shown including a housing 123, and a hinged cover 125. A cable spool 137 is positioned to rotate within the interior of enclosure 121. Subscriber cable 122 enters at port 131, or at port 132. Both of ports 131, 132 can be provided as knockout portions. Subscriber cable 122 is spooled on spooling portion 139, and selectively paid out by unwinding the cable as needed. Pin openings 141 can be used with a pin to fix the position of cable spool 137 relative to housing 123. 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 cable 122 passes through opening 145 to a fanout 147 where the cable is broken out into individual fibers 124 which have connectorized ends 146 (e.g., SC connectors). A cable management spool 161 manages fibers 124. Fingers 162 assist with cable retention. An outer guidewall 163 with a cable finger 164 also assists with cable retention and protection. An adapter plate 149 includes separate openings 151 for each receiving two adapters 401. In the illustrated embodiment, cable spool 137 is integrally formed, such as from plastic, with the various components shown in FIG. 16. After cable 122 is paid out and spool 137 locked down, individual connectorized subscriber cables 126 can be connected to fibers 124 at adapters 401 of adapter plate 149. Cables 126 exit enclosure 121 at a port 136. In the illustrated embodiment, port 136 includes a slotted foam member 138 to assist with protection of the interior of enclosure 121.

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 connectedly engaged with the bearing mount such that the cable spool selectively rotates within the housing; and

a termination module mounted to the cable spool so that the termination module unitarily rotates 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 subscriber cable from a fiber optic enclosure, comprising rotating a cable spool, which includes 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, wherein a termination module is mounted to the cable spool.

9. A method of paying out a subscriber cable from a fiber optic enclosure as claimed in claim 8, wherein the termination module is mounted to an axial end of the cable spool.

10. A method of paying out a subscriber 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 subscriber 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 subscriber 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 subscriber cable from a fiber optic enclosure as claimed in claim 8, wherein connectorized ends of a first end of the subscriber cable are connected to adapters disposed in the termination module.

14. A method of paying out a subscriber 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 subscriber 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 subscriber cable.

16. A method of paying out a subscriber 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 subscriber cable has been paid out.

17. A method of paying out a subscriber 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 is mounted to the cable spool so that the termination module unitarily rotates with the cable spool. A method of paying out a subscriber 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 mounted to the cable spool.

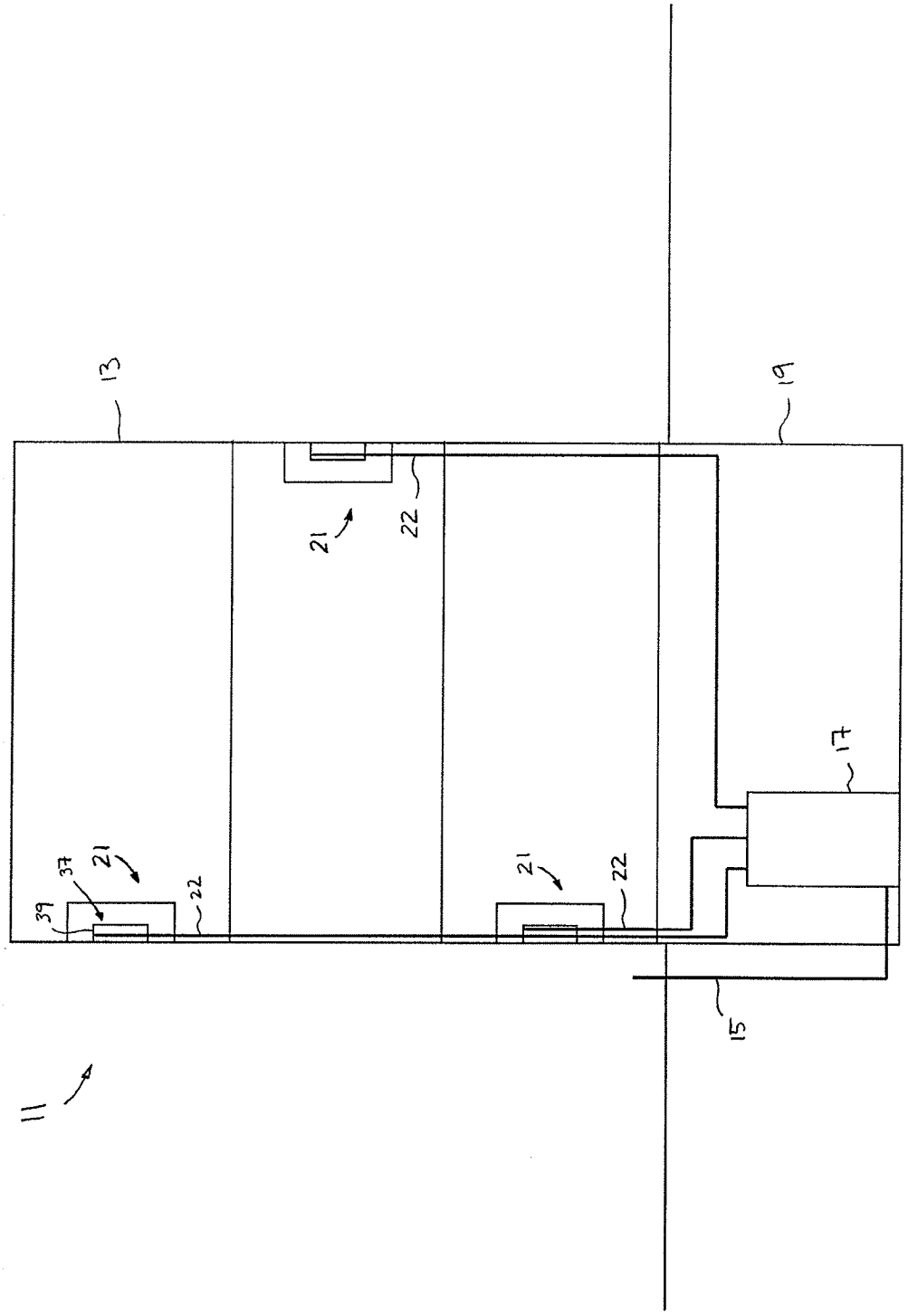

FIG. 1

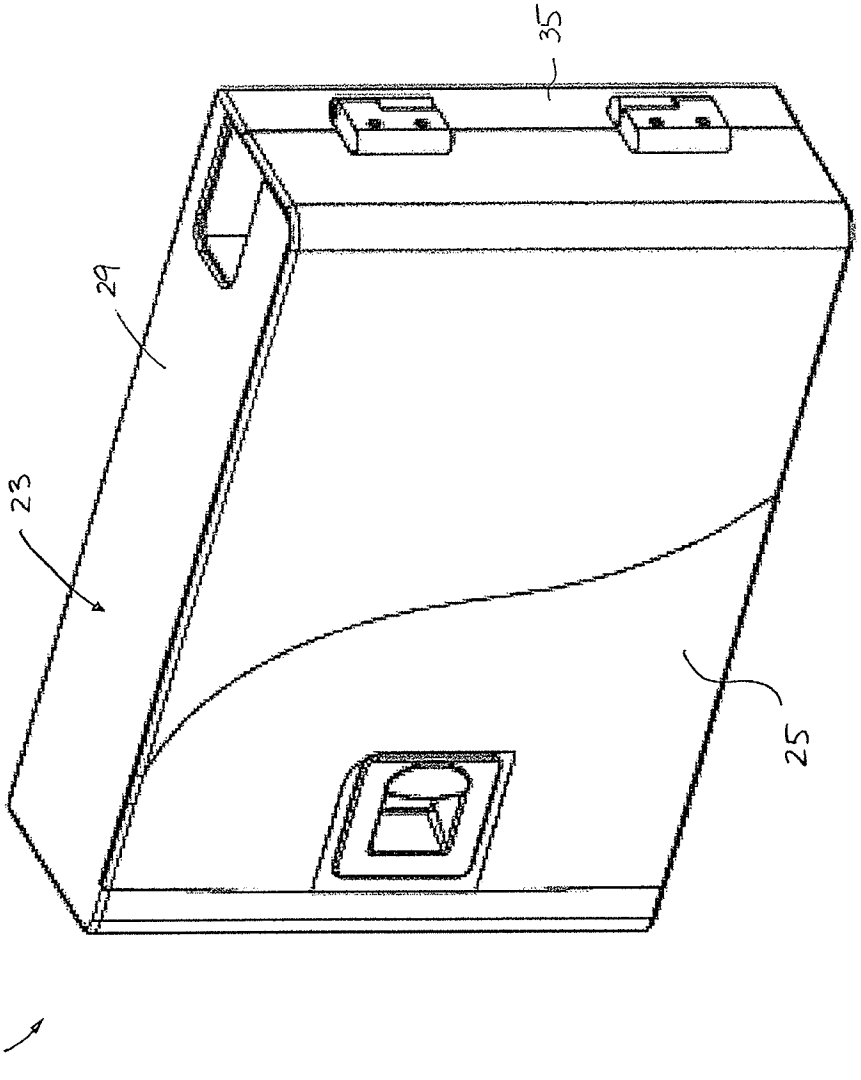

FIG. 2

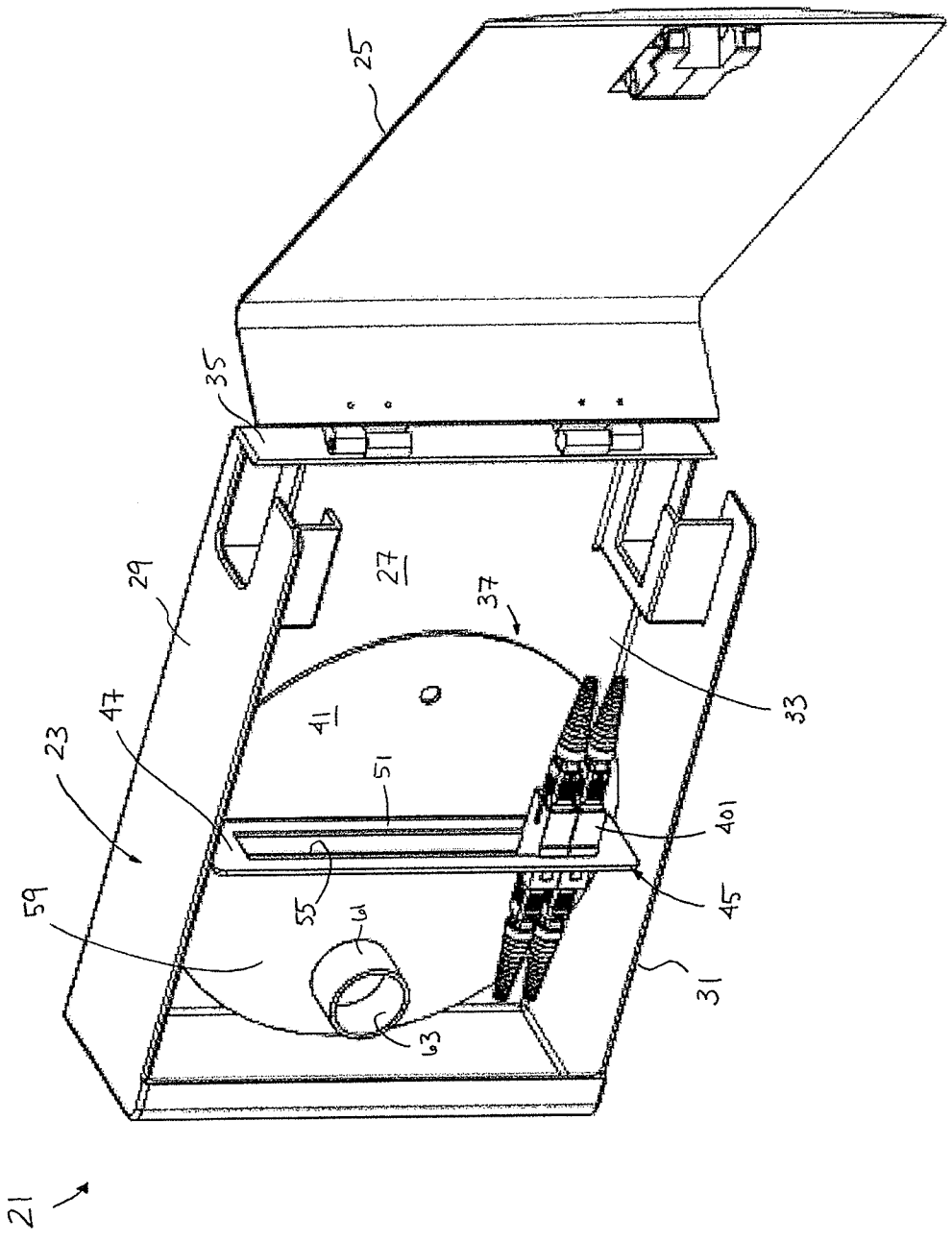

FIG. 3

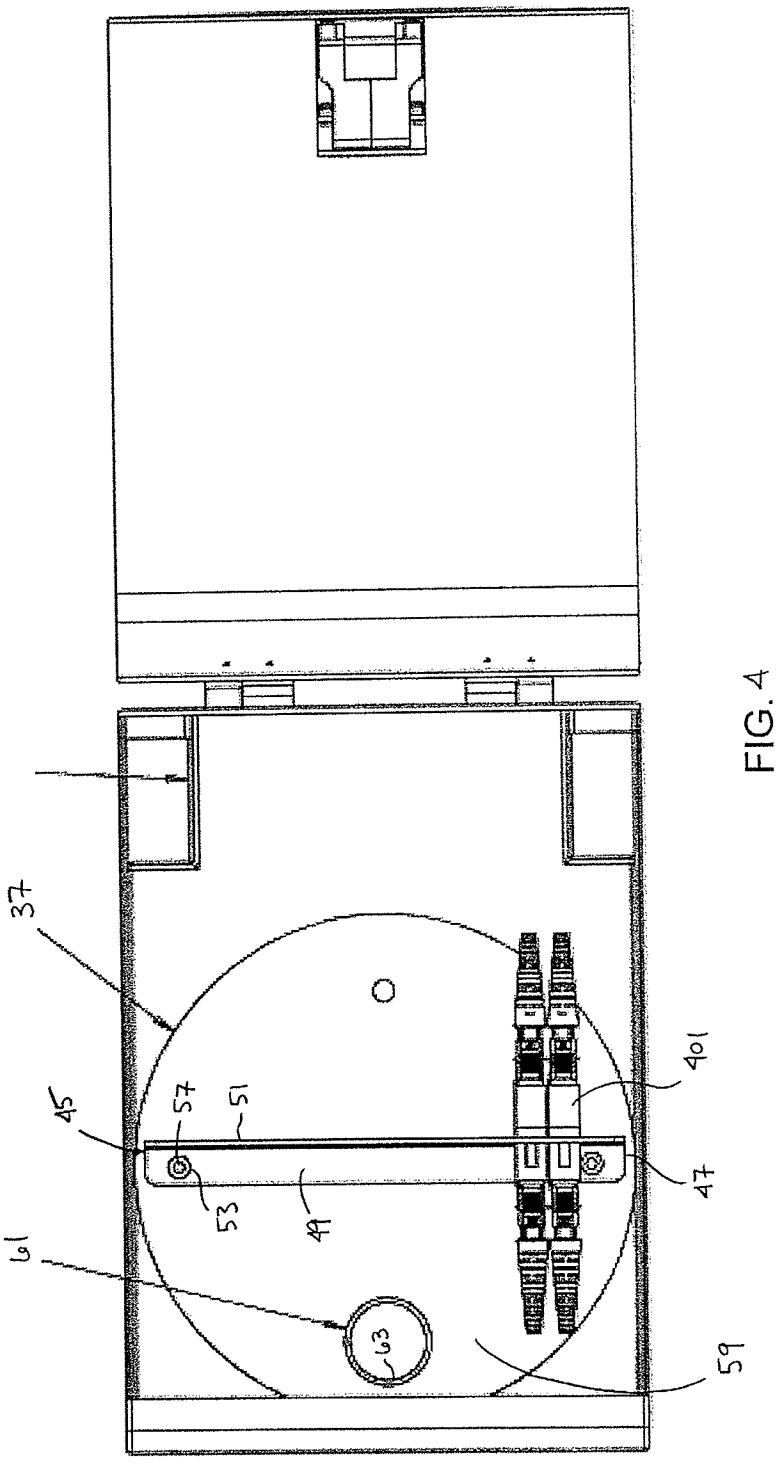

FIG. 4

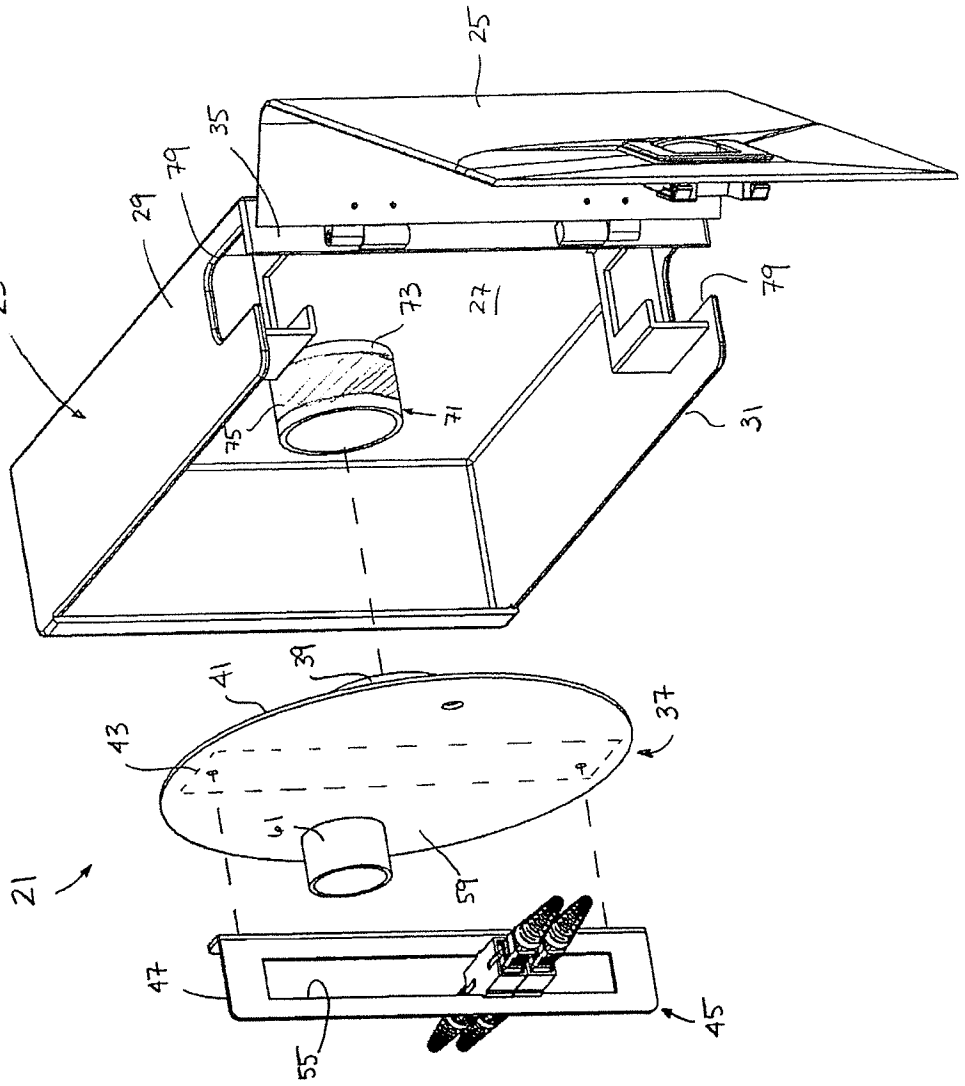

FIG. 5

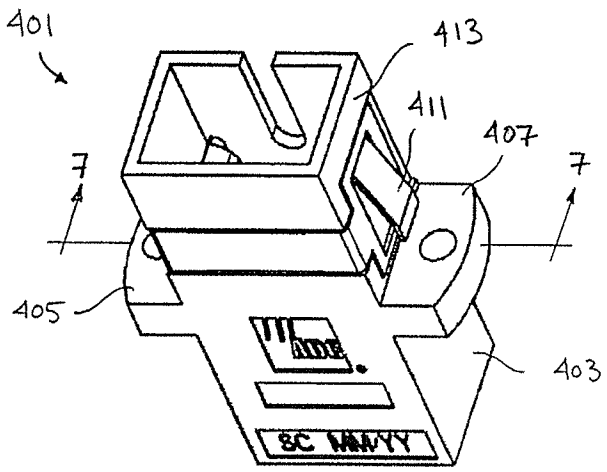

FIG. 6

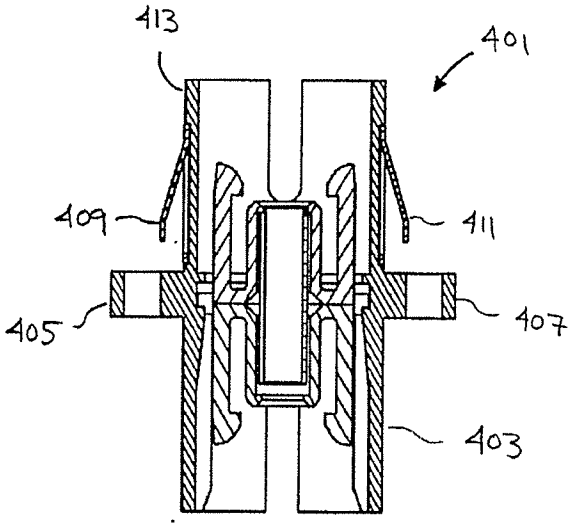

FIG. 7

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FIG. 10

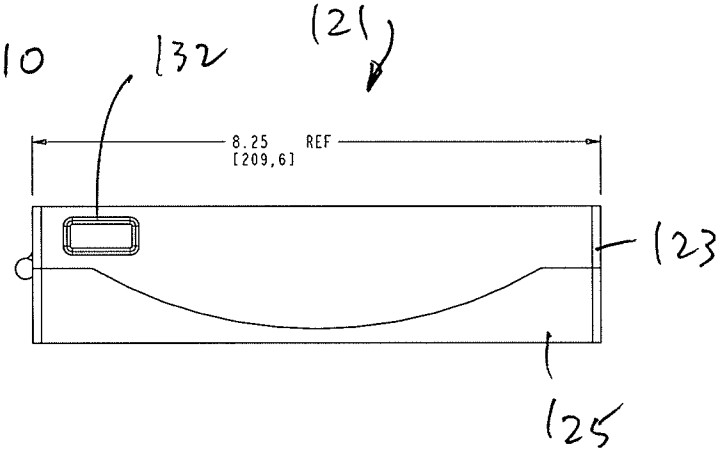


FIG. 8.

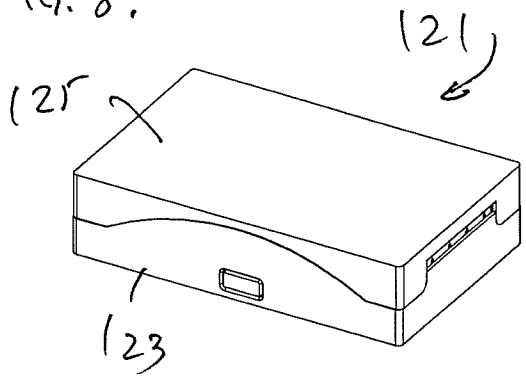


FIG. 9

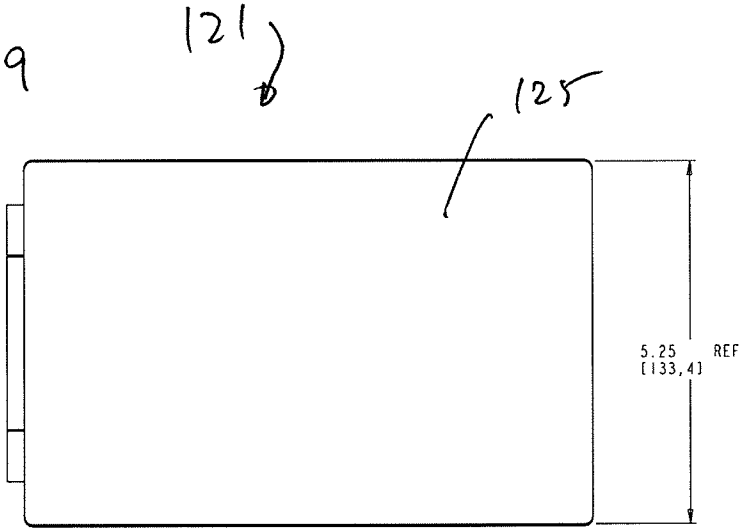
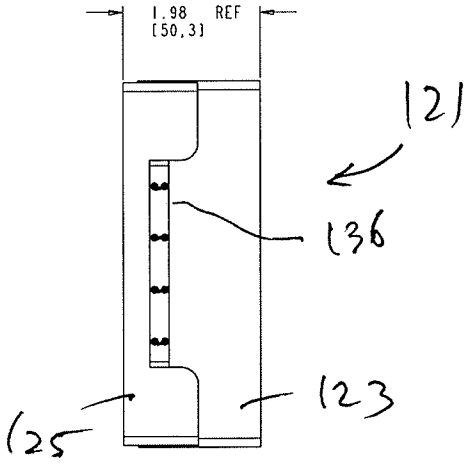


FIG. 11



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ENGR: SCOTT KOWALCZYK

DWN: JONATHAN KAML

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DIMENSIONS IN INCHES
THIRD ANGLE PROJECTION

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FIG. 14

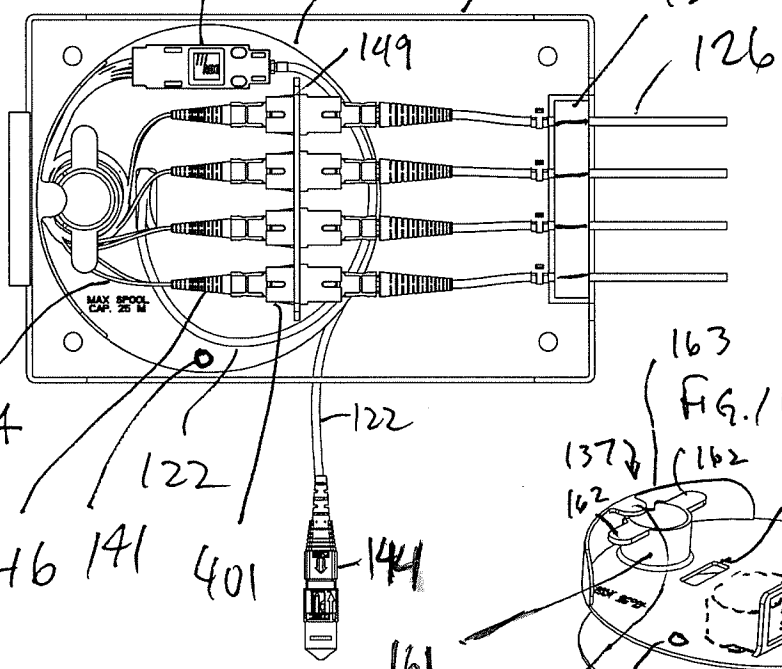


FIG. 15

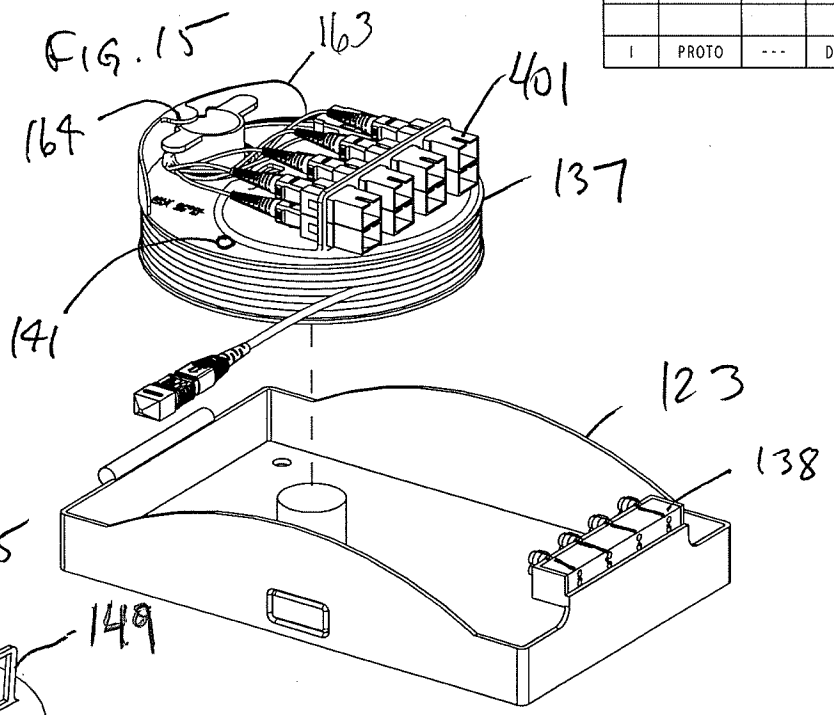


FIG. 16

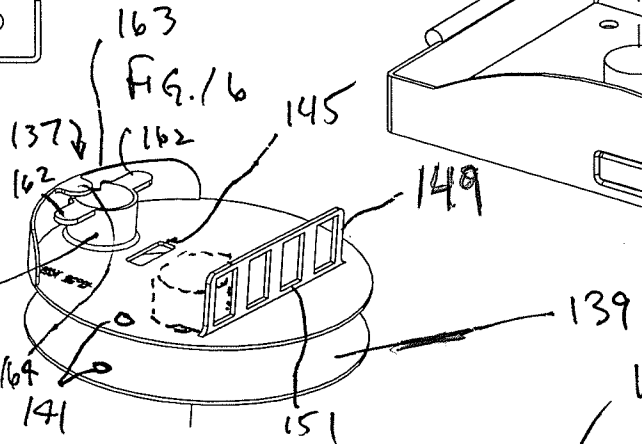


FIG. 12

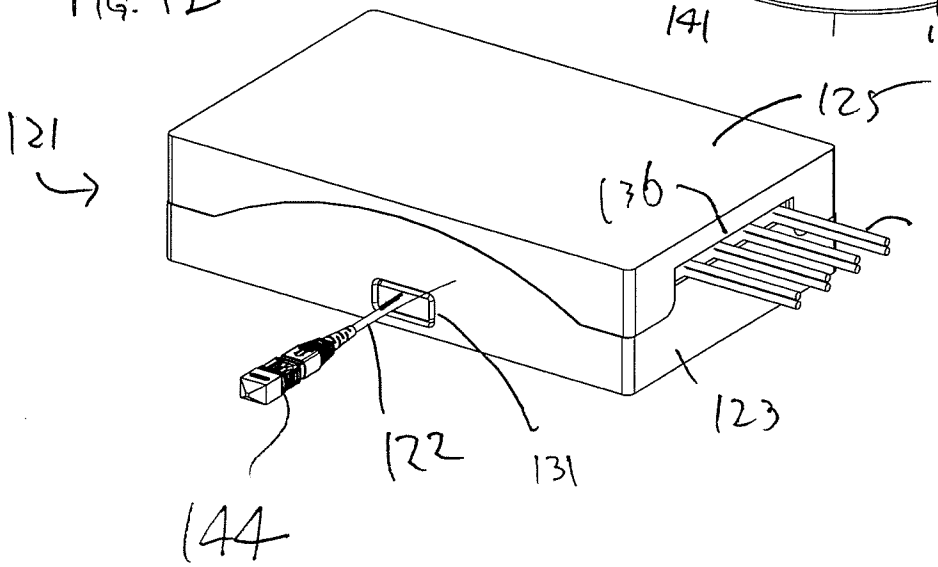
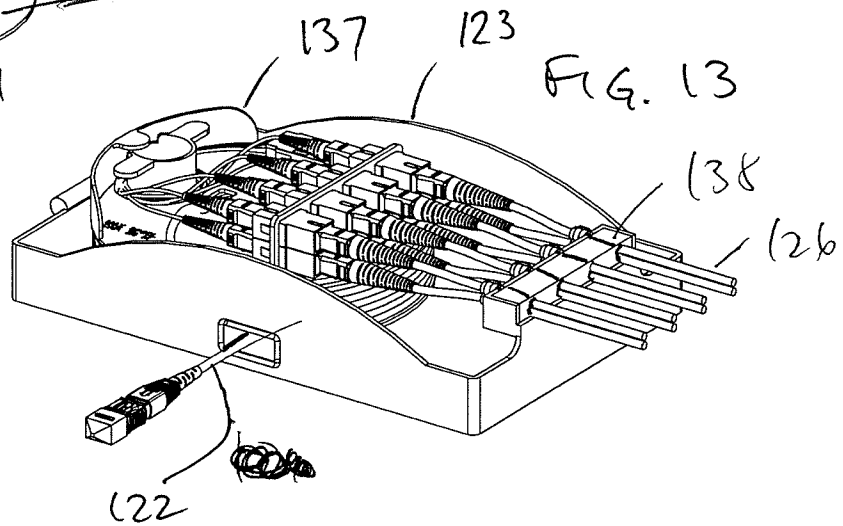


FIG. 13



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ALL DIMS AND TOLERANCES ARE INCHES UNLESS OTHERWISE SPECIFIED .XX:±xx .XXX:±xxx ANGULAR:±N/A

C SIZE | DRAWING NUMBER KAMLJ_PATENT | 1 REV

DO NOT SCALE DRAWING

ENGR: SCOTT KOWALCZYK

DWN: JONATHAN KAML

SHT. 1 OF 1

DIMENSIONS IN INCHES
THIRD ANGLE PROJECTION

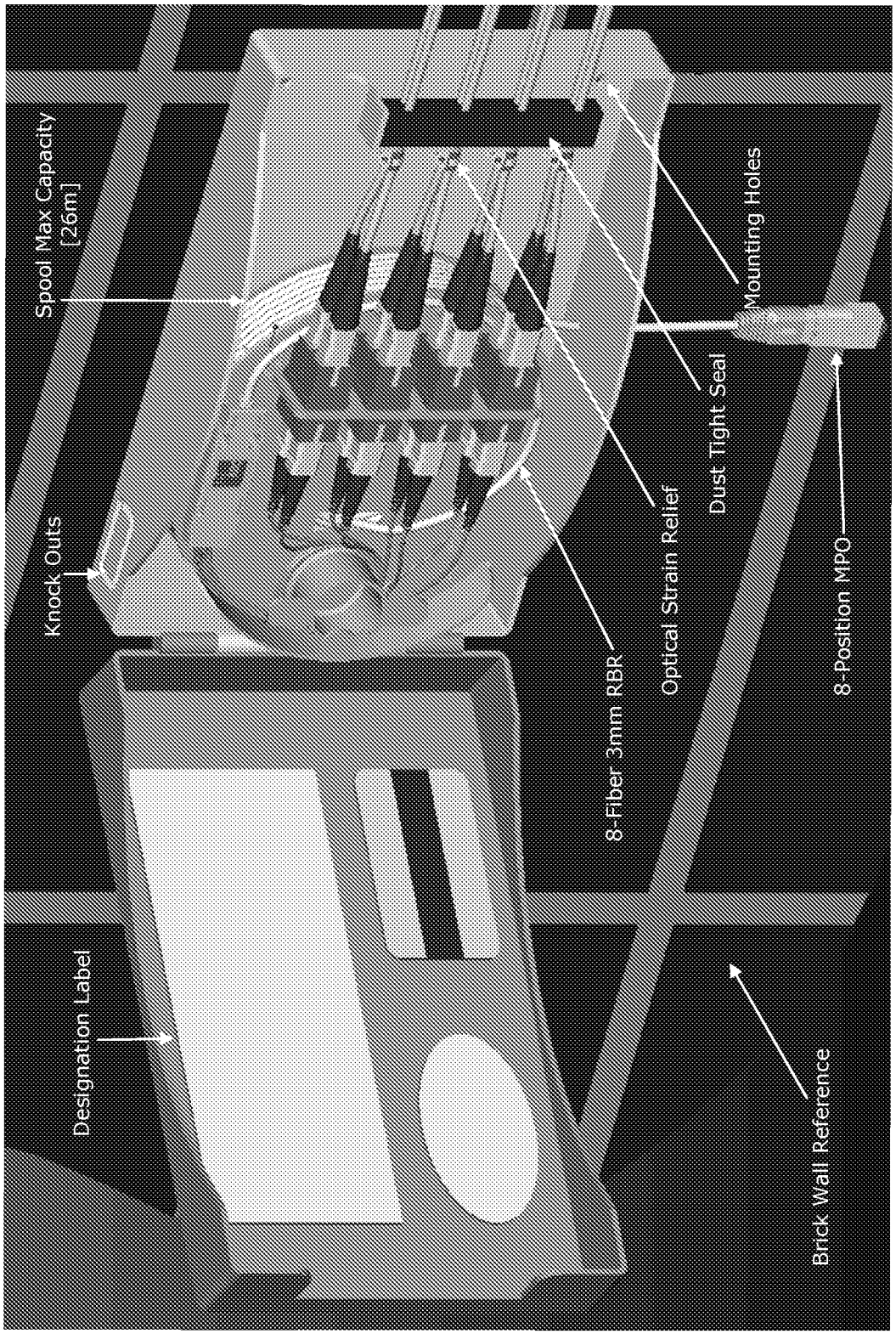
Spool Max Capacity [26m]
Knock Outs
Designation Label
Brick Wall Reference
8-Fiber 3mm RBR
Optical Strain Relief
Dust Tight Seal
Mounting Holes
8-Position MPO

FIG. 17

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
Attorney Docket Number:	02316.2584USP5

Filed as Large Entity

Provisional Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Provisional application filing	1005	1	210	210
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($)
Miscellaneous:				
			Total in USD ($)	210

Electronic Acknowledgement Receipt

EFS ID:	2870864
Application Number:	61029248
International Application Number:	
Confirmation Number:	4574
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
Filer Authorized By:	
Attorney Docket Number:	02316.2584USP5
Receipt Date:	15-FEB-2008
Filing Date:	
Time Stamp:	19:03:11
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$210
RAM confirmation Number	3584
Deposit Account	132725
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)

1	Provisional Cover Sheet (SB16)	Cover_Sheet.pdf	730035 88573583d653e152280a397df25eb03c5e8262ad	no	3
Warnings:					
Information:					
2		Application.pdf	48772 81d5917adeb835886ae7f114c35a04943a18ca29	yes	12

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Specification	1	8
	Claims	9	11
	Abstract	12	12

Warnings:					
Information:					
3	Drawings-only black and white line drawings	FIGS1-16.pdf	222561 a9561cb2df487c2a80cc39eeaf46e17cb056167a	no	8
Warnings:					
Information:					
4	Drawings-only black and white line drawings	FIG_17.pdf	3039185 20b531a01a1da940fb5ce57883212092 47eac548	no	1
Warnings:					
Information:					
5	Fee Worksheet (PTO-06)	fee-info.pdf	8130 5f60b5176456ba2786985c55adec6d8e239b49c7	no	2
Warnings:					
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		Total Files Size (in bytes):	4048683		

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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.