Inventor: Kowalczyk et al.
Docket No.: 02316.2584USU2
Title: FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
Attorney Name: Jarett D. Millar
Phone No.: 612.371.5736

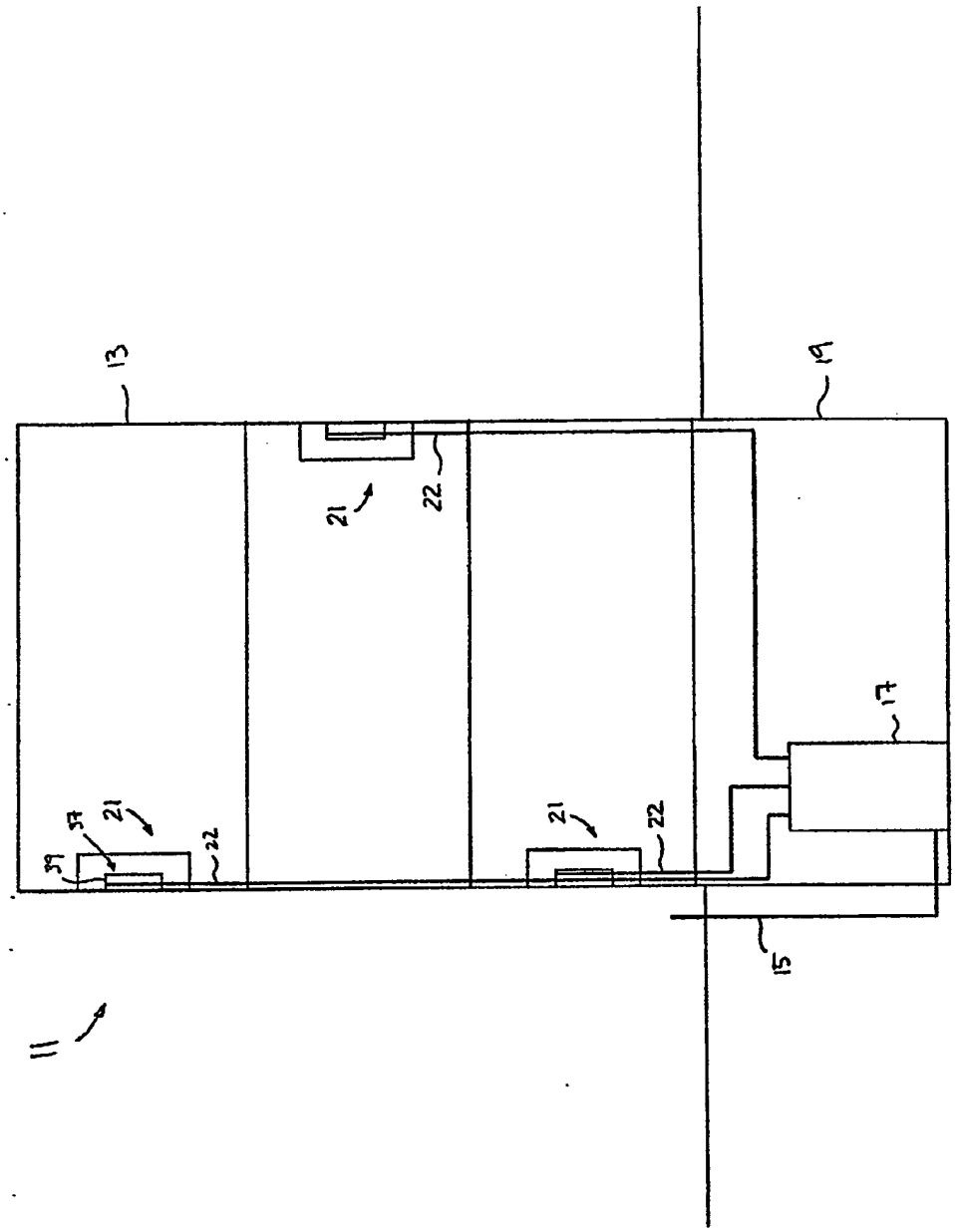


FIG. 1

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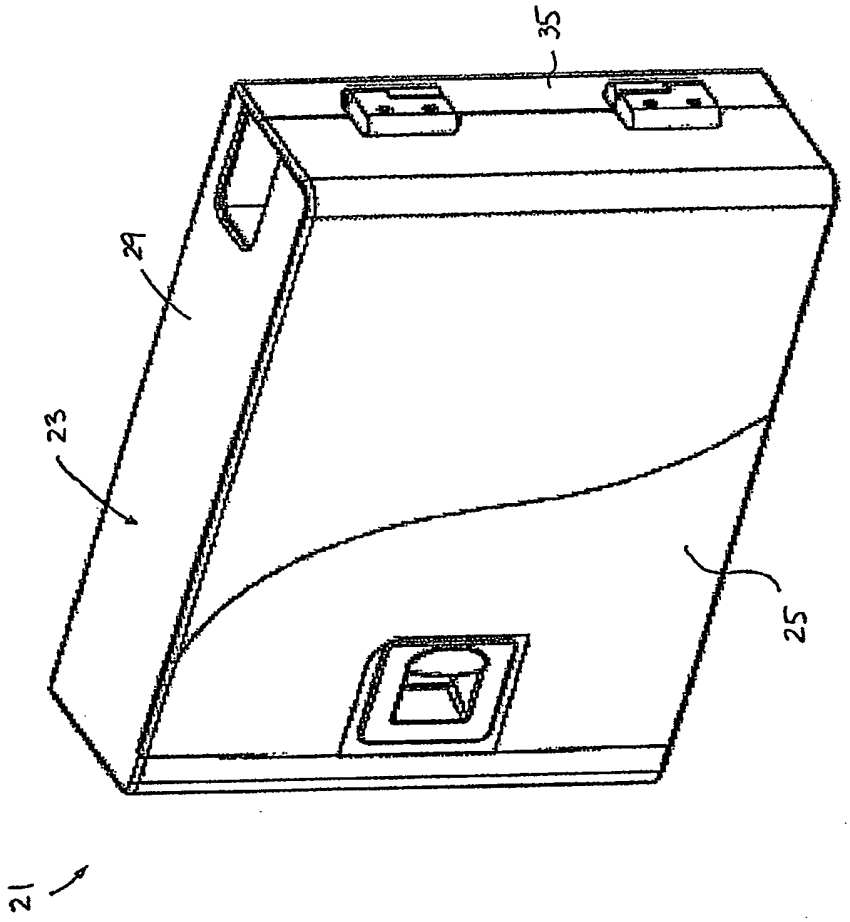


FIG. 2

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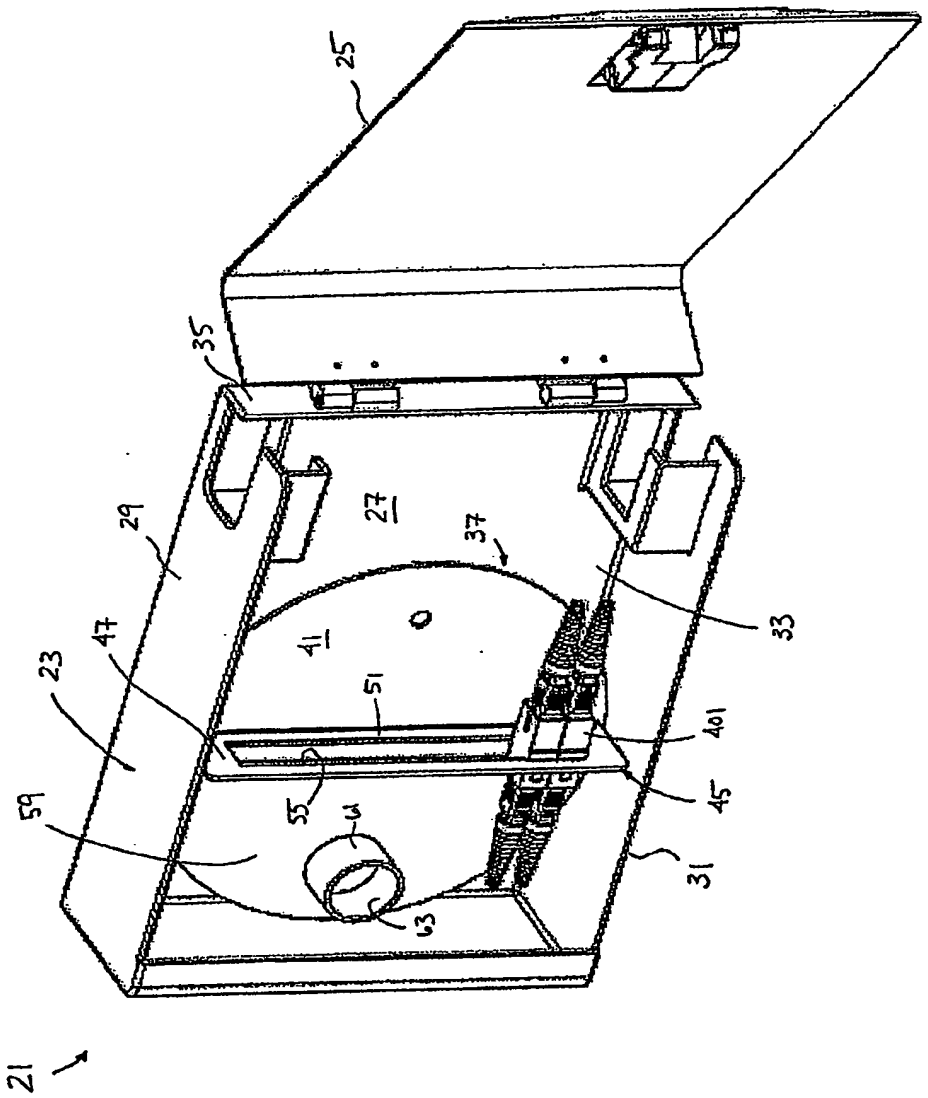


FIG. 3

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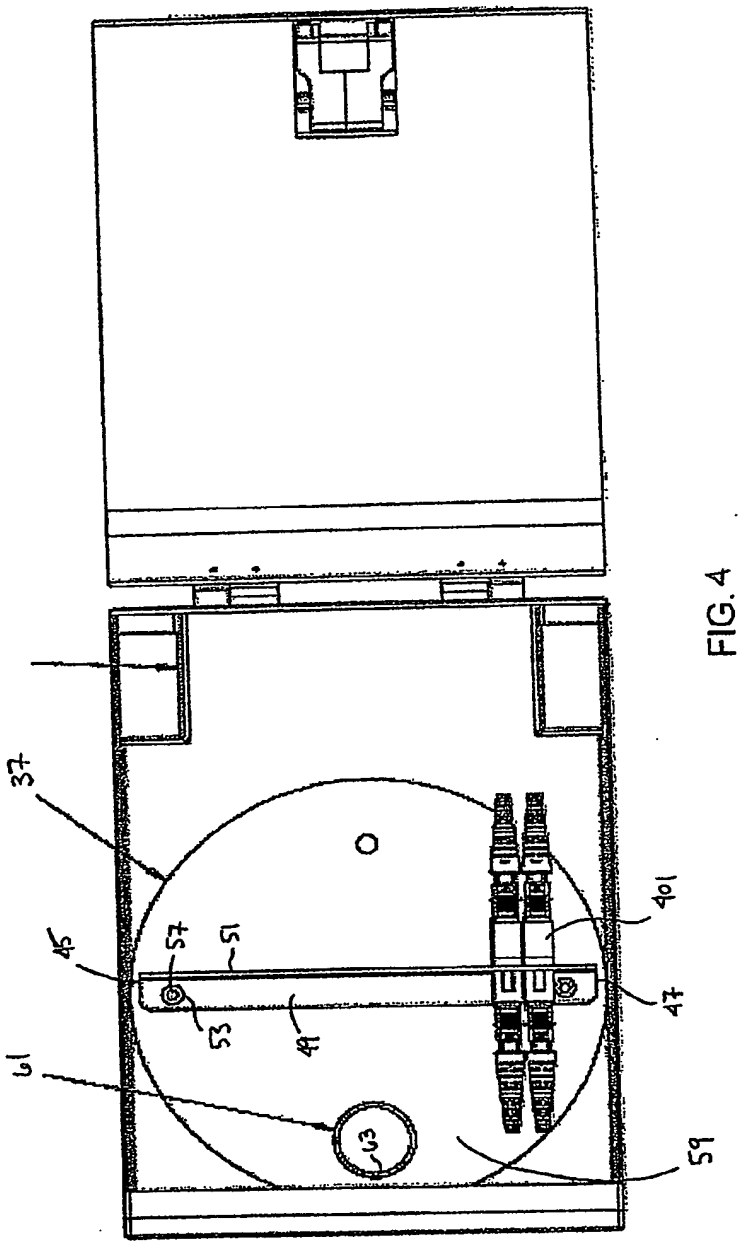


FIG. 4

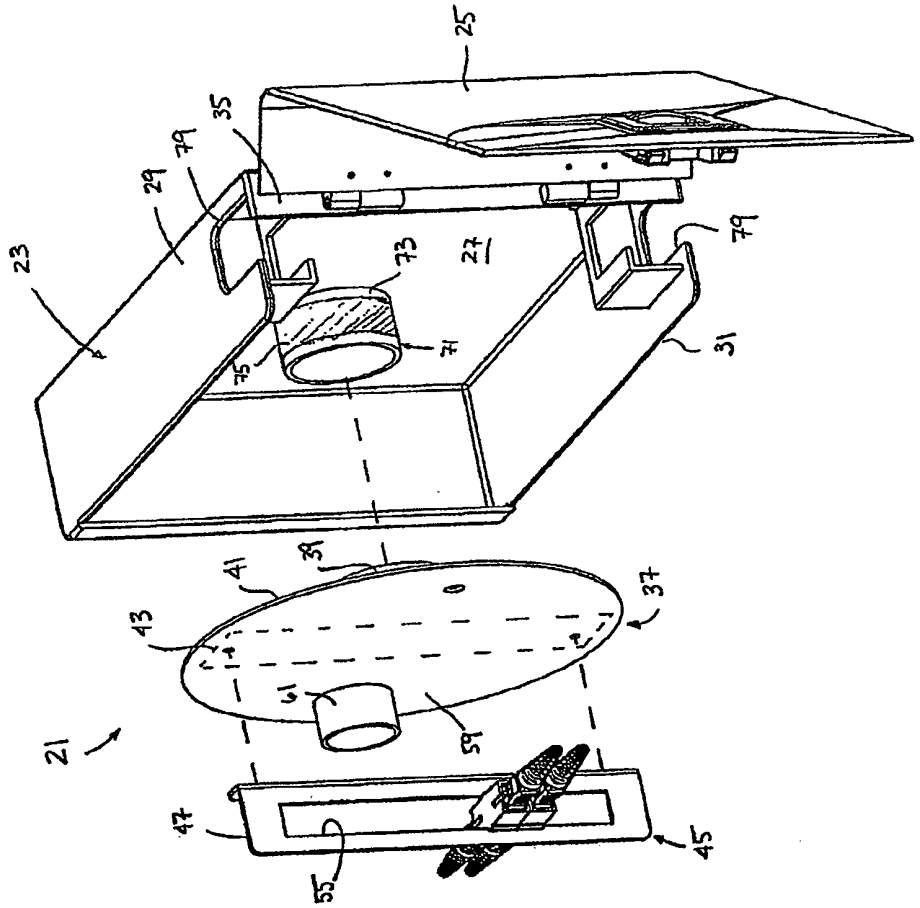


FIG. 5

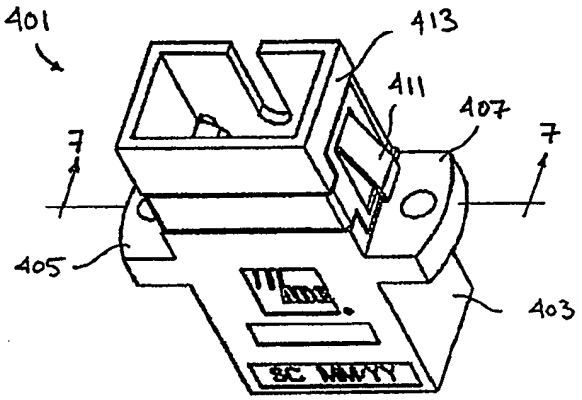


FIG. 6

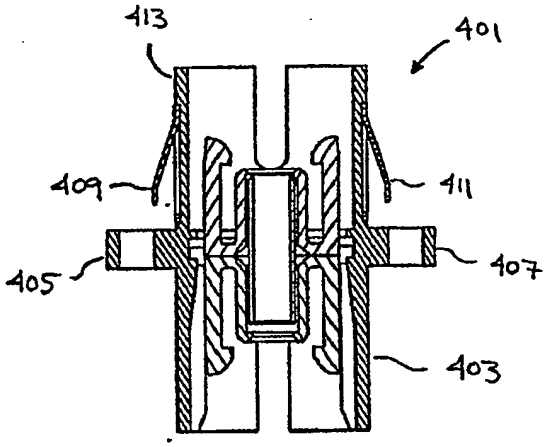


FIG. 7

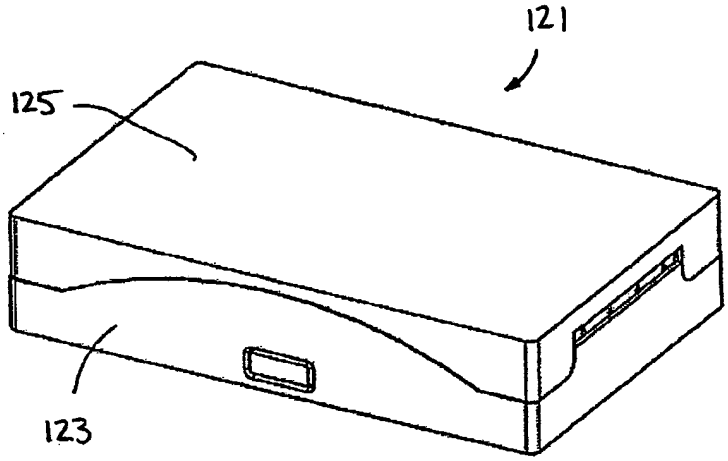


FIG. 8

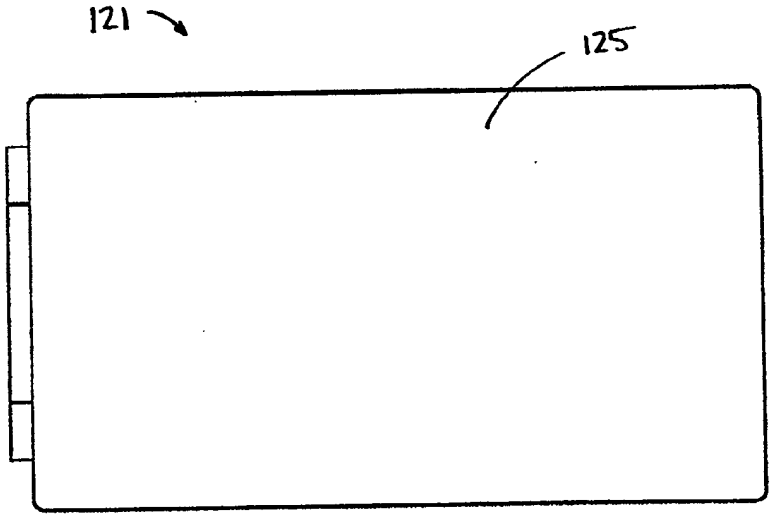


FIG. 9

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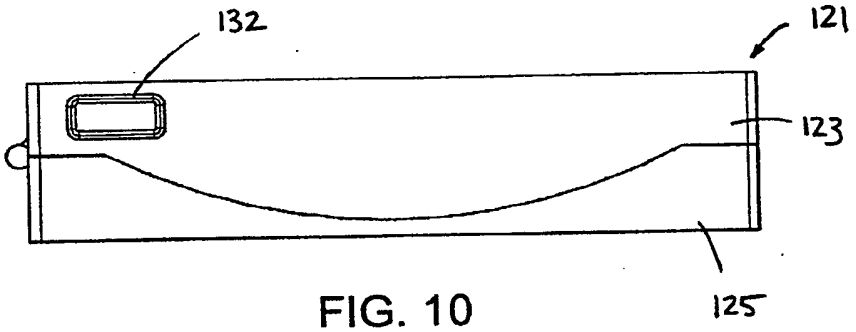


FIG. 10

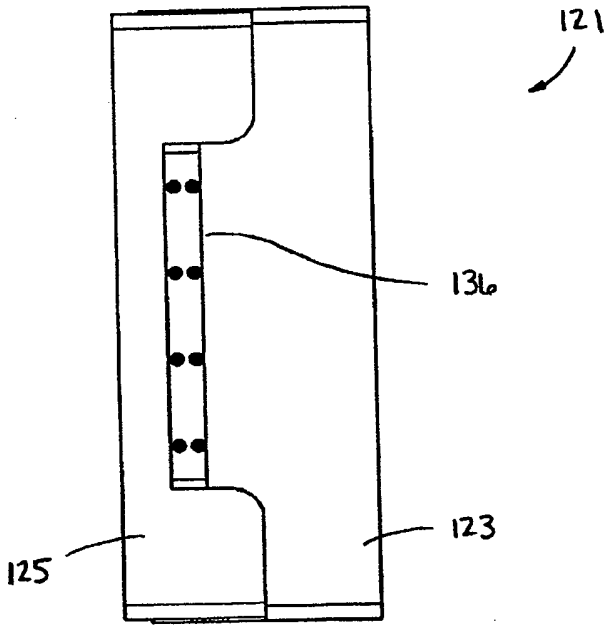


FIG. 11

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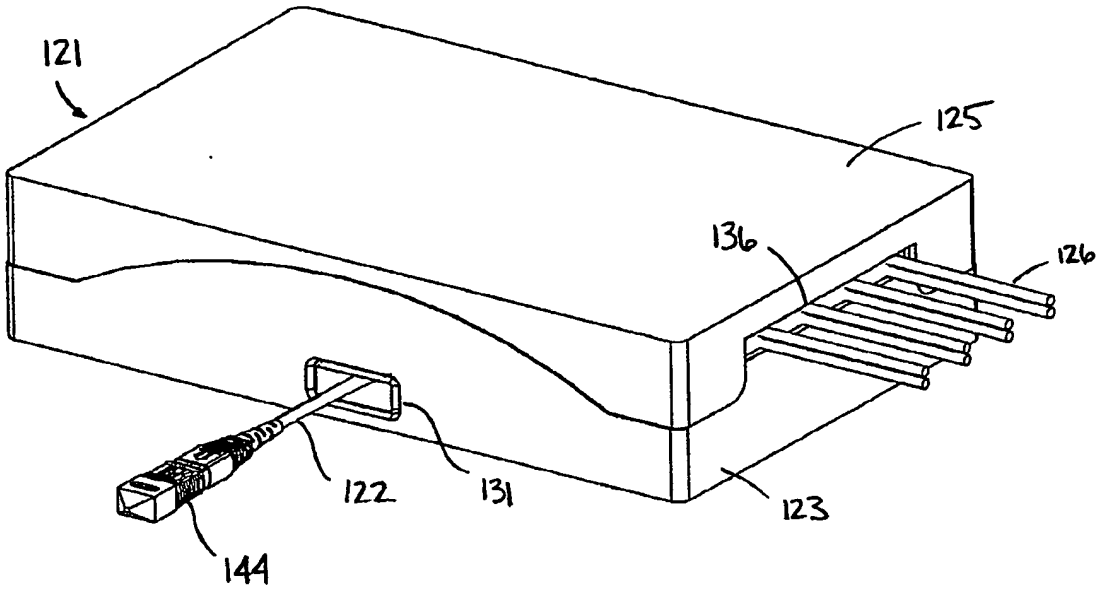


FIG. 12

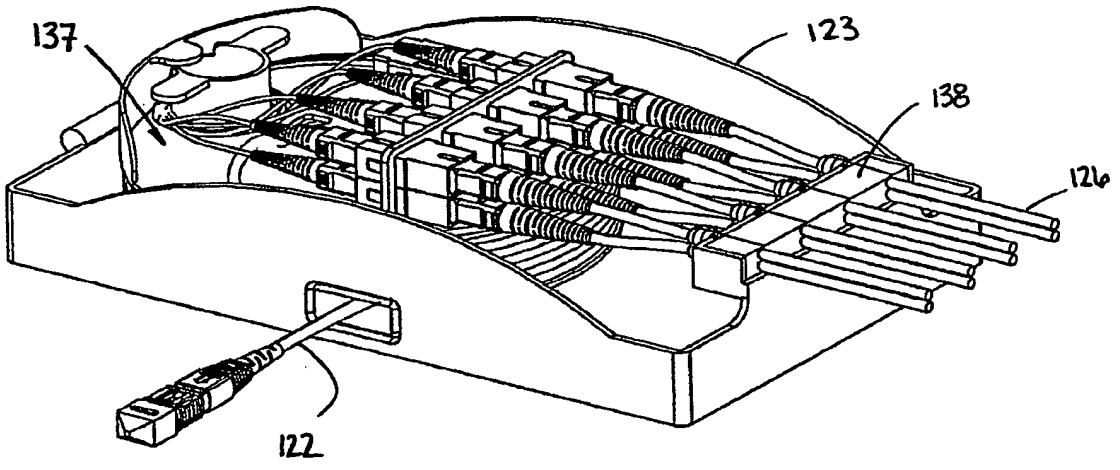


FIG. 13

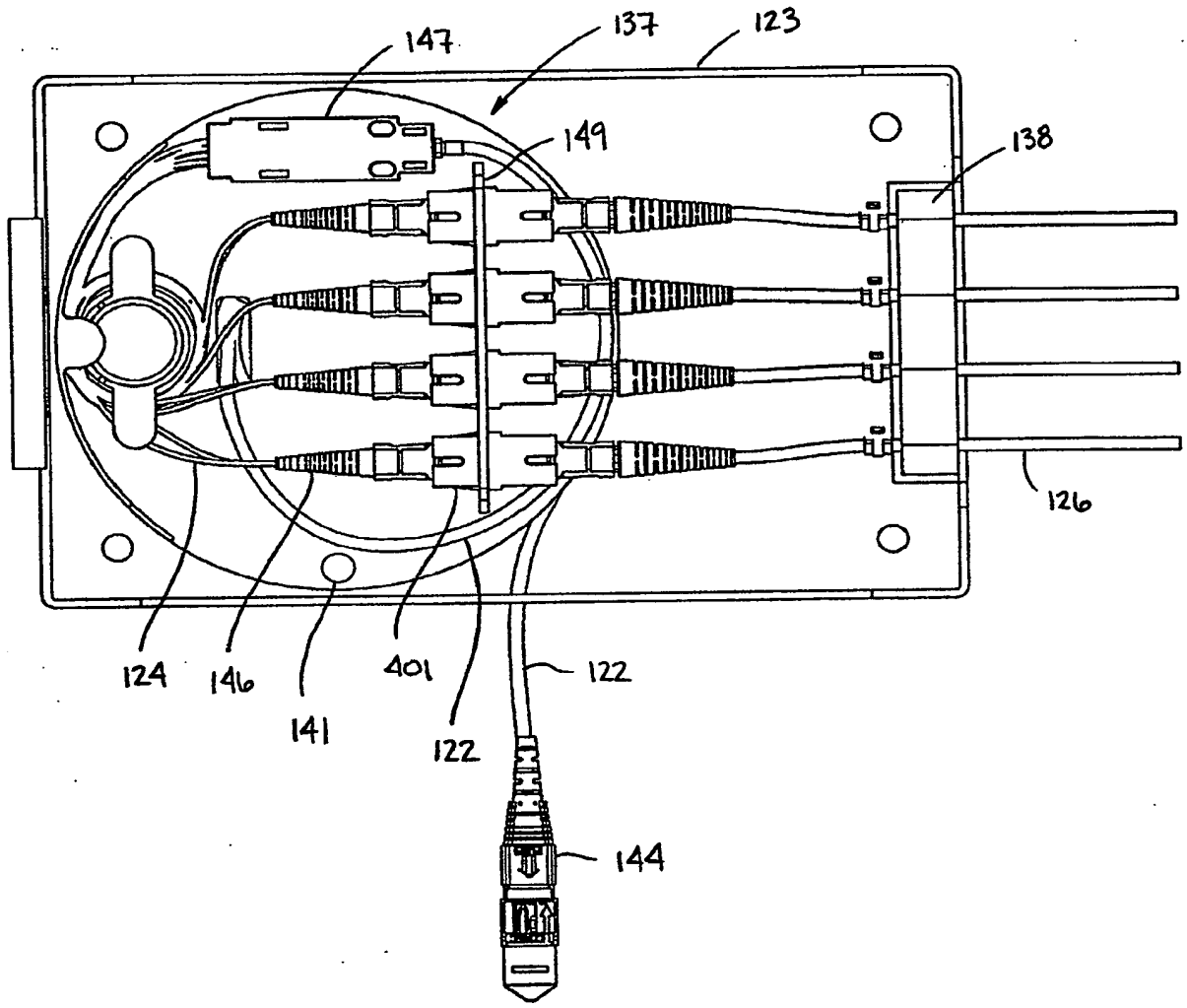


FIG. 14

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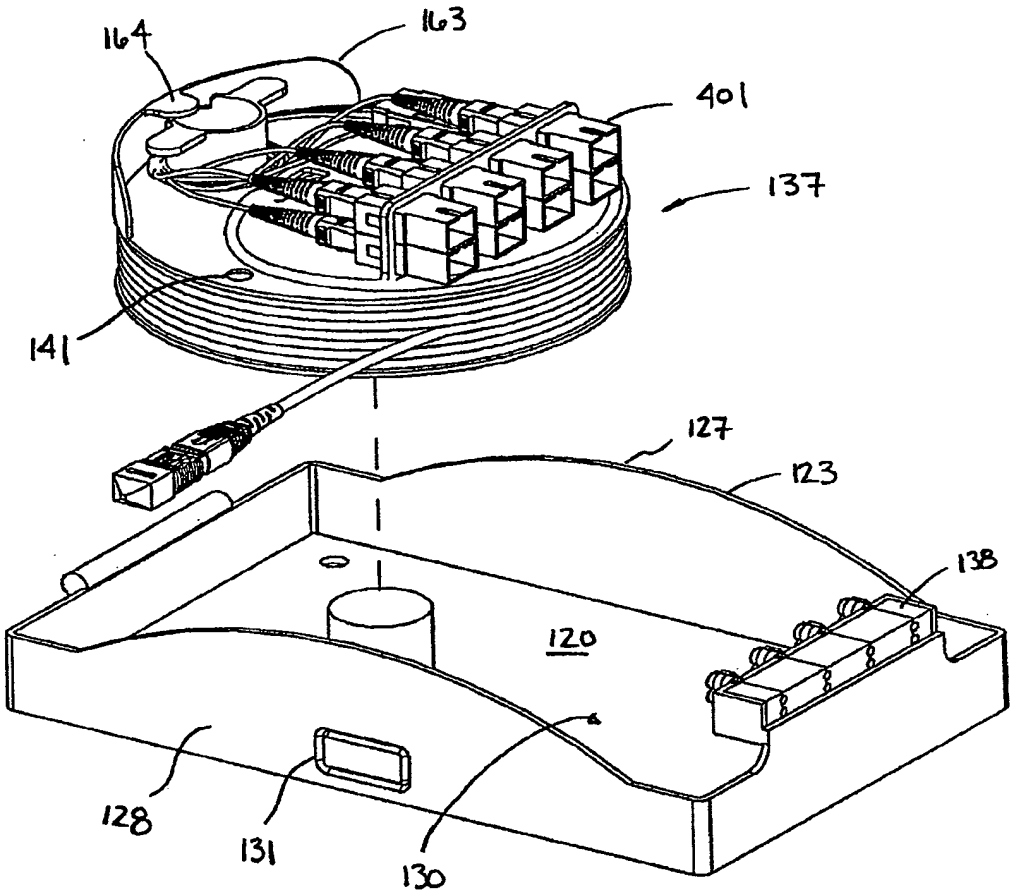


FIG. 15

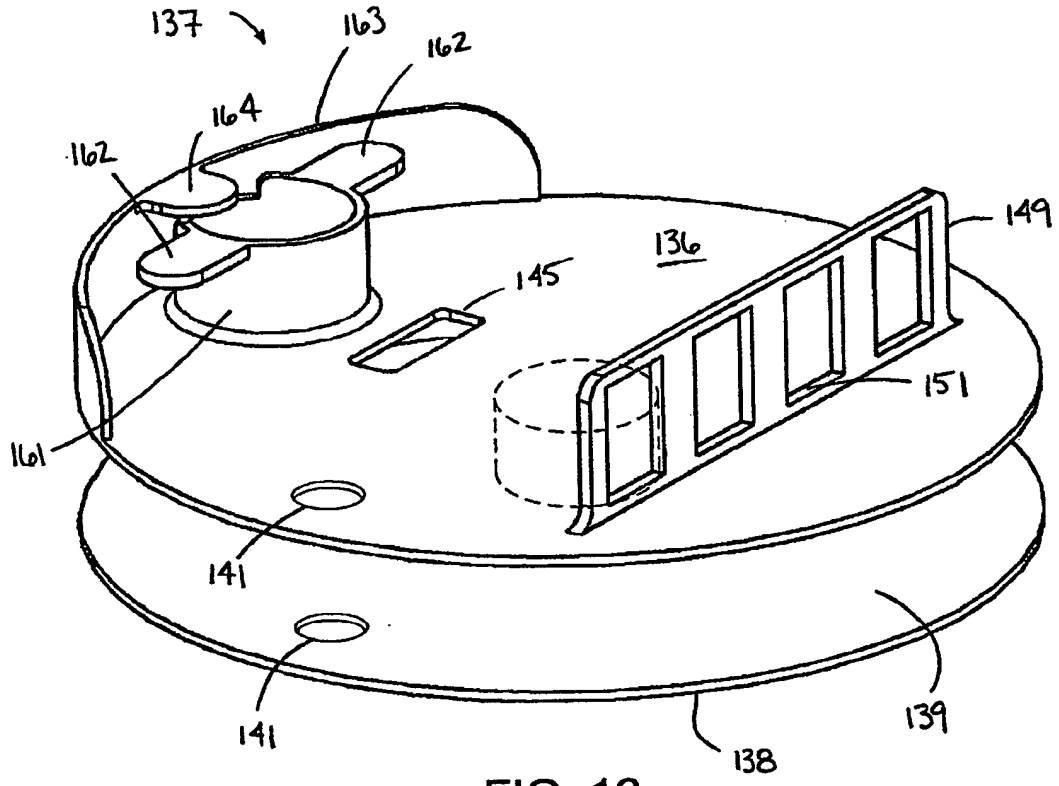


FIG. 16

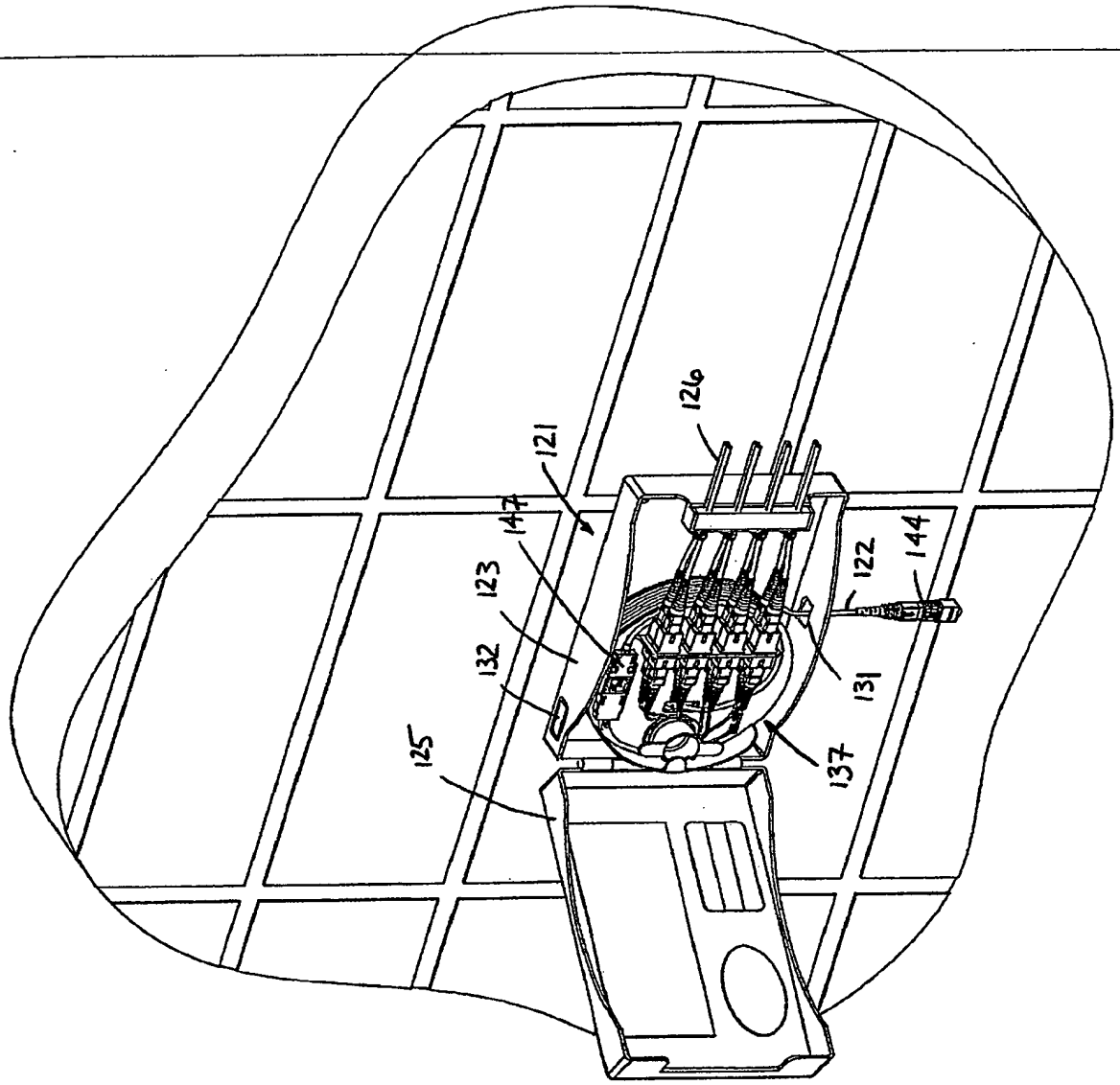


FIG. 17

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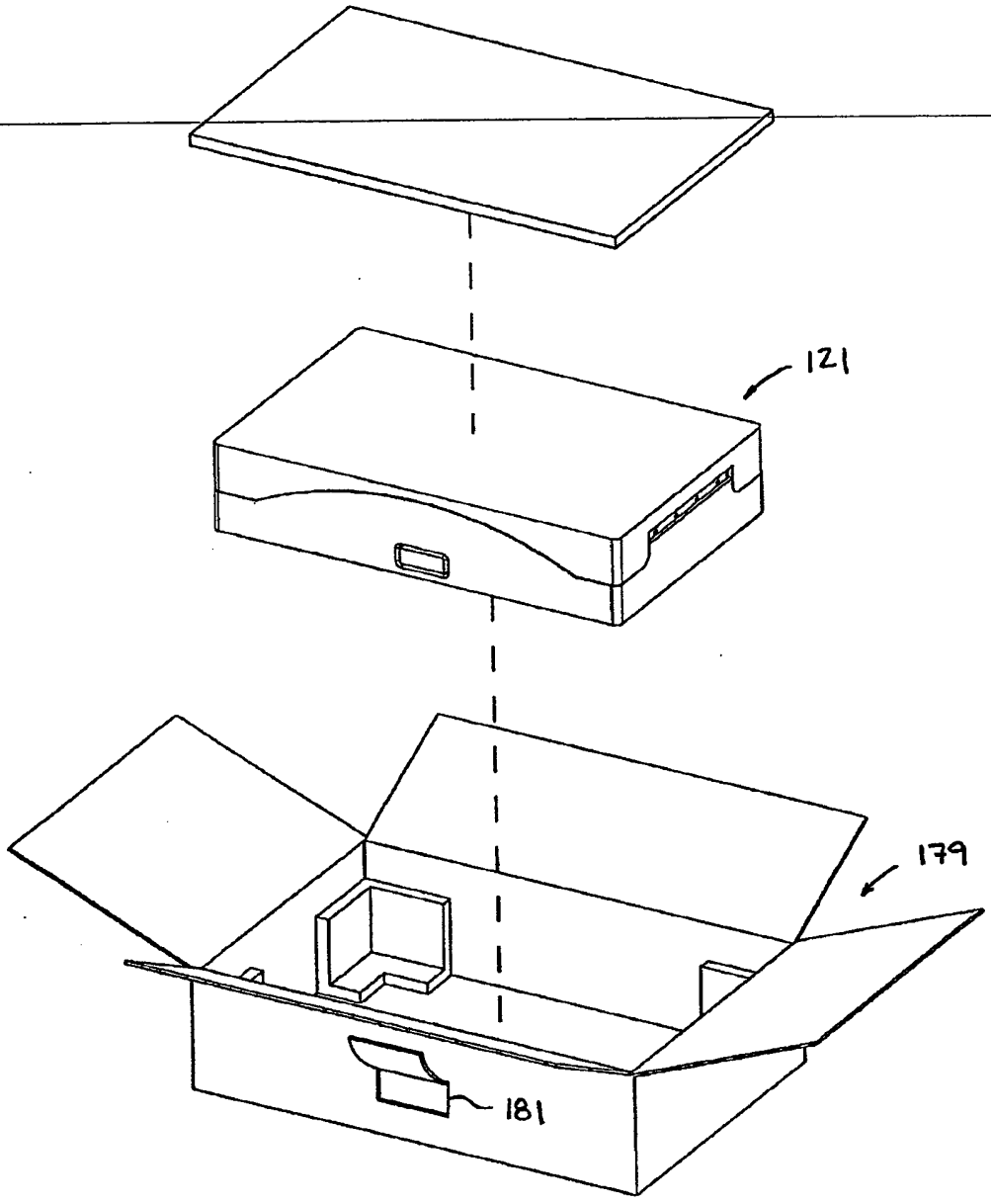


FIG. 18

FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

Cross-Reference to Related Application

This application is being filed on 05 August 2008, as a PCT International Patent application in the name of ADC Telecommunications, Inc., a U.S. national corporation, applicant for the designation of all countries except the U.S., and Scott C. KOWALCZYK, a citizen of the U.S., Jonathan Walter COAN, a citizen of the U.S., and Jonathan KAML, a citizen of the U.S., applicants for the designation of the U.S. only, and claims priority to U.S. Provisional Patent Application Serial No. 60/954,214 filed on 06 August 2007, U.S. Provisional Patent Application Serial No. 61/029,248 filed on 15 February 2008, and U.S. Utility Patent Application Serial No. 12/182,705 filed on 30 July 2008.

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.

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.

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 30 259[illegible]

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

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

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

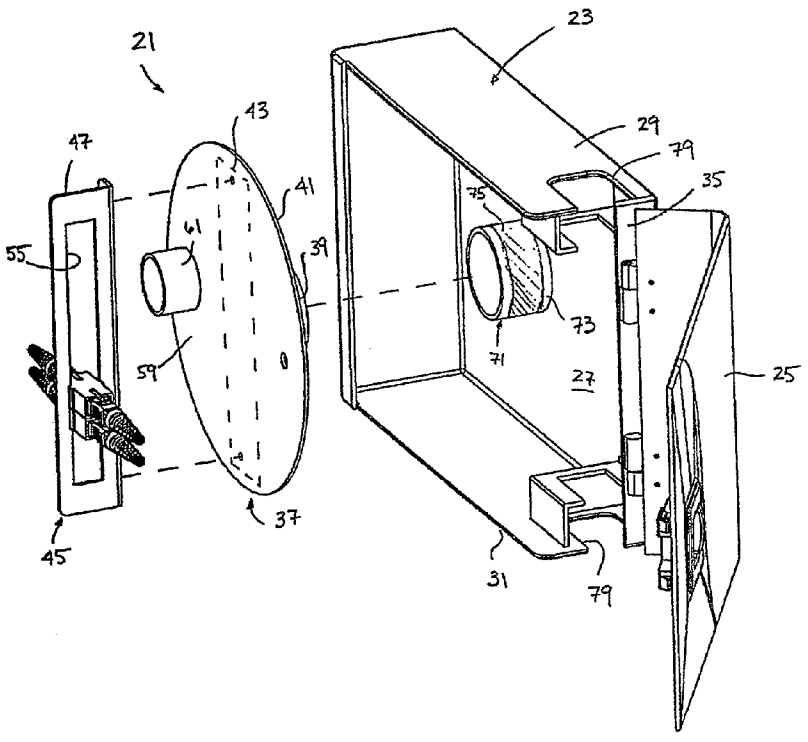


FIG. 5

(57) Abstract: 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).

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European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

Cross-Reference to Related Application

This application is being filed on 05 August 2008, as a PCT International Patent application in the name of ADC Telecommunications, Inc., a U.S. national corporation, applicant for the designation of all countries except the U.S., and Scott C. KOWALCZYK, a citizen of the U.S., Jonathan Walter COAN, a citizen of the U.S., and Jonathan KAML, a citizen of the U.S., applicants for the designation of the U.S. only, and claims priority to U.S. Provisional Patent Application Serial No. 60/954,214 filed on 06 August 2007, U.S. Provisional Patent Application Serial No. 61/029,248 filed on 15 February 2008, and U.S. Utility Patent Application Serial No. 12/182,705 filed on 30 July 2008.

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

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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.

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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.

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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.

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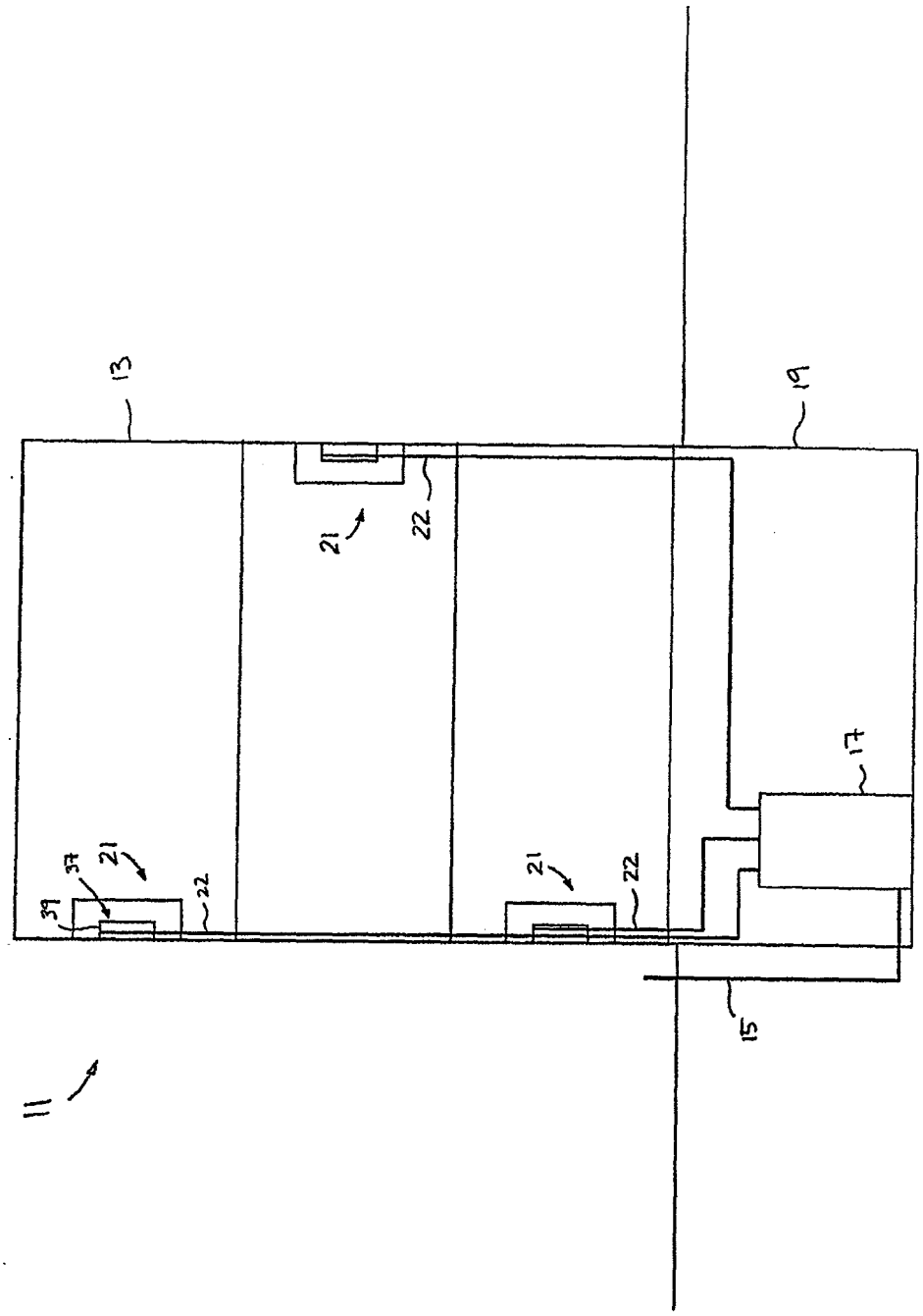


FIG. 1

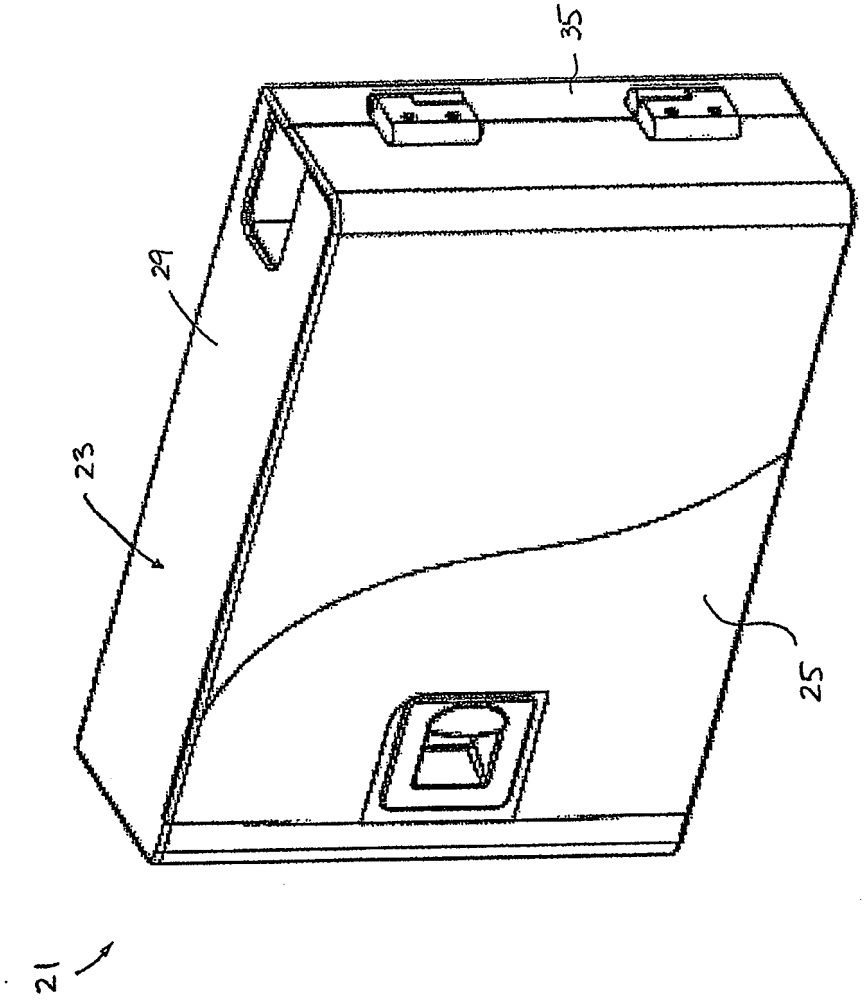


FIG. 2

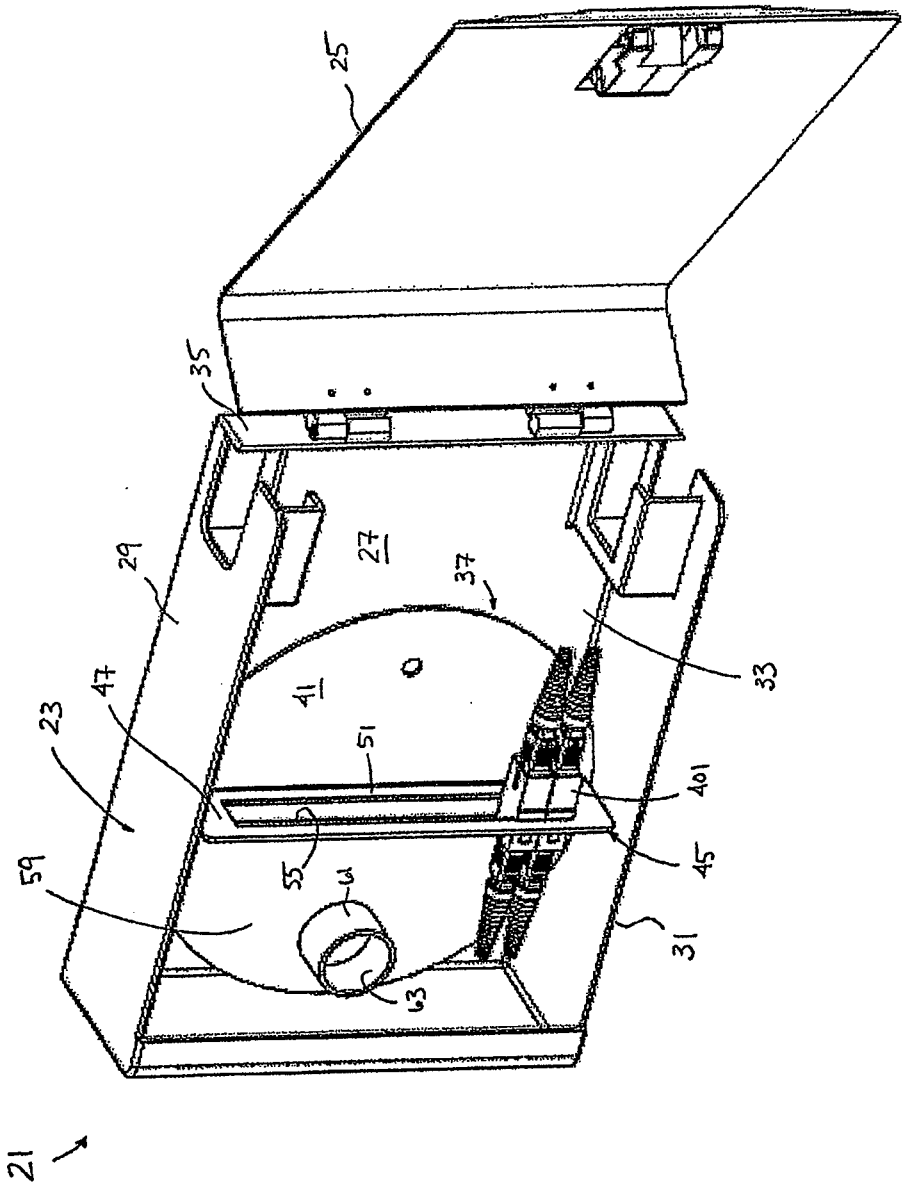


FIG. 3

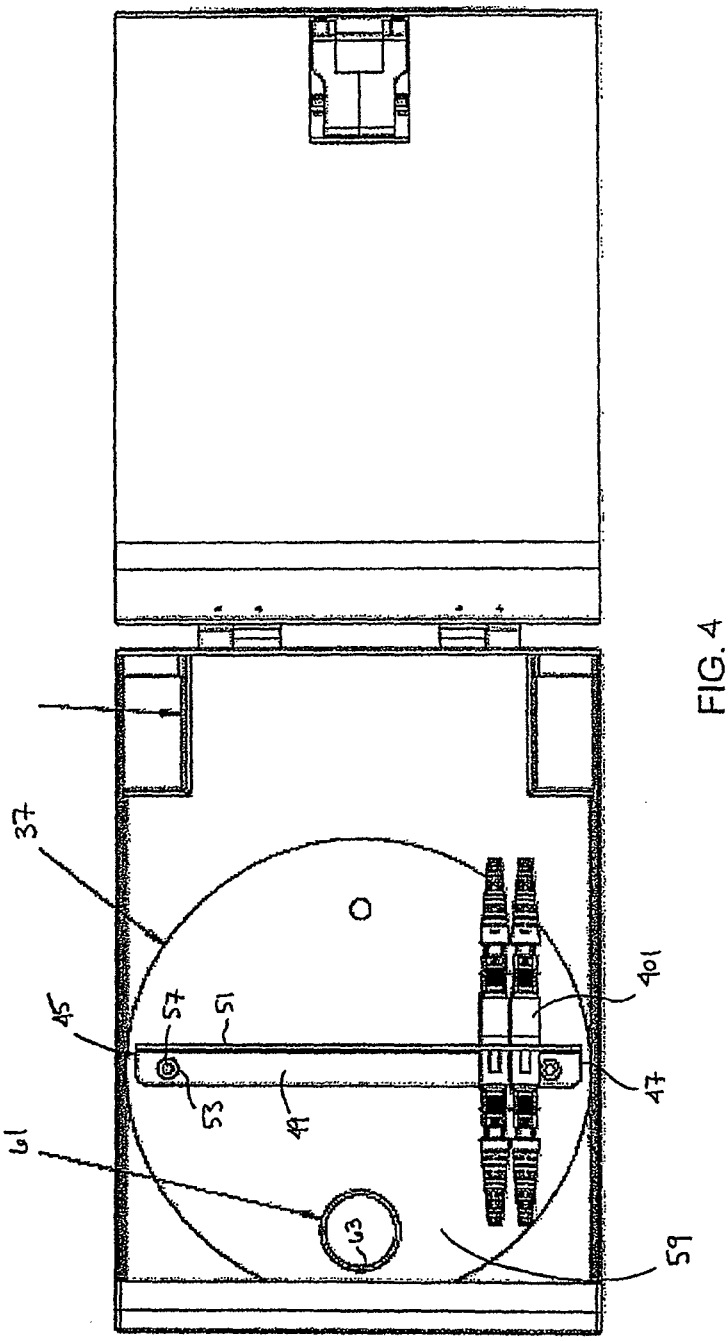


FIG. 4

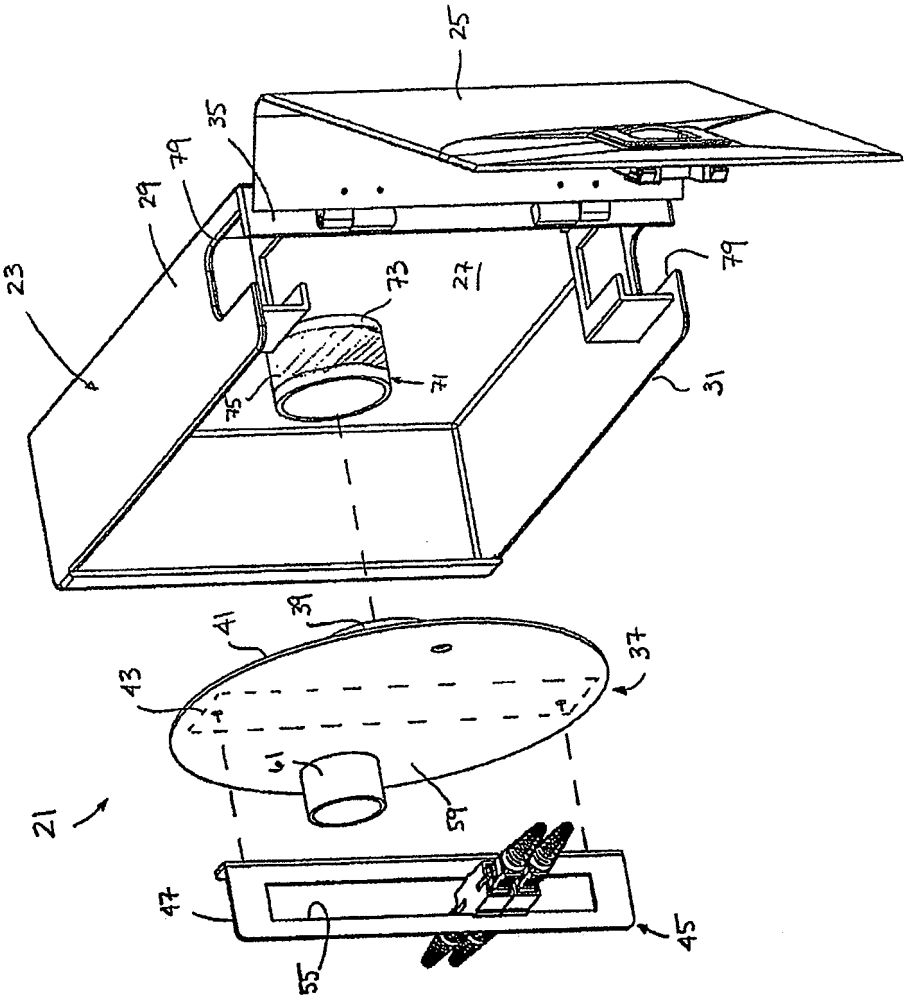


FIG. 5

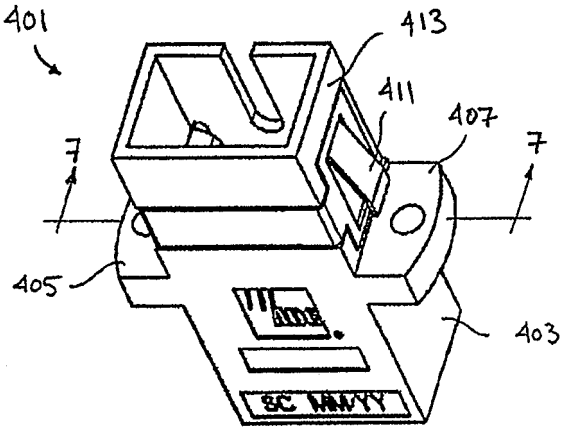


FIG. 6

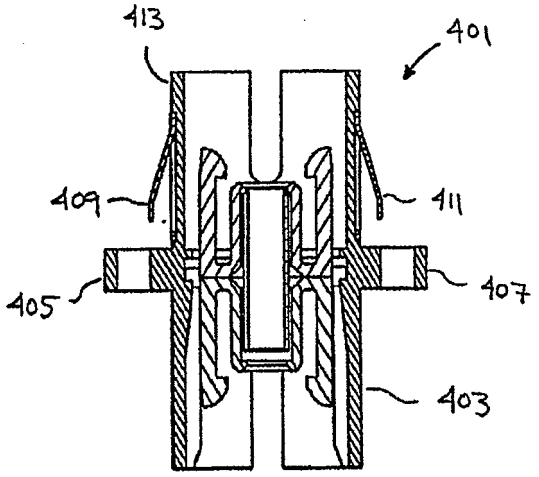


FIG. 7

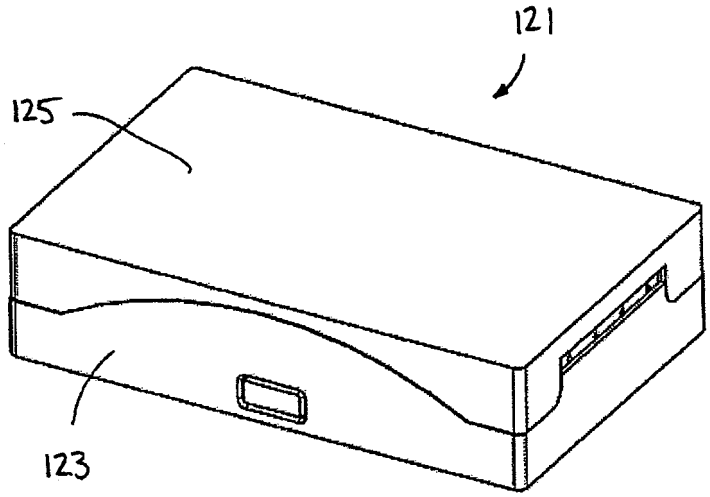


FIG. 8

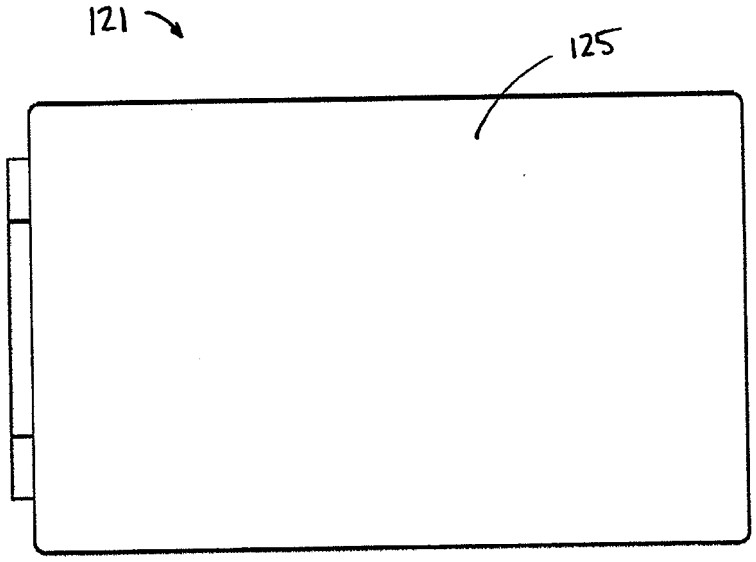


FIG. 9

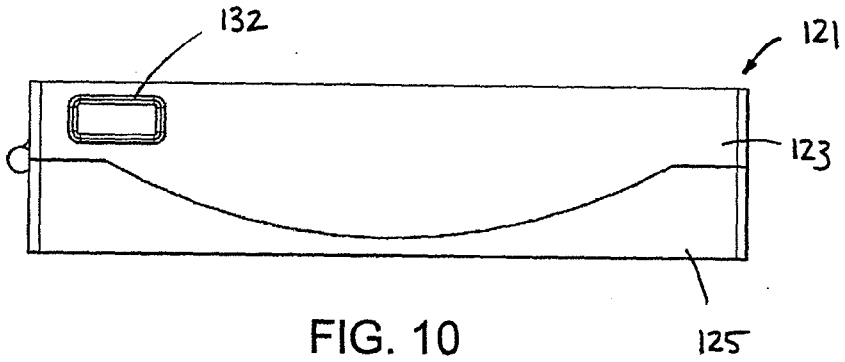


FIG. 10

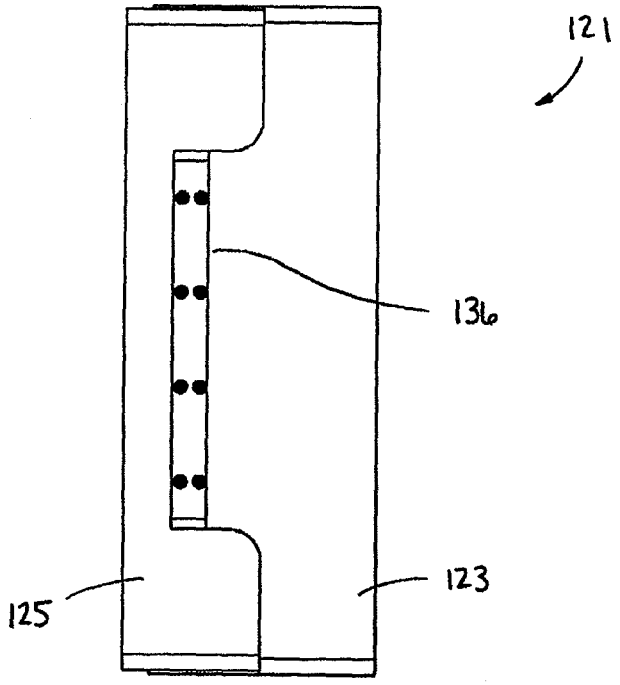


FIG. 11

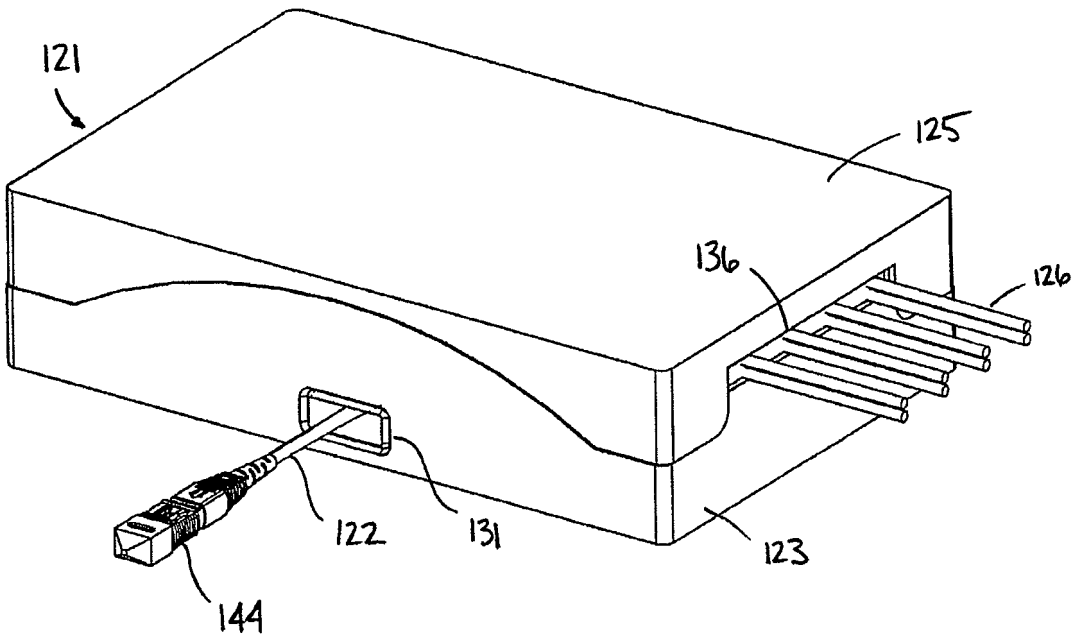


FIG. 12

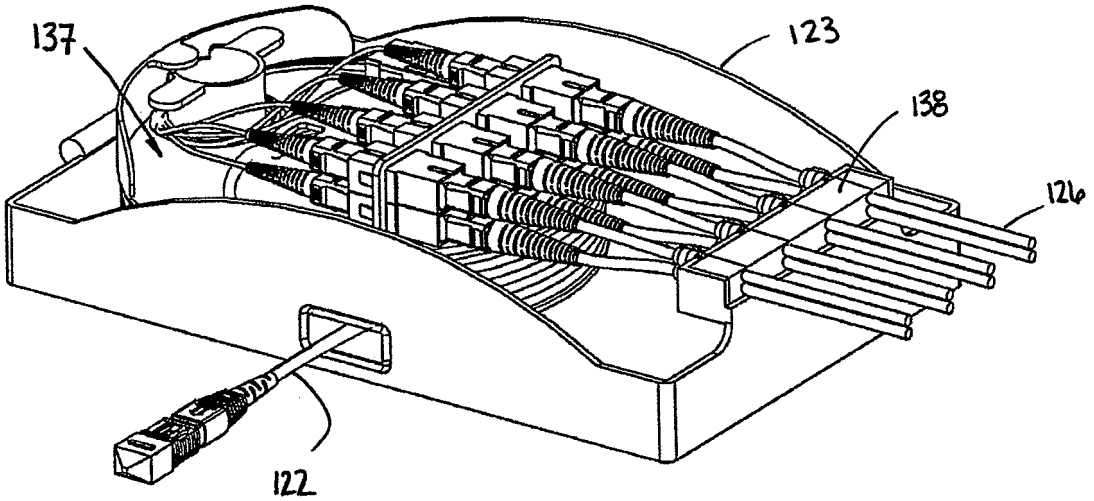


FIG. 13

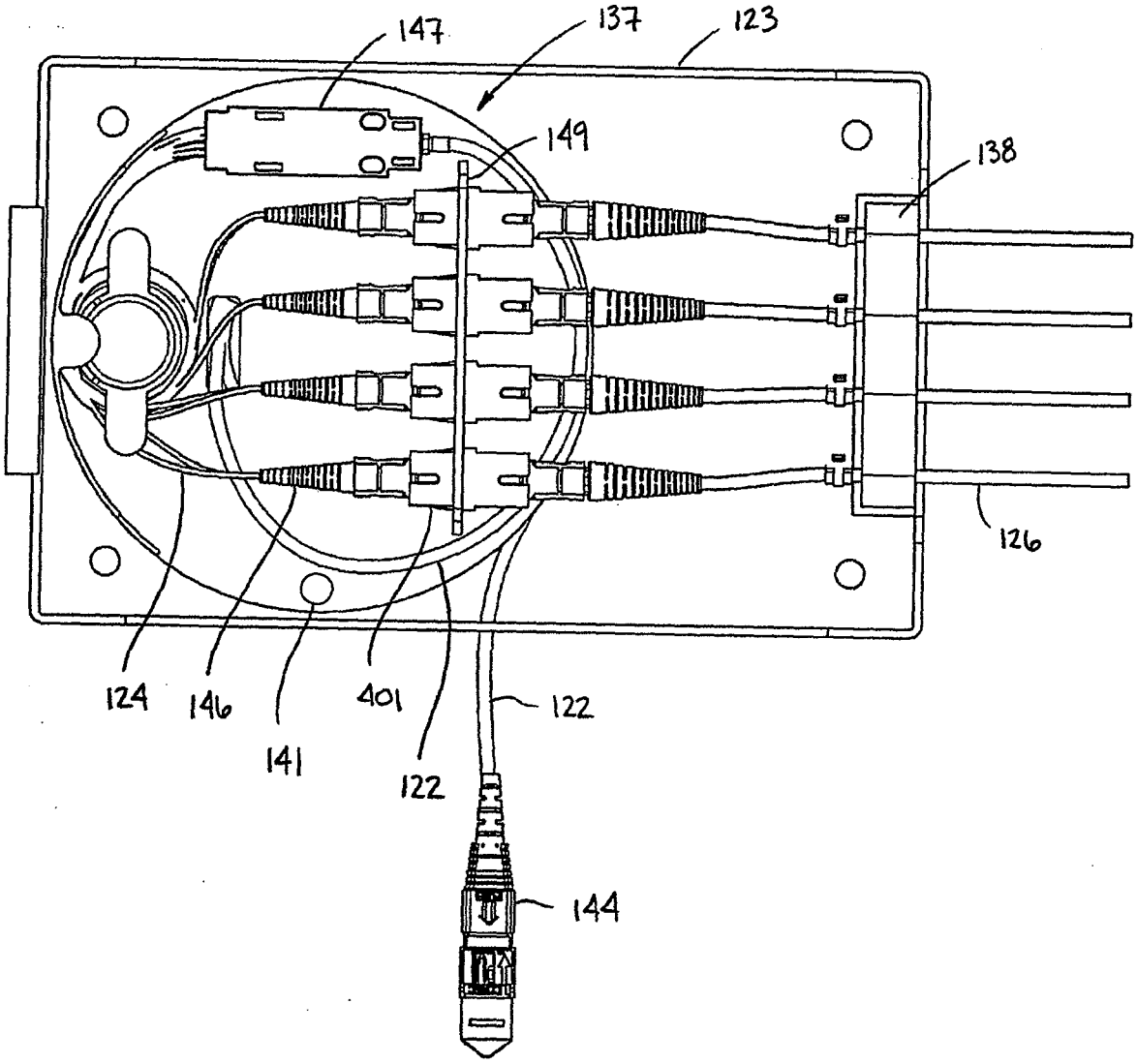


FIG. 14

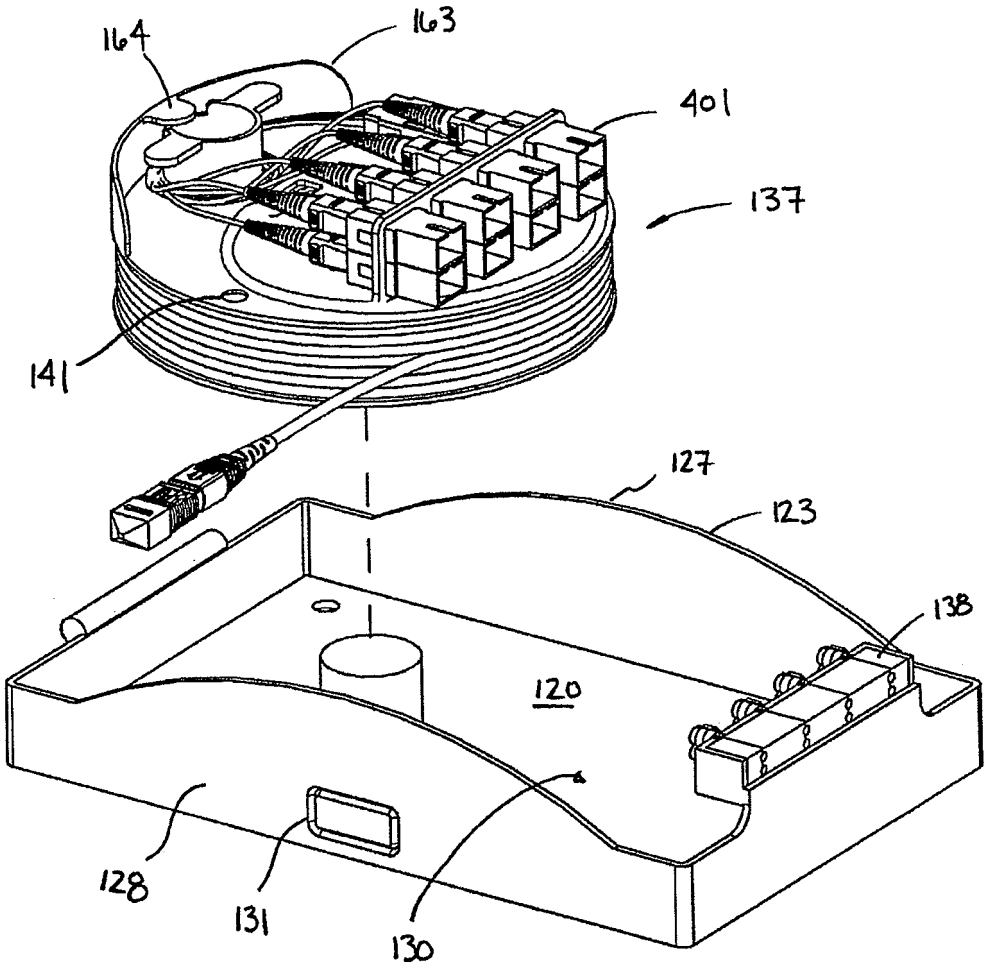


FIG. 15

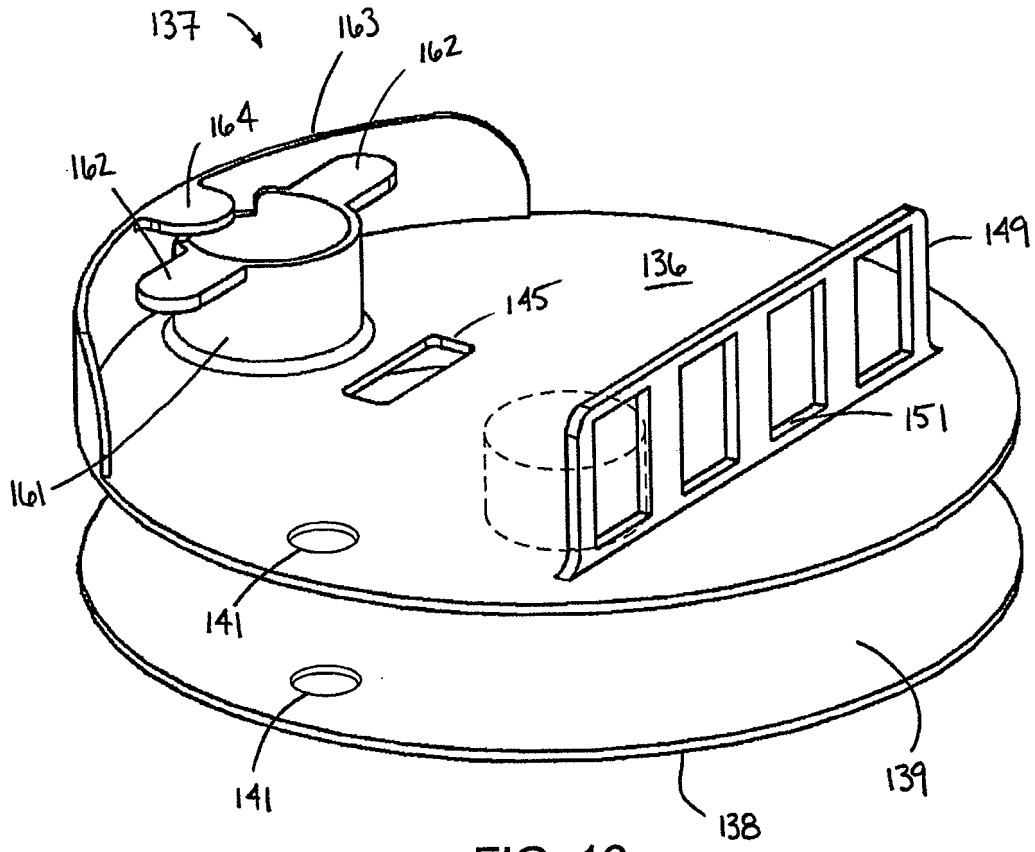


FIG. 16

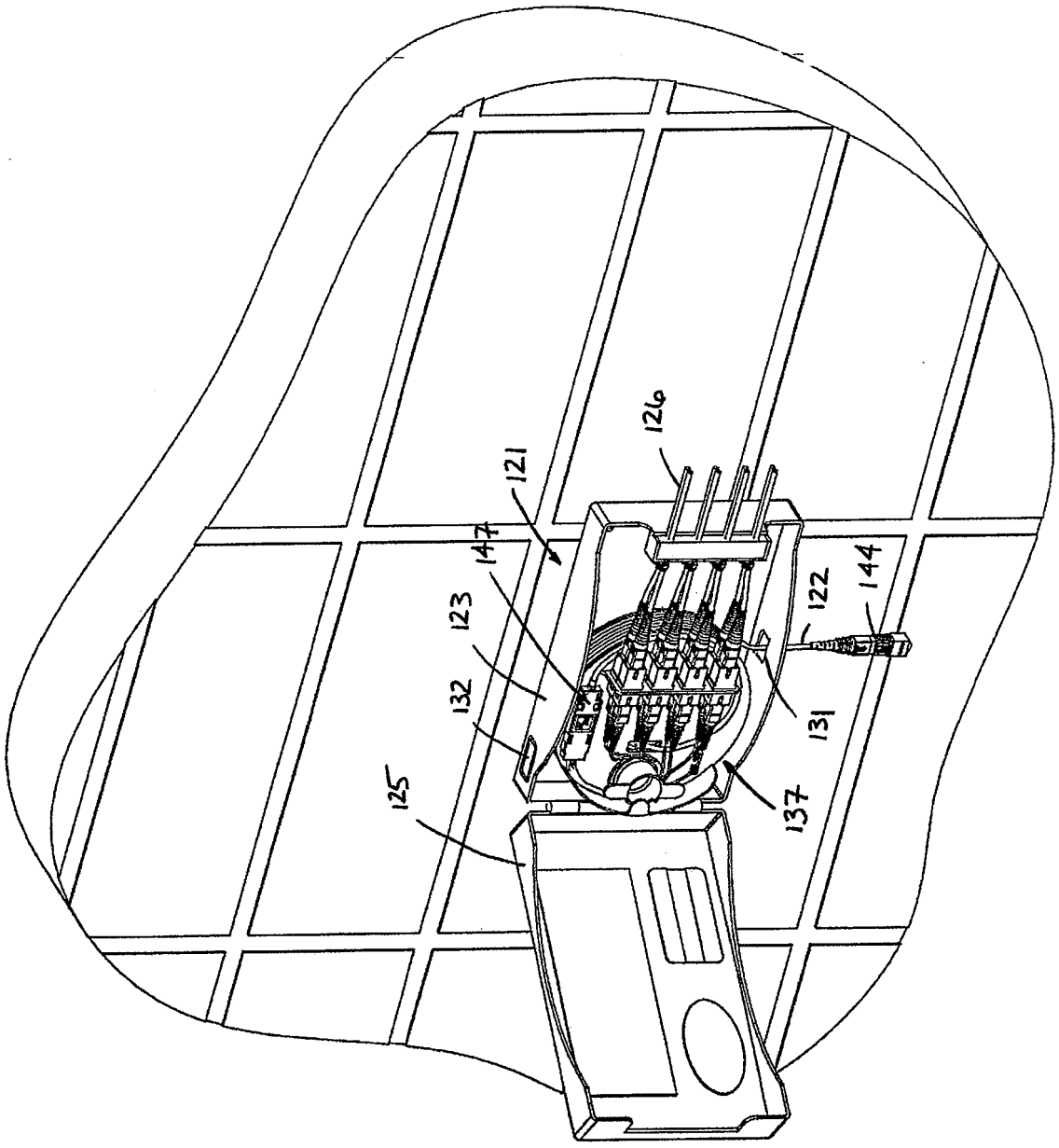


FIG. 17

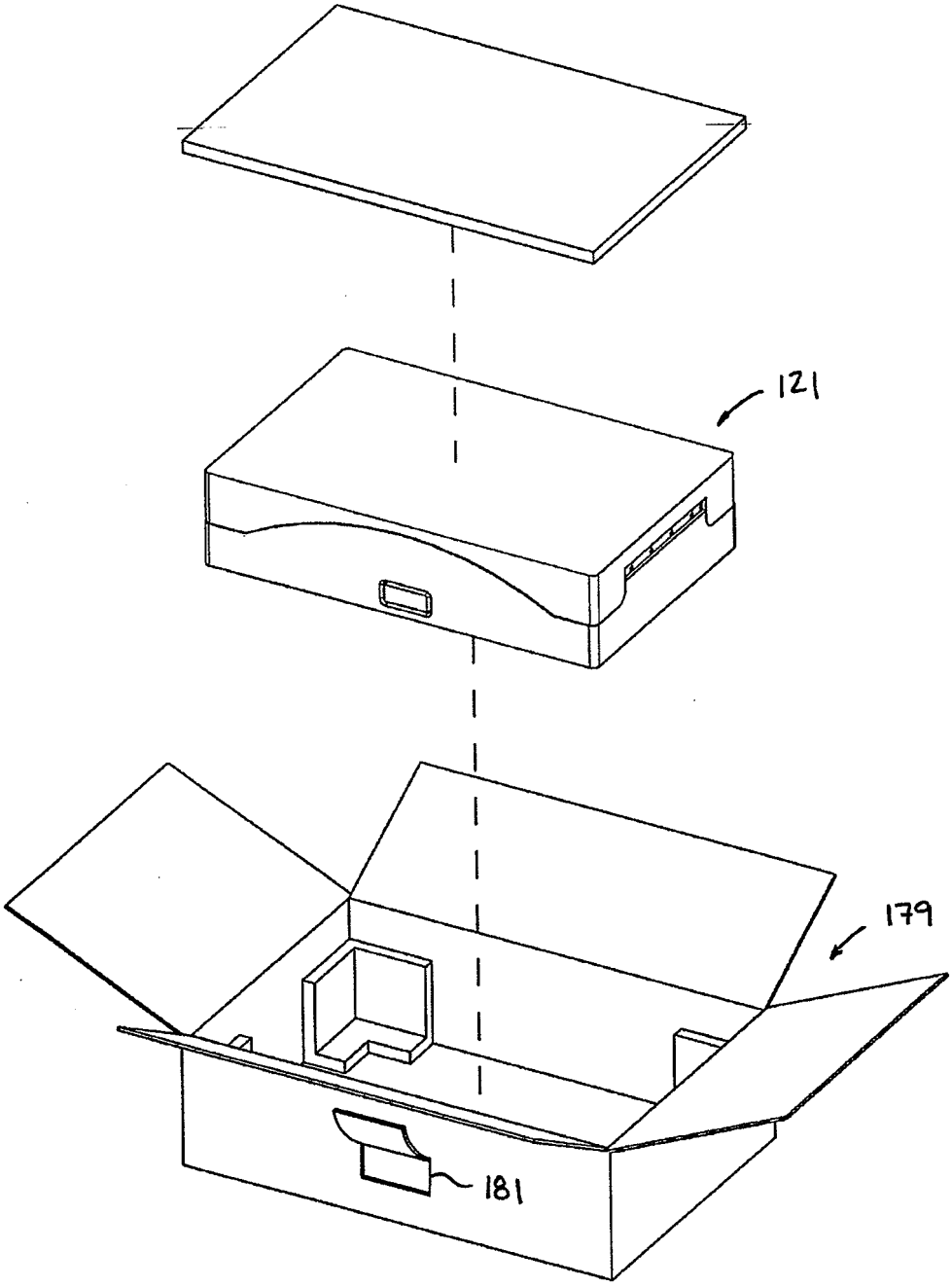


FIG. 18

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

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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

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Belden EX1010

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
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		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	

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Page 68 of 412
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Document made available under the Patent Cooperation Treaty (PCT)

International application number: PCT/US2008/072218

International filing date: 05 August 2008 (05.08.2008)

Document type: Certified copy of priority document

Document details: Country/Office: US
Number: 60/954,214
Filing date: 06 August 2007 (06.08.2007)

Date of receipt at the International Bureau: 09 February 2009 (09.02.2009)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)

142446

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

February 08, 2009

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE.

APPLICATION NUMBER: *60/954,214*
FILING DATE: *August 06, 2007*
RELATED PCT APPLICATION NUMBER: *PCT/US08/72218*

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS *US60/954,214*

Certified by

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for Intellectual Property
and Director of the United States
Patent and Trademark Office

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

DOCKET NUMBER
2316.2584USP3

Filed EFS-WEB

REQUEST FOR PROVISIONAL APPLICATION UNDER 37 C.F.R. § 1.53(c)

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

Dear Sir:

This is a request for filing a Provisional application for patent under 37 CFR § 1.53(c) entitled FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL by the following inventor(s):

Full Name Of Inventor	**Family Name** Kowalczyk	**First Given Name** Scott	**Second Given Name** C.
Residence & Citizenship	**City** Savage	**State or Foreign Country** Minnesota	**Country of Citizenship** USA
Post Office Address	**Post Office Address** 7628 Southridge Court	**City** Savage	**State & Zip Code/Country** Minnesota 55378/ USA
Full Name Of Inventor	**Family Name** Coan	**First Given Name** Jonathan	**Second Given Name** Walter
Residence & Citizenship	**City** Savage	**State or Foreign Country** Minnesota	**Country of Citizenship** USA
Post Office Address	**Post Office Address** 4441 W. 134th St.	**City** Savage	**State & Zip Code/Country** Minnesota 55378/ USA

1. ☒ Enclosed is the Provisional application for patent as follows: 7 pages of specification, and 6 sheets of drawings.

2. ☐ Small entity status is claimed pursuant to 37 CFR 1.27.

3. ☒ Payment of Provisional filing fee under 37 C.F.R. § 1.16(d):
   - ☐ Attached is a check in the amount of $.
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5. ☐ Enclosed is an Assignment of the invention to , Recordation Form Cover Sheet and a check for $ to cover the Recordation Fee.

6. ☐ Also Enclosed:

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8. ☒ Address all future communications to the **Attention of Jarett D. Millar** (may only be completed by attorney or agent of record) at the address below.

Respectfully submitted,

23552
PATENT TRADEMARK OFFICE

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Date: August 6, 2007

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DGS:JDM:jrm

Attorney Docket No. 02316.2584USP3

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.

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

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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.

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.

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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.

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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.

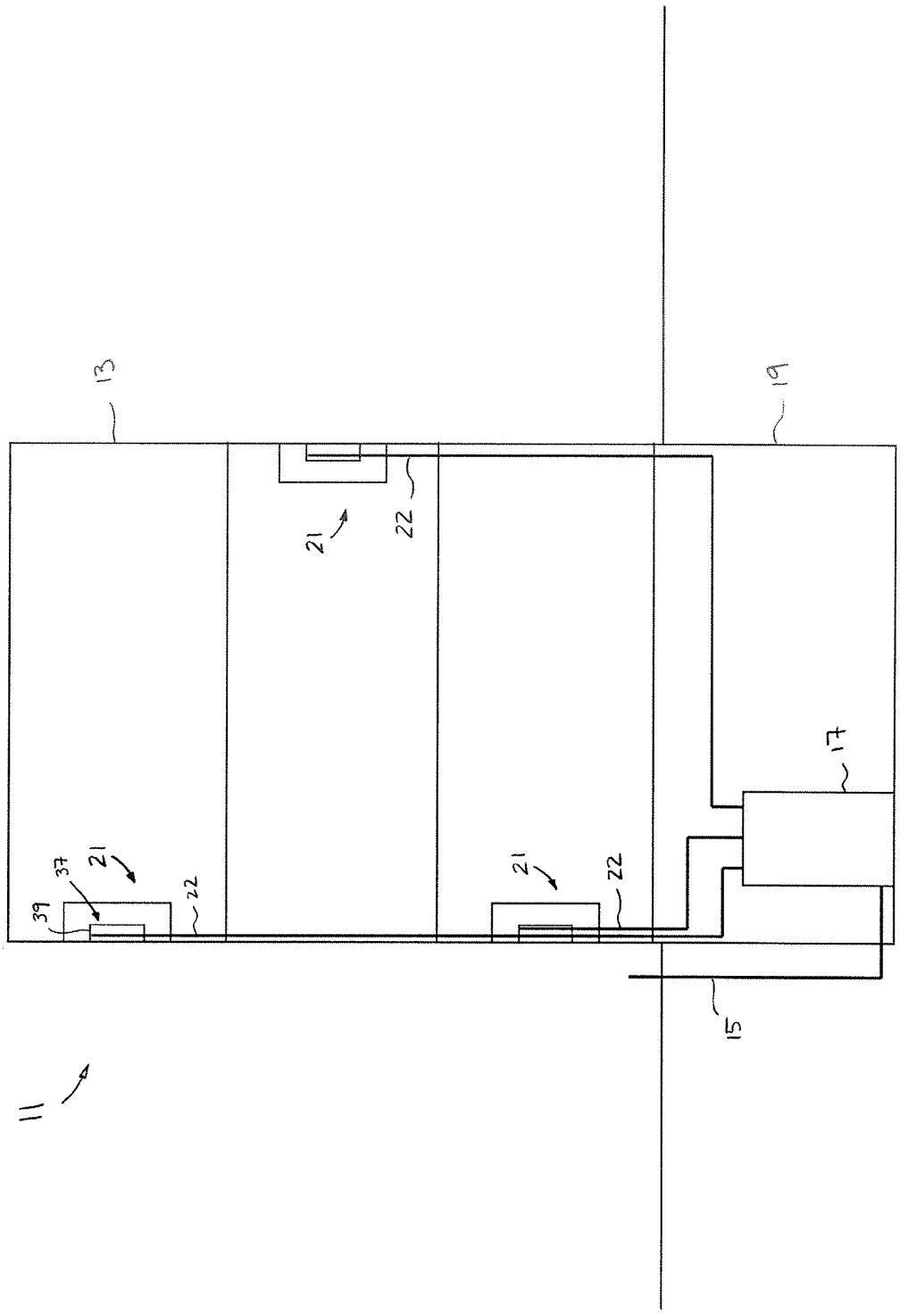


FIG. 1

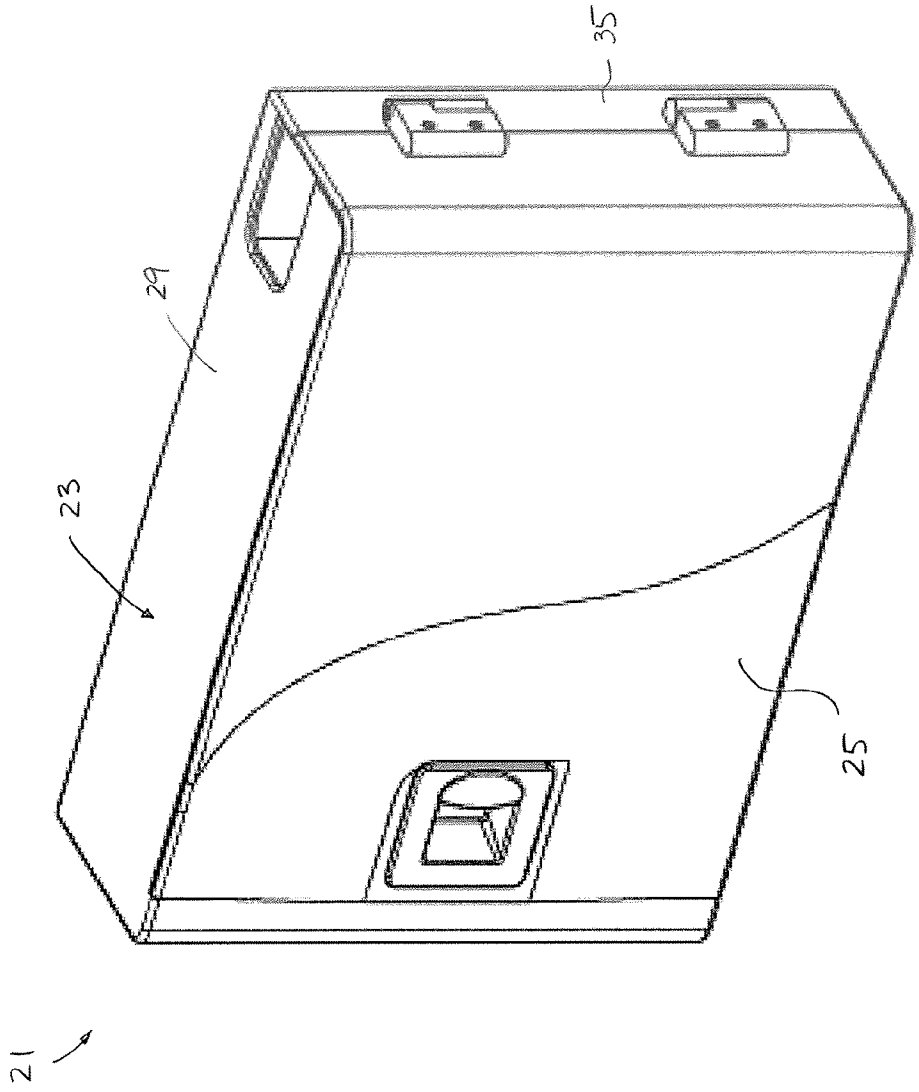


FIG. 2

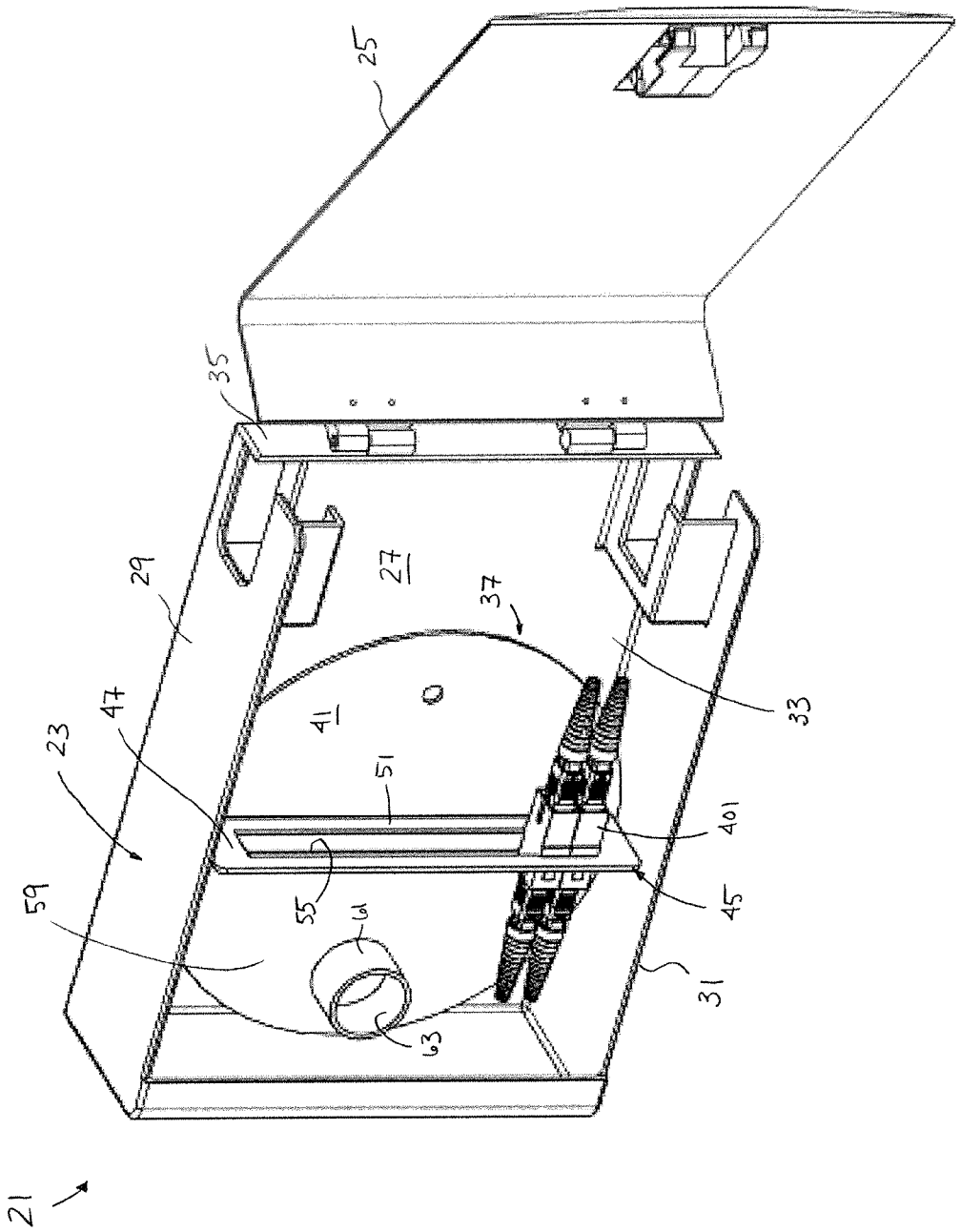


FIG. 3

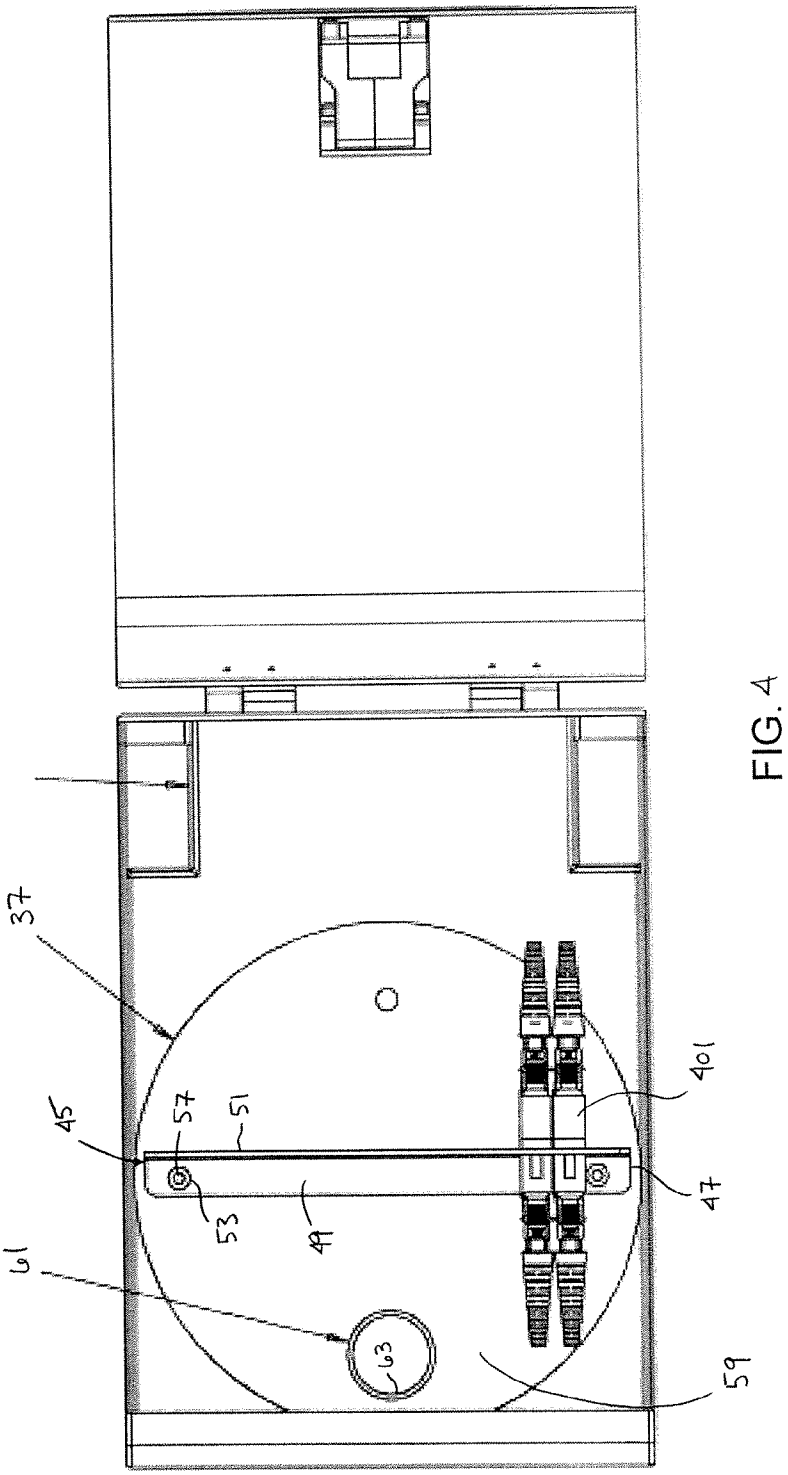


FIG. 4

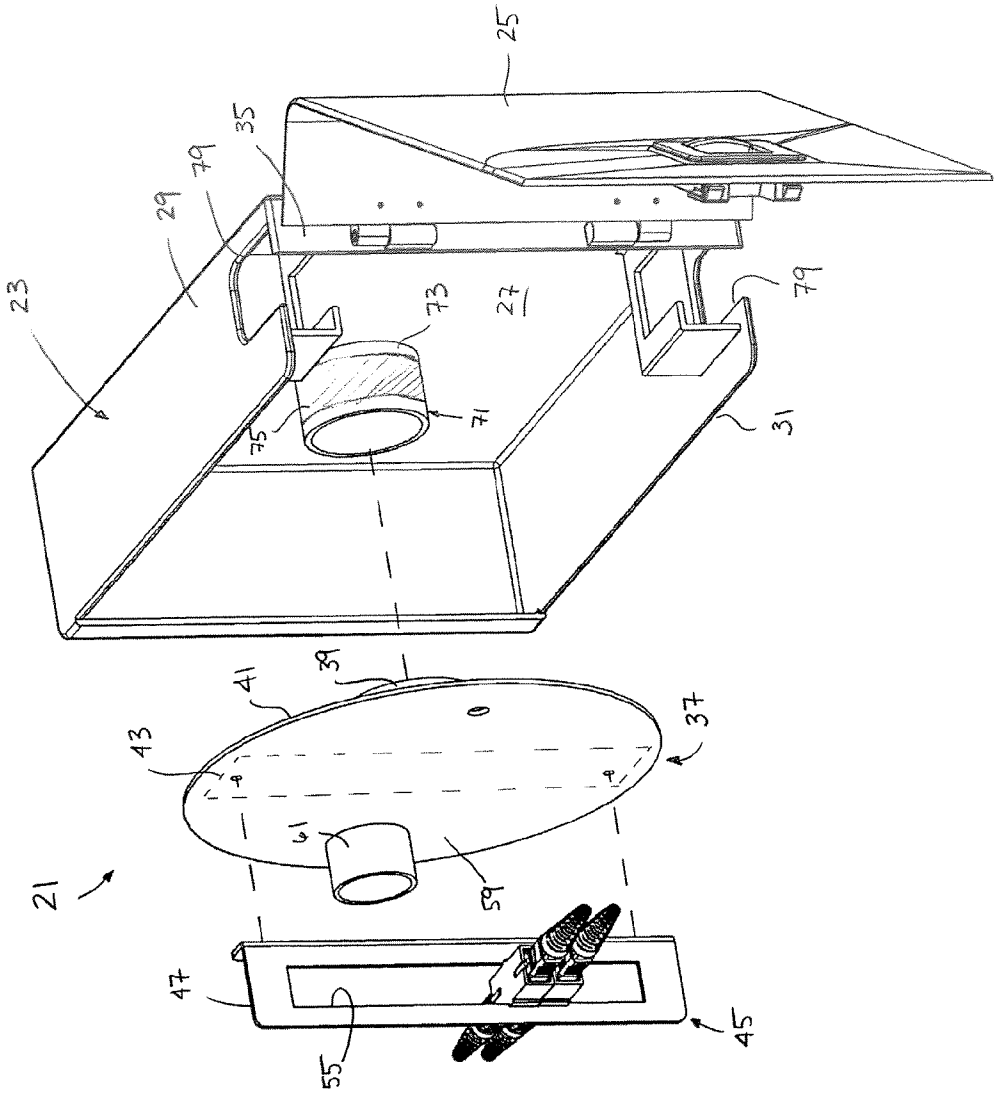


FIG. 5

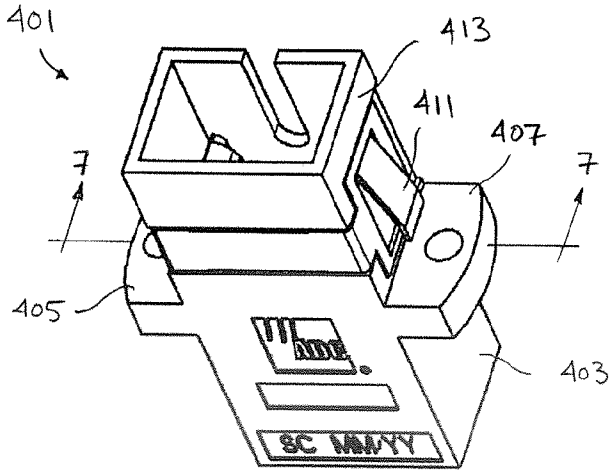


FIG. 6

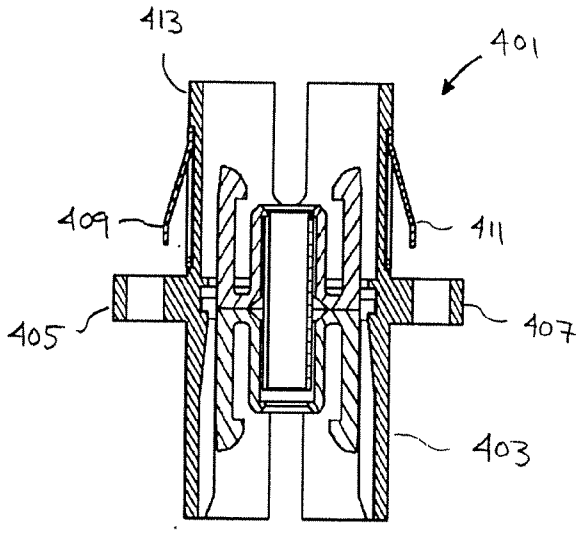


FIG. 7

Electronic Acknowledgement Receipt

EFS ID:	2052699
Application Number:	60954214
International Application Number:	
Confirmation Number:	9722
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:	02316.2584USP3
Receipt Date:	06-AUG-2007
Filing Date:	
Time Stamp:	17:28:52
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment was successfully received in RAM	$200
RAM confirmation Number	2264
Deposit Account	132725
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 1.16 and 1.17	

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_Prov_Appln.pdf	97201 38b68baf6f39e2afa0fd719f76c9ad4616ea34ae	no	2
Warnings:					
Information:					
2		Prov_Application.pdf	932797 8f3096fa6ba0cac99a40db9afe99bc7c9be40e61	yes	17

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	7
Claims	8	10
Abstract	11	11
Drawings	12	17

Warnings:					
Information:					
3	Fee Worksheet (PTO-06)	fee-info.pdf	8137 557cbd187ea01c8998ff3b77479294a008018537	no	2
Warnings:					
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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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

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Number: 61/029,248
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142445

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February 08, 2009

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APPLICATION NUMBER: *61/029,248*
FILING DATE: *February 15, 2008*
RELATED PCT APPLICATION NUMBER: *PCT/US08/72218*

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS *US61/029,248*

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Under Secretary of Commerce
for Intellectual Property
and Director of the United States
Patent and Trademark Office

Attorney Docket No. 02316.2584USP5

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.

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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.

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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.

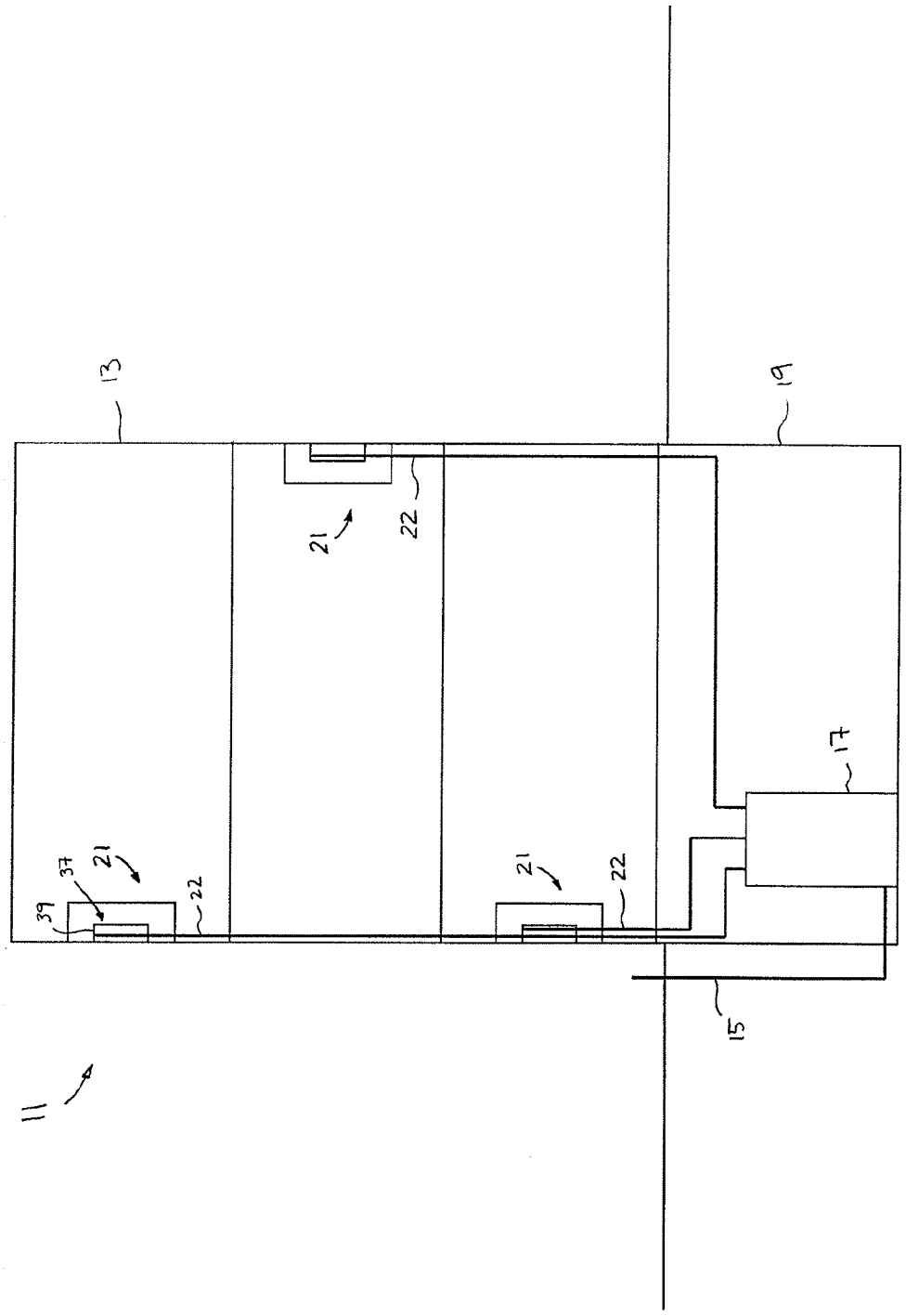


FIG. 1

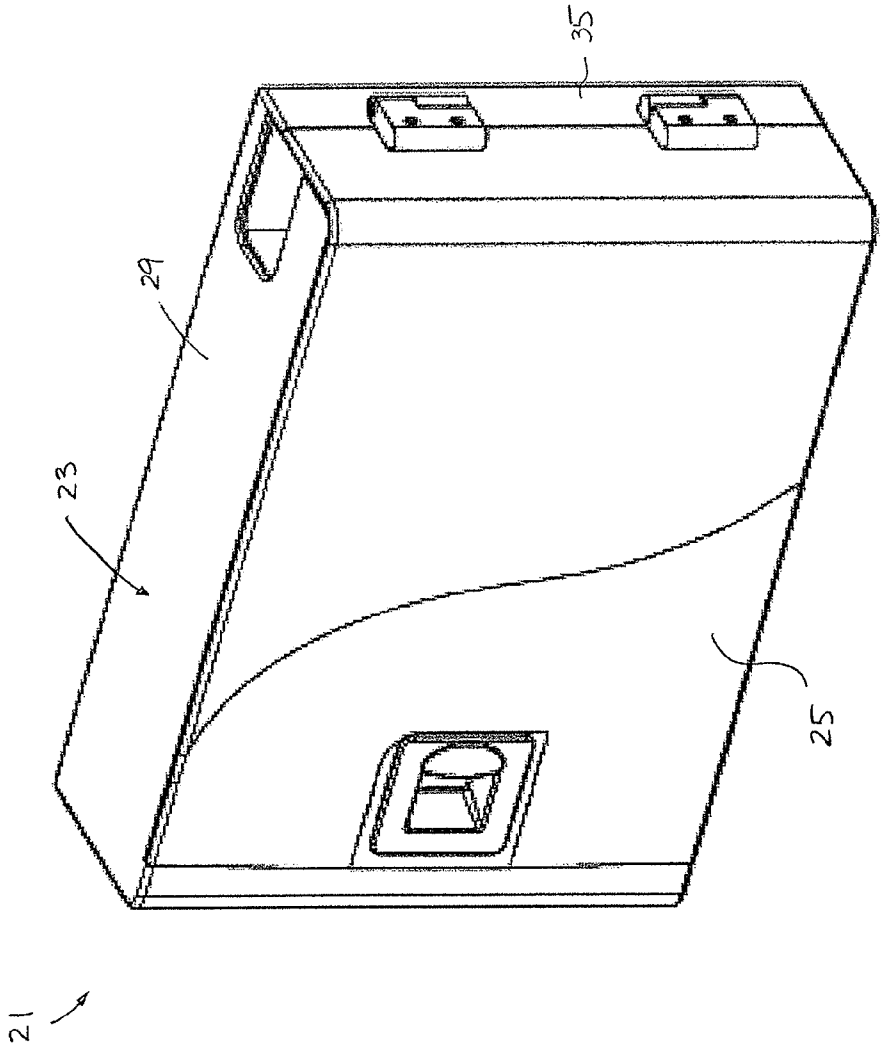


FIG. 2

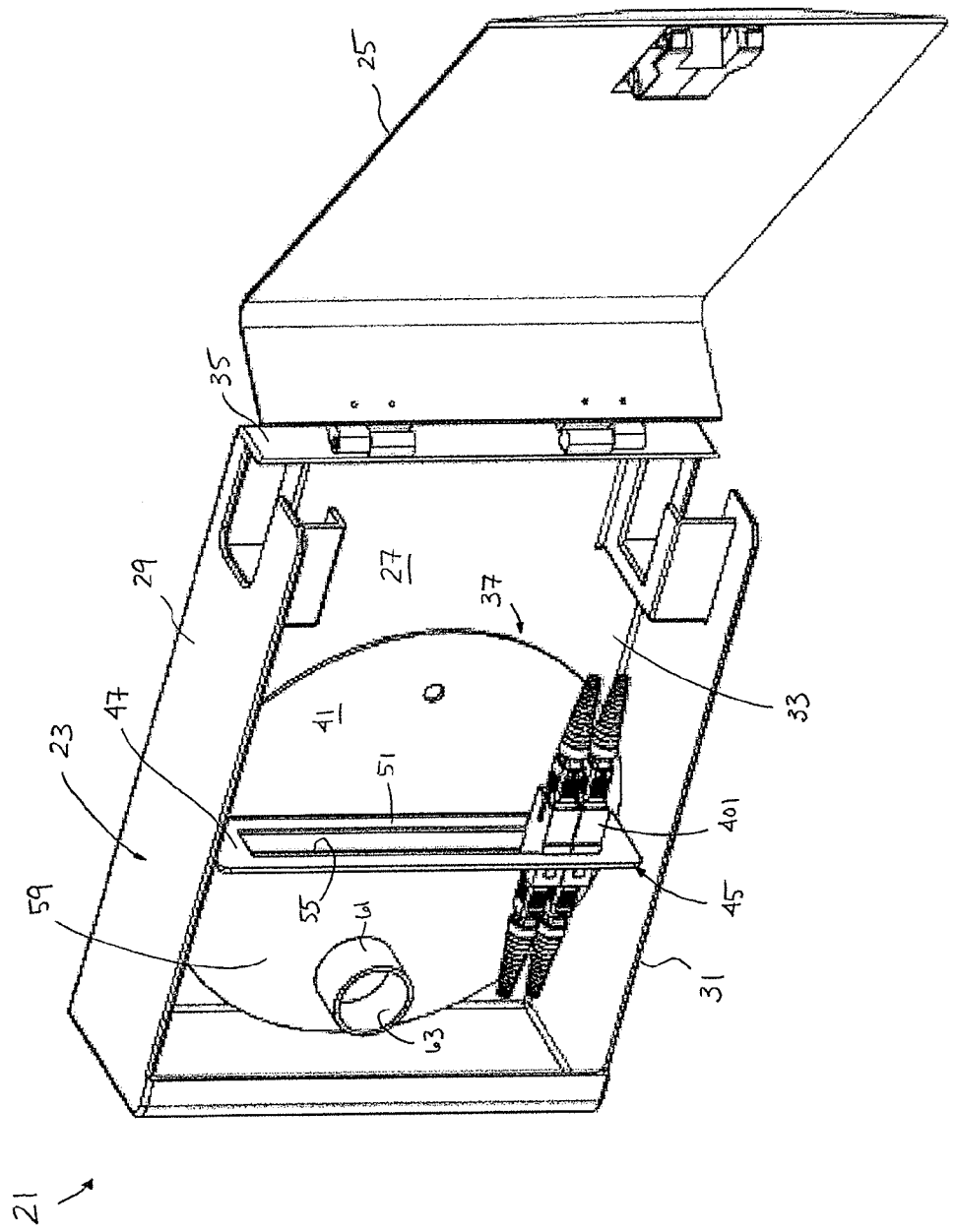


FIG. 3

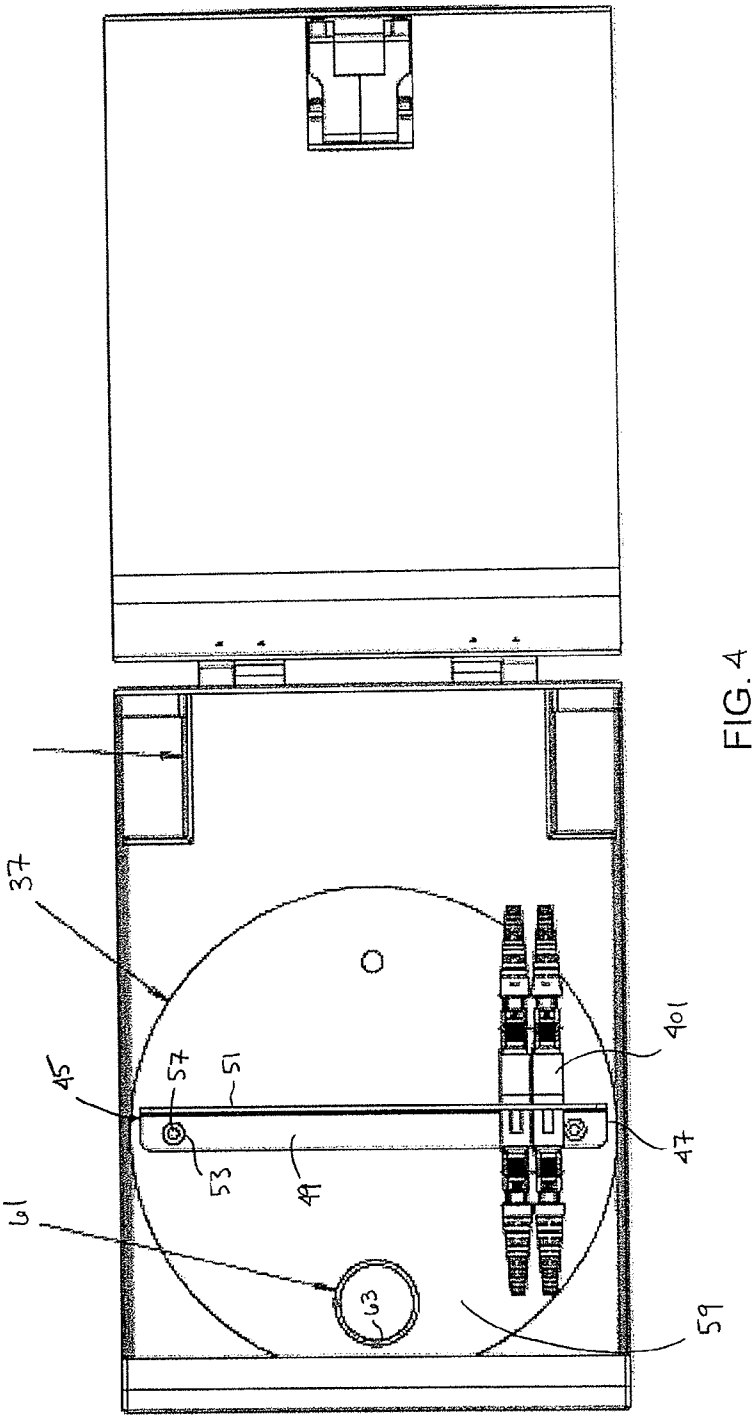


FIG. 4

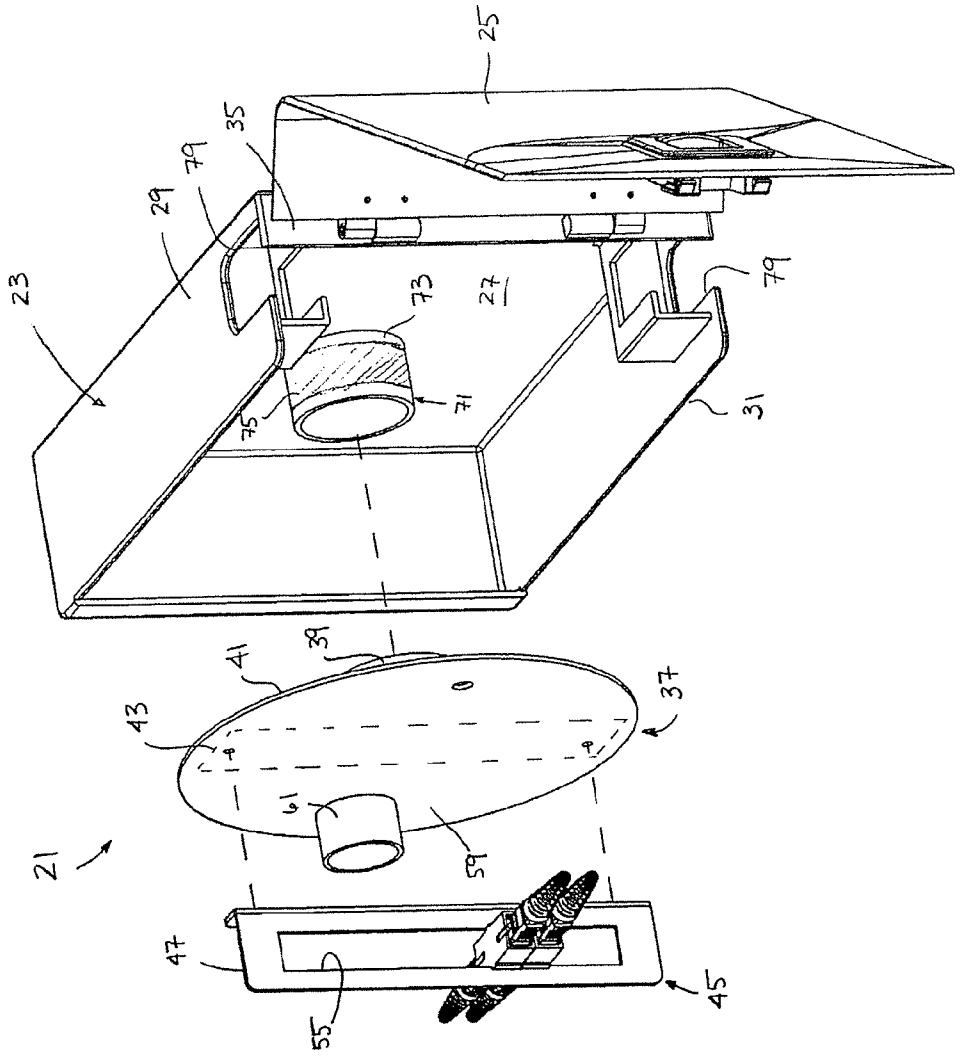


FIG. 5

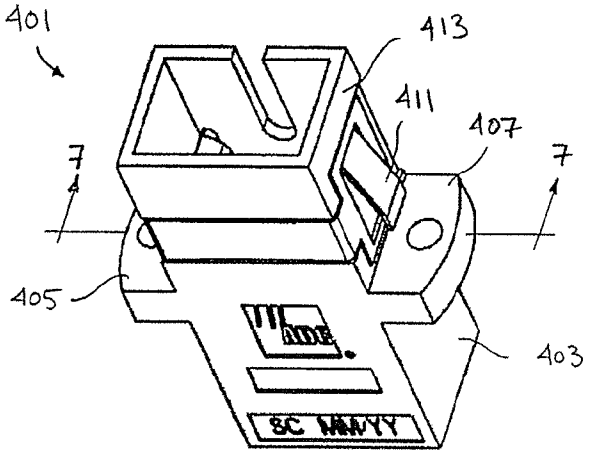


FIG. 6

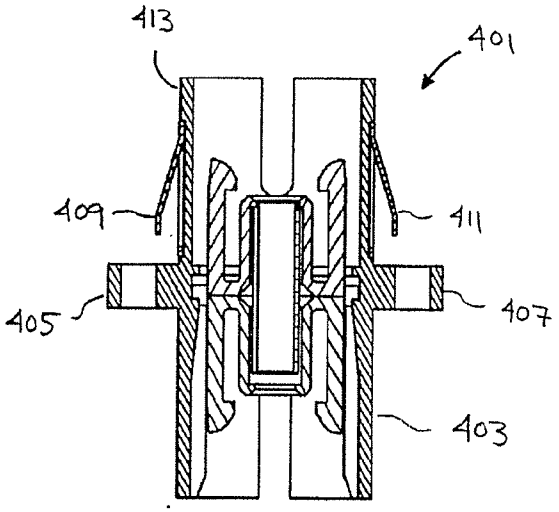


FIG. 7

REV	MCO	DWN	DATE
1	PROTO	JRK	DD-MMM-YY

FIG. 10

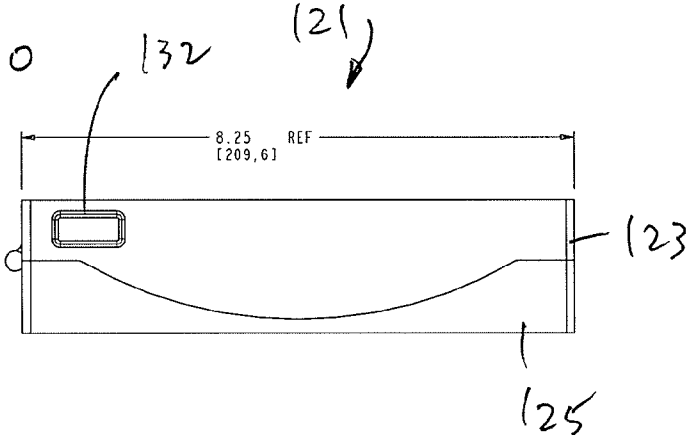


FIG. 8.

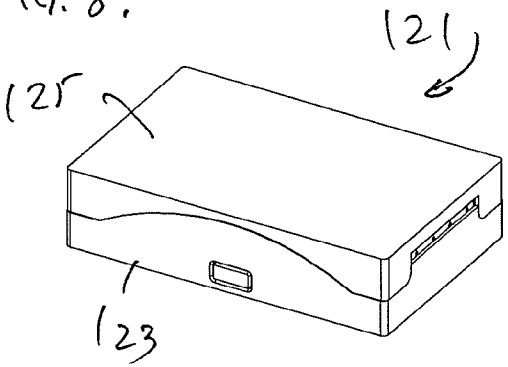


FIG. 9

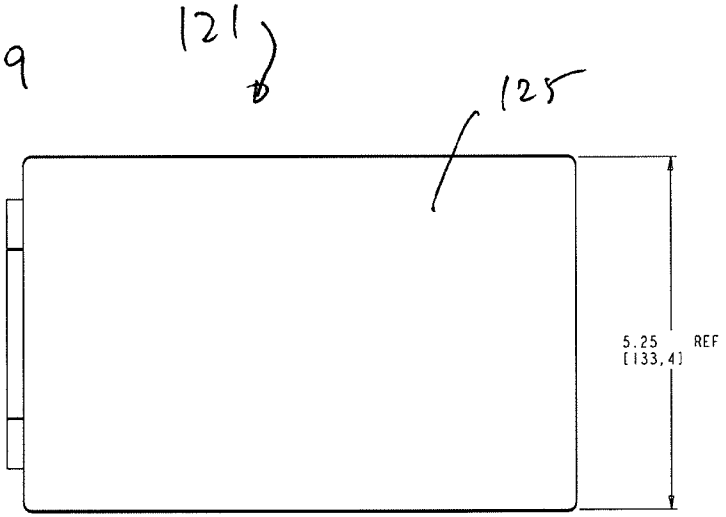
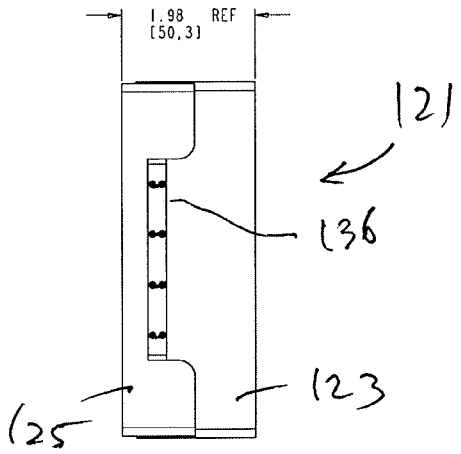


FIG. 11



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C SIZE | DRAWING NUMBER KAMLJ_INSPOOL_INSTALL | 1 REV

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ENGR: SCOTT KOWALCZYK

DWN: JONATHAN KAML

SHT. 1 OF 2

DIMENSIONS IN INCHES
THIRD ANGLE PROJECTION

REV	MCO	DWN	DATE
1	PROTO	---	DD-MMM-YY

FIG. 14

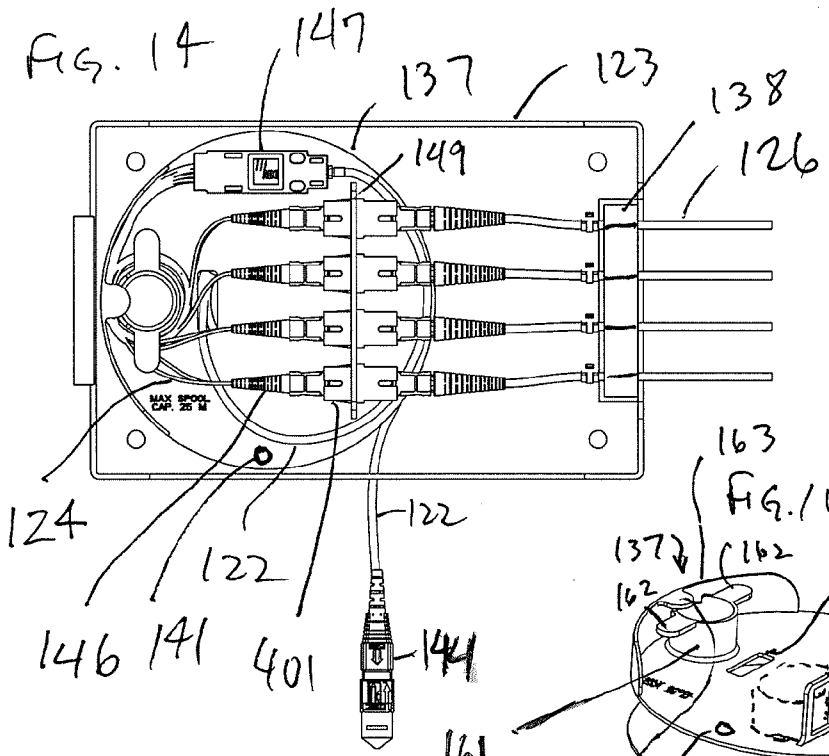


FIG. 15

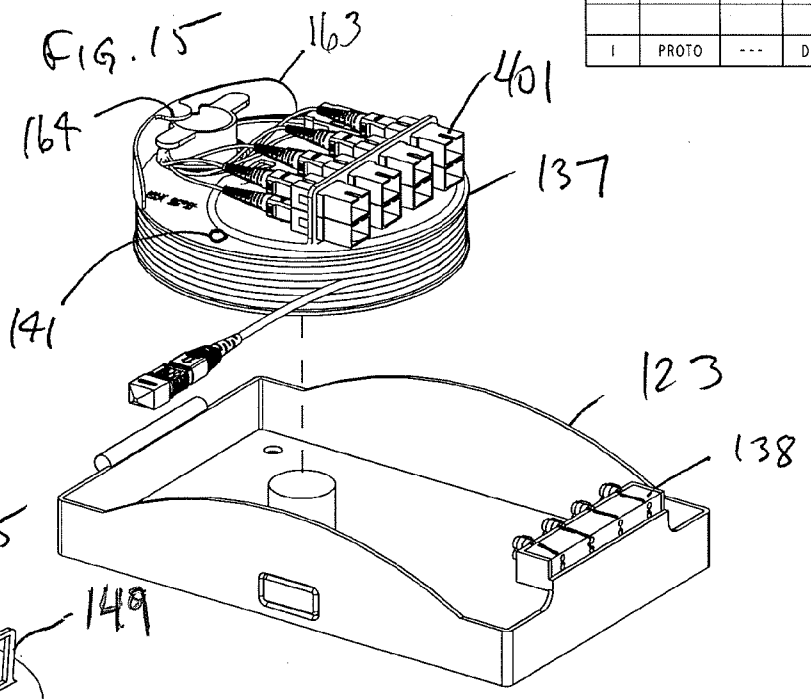


FIG. 16

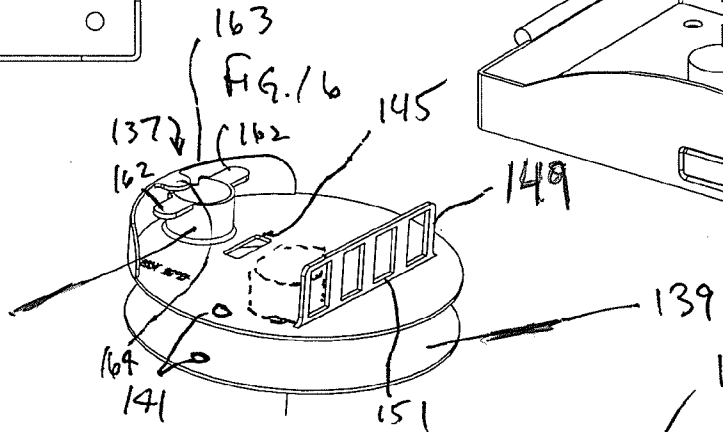


FIG. 12

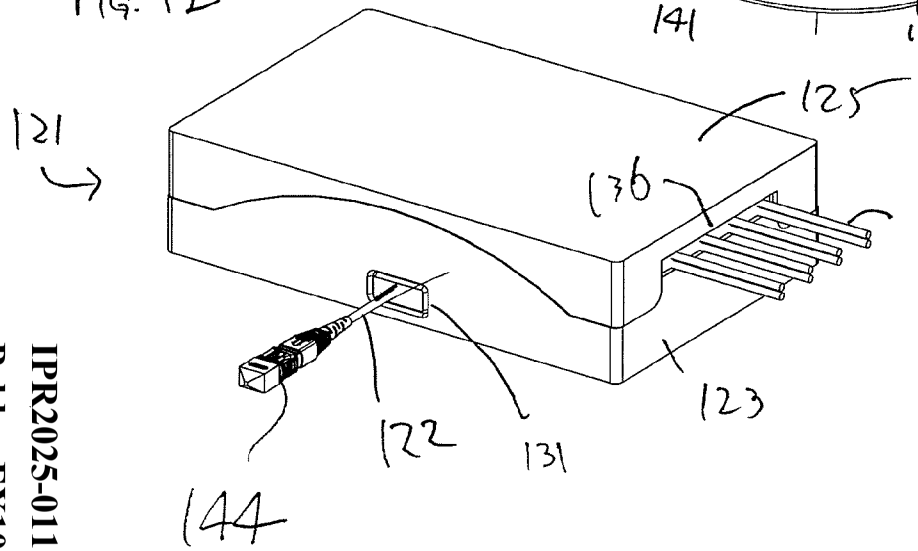
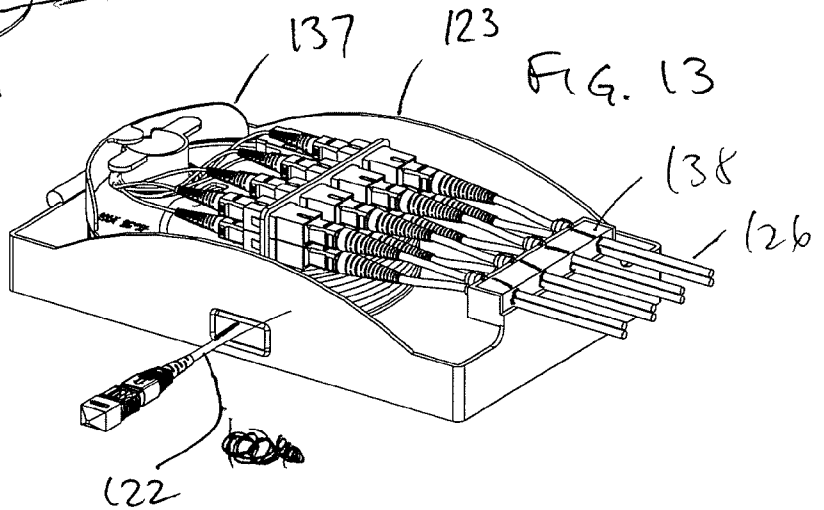


FIG. 13



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SIZE C

DRAWING NUMBER KAMLJ_PATENT

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ENGR: SCOTT KOWALCZYK

DWN: JONATHAN KAML

SHT. 1 OF 1

DIMENSIONS IN INCHES
THIRD ANGLE PROJECTION

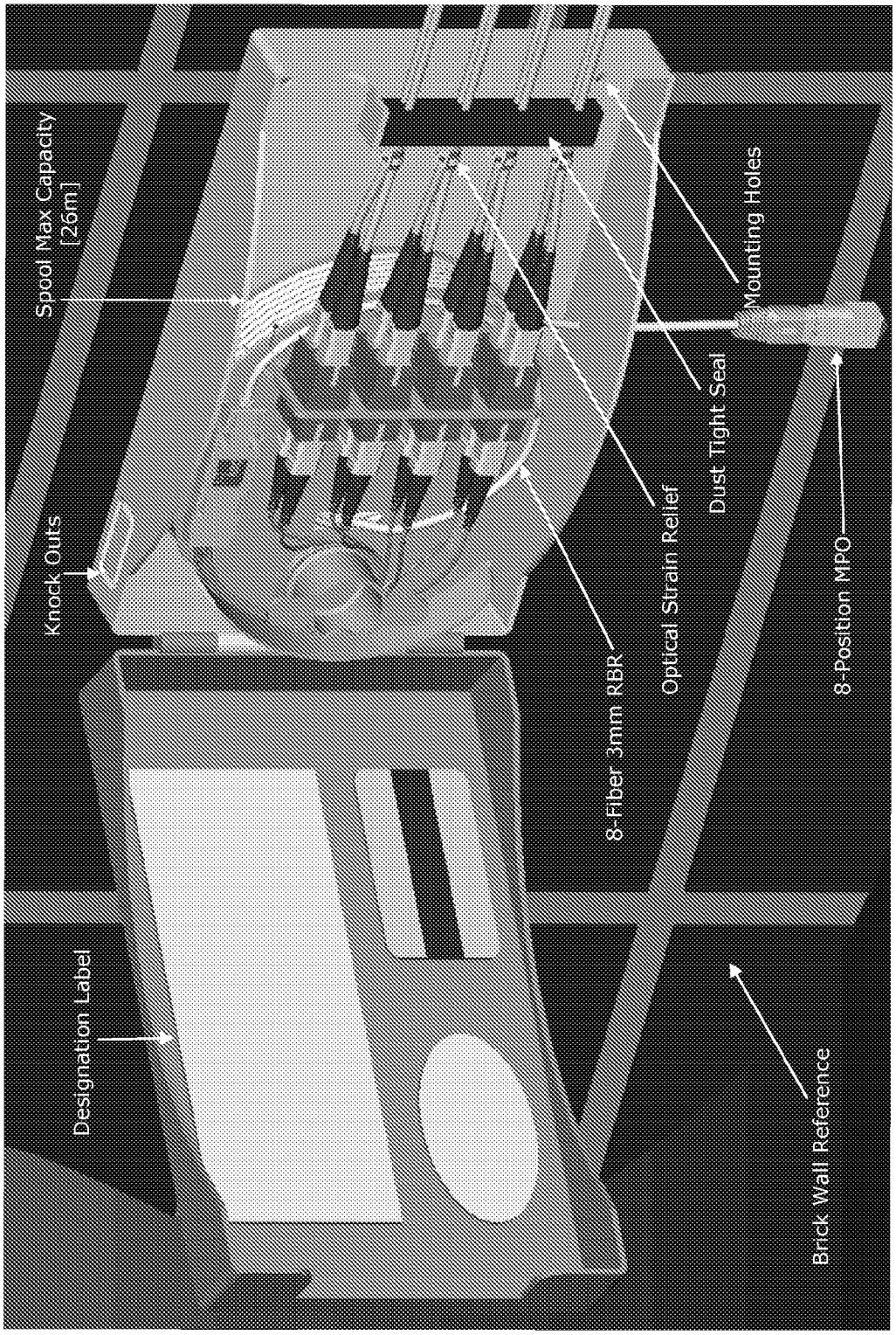

Spool Max Capacity [26m]
Knock Outs
Designation Label
Brick Wall Reference
8-Fiber 3mm RBR
Optical Strain Relief
Dust Tight Seal
Mounting Holes
8-Position MPO

FIG. 17

Electronic 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.)

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1	Provisional Cover Sheet (SB16)	Cover_Sheet.pdf	730035 88573583d653e152250a397df25eb03c5e8262ad	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
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Information:					
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5	Fee Worksheet (PTO-06)	fee-info.pdf	8130 5f60b5176456ba2786985c55adec6d8e239b49c7	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	4048683		

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.

Document made available under the Patent Cooperation Treaty (PCT)

International application number: PCT/US2008/072218

International filing date: 05 August 2008 (05.08.2008)

Document type: Certified copy of priority document

Document details: Country/Office: US
Number: 12/182,705
Filing date: 30 July 2008 (30.07.2008)

Date of receipt at the International Bureau: 09 February 2009 (09.02.2009)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)

World Intellectual Property Organization (WIPO) - Geneva, Switzerland
Organisation Mondiale de la Propriété Intellectuelle (OMPI) - Genève, Suisse

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142444

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

February 08, 2009

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE.

APPLICATION NUMBER: *12/182,705*
FILING DATE: *July 30, 2008*
RELATED PCT APPLICATION NUMBER: *PCT/US08/72218*

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS *US12/182,705*

Certified by

Under Secretary of Commerce
for Intellectual Property
and Director of the United States
Patent and Trademark Office

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.

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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.

IPR2025-01119
Belden EX1010

Attorney Docket No. 02316.2584USU2

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.

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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.

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.

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

23552
PATENT TRADEMARK OFFICE

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.

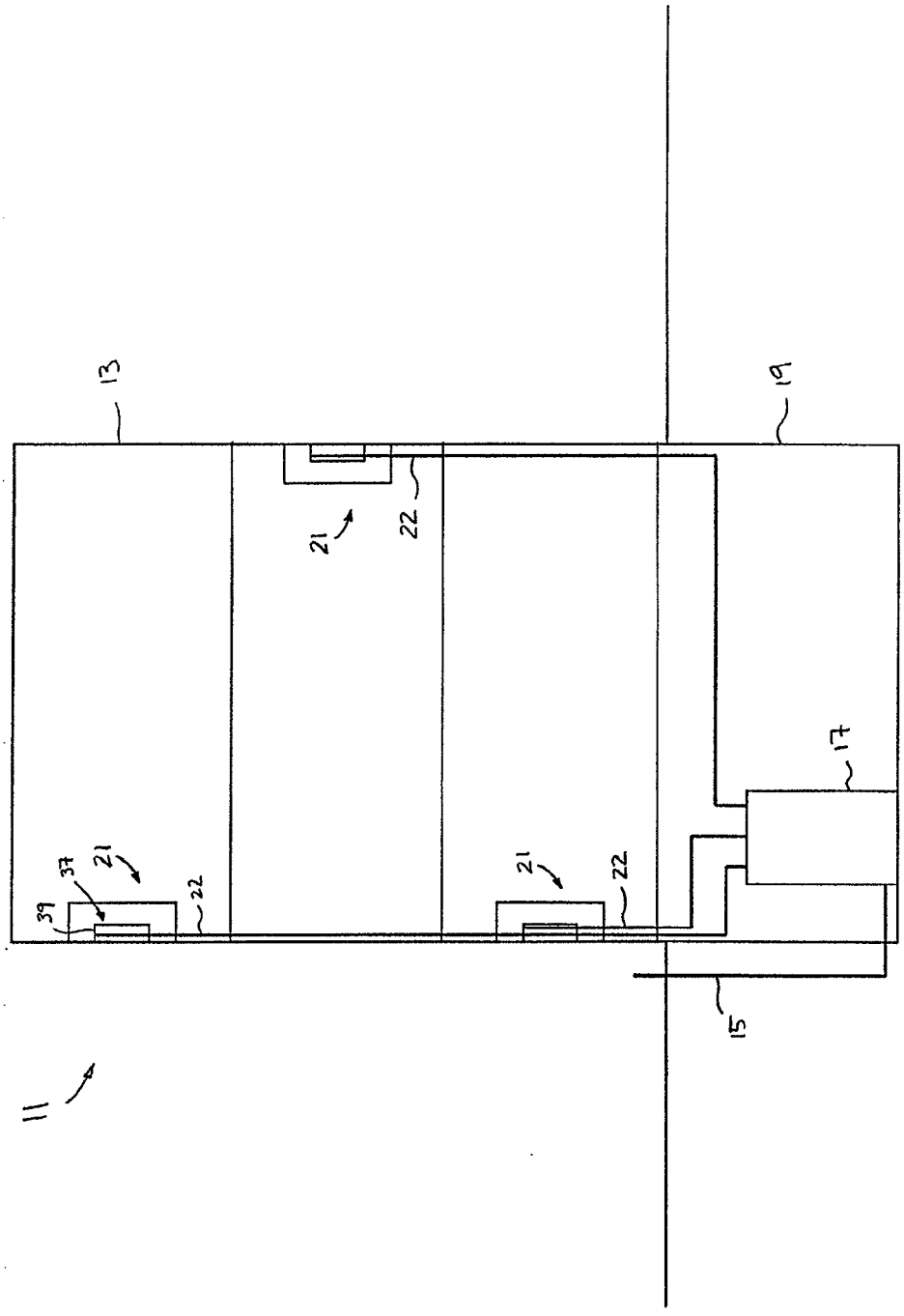


FIG. 1

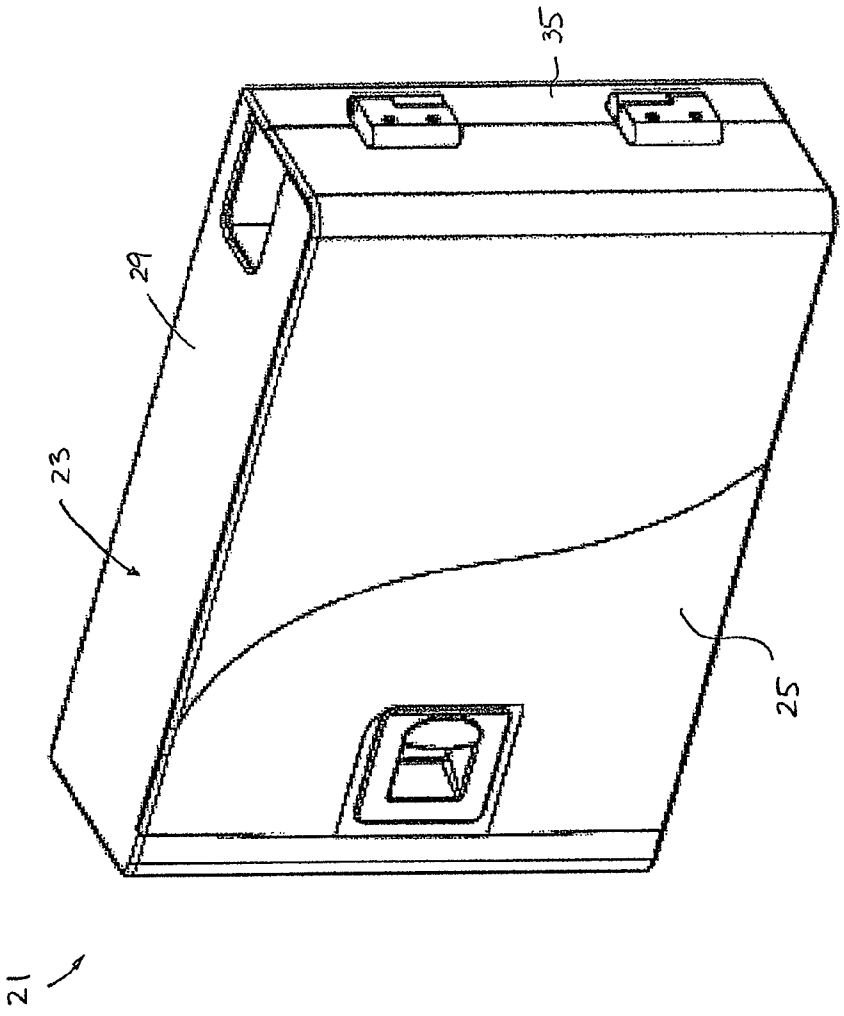


FIG. 2

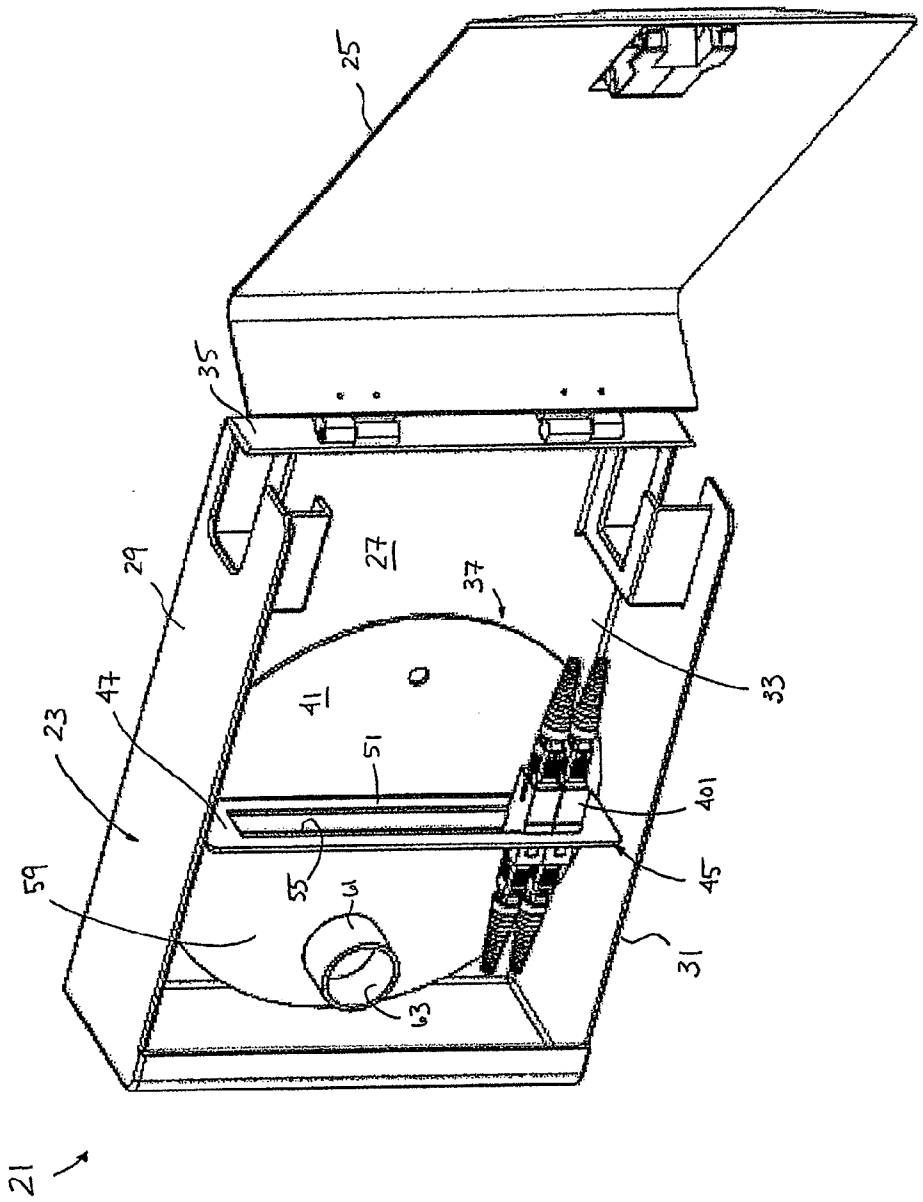


FIG. 3

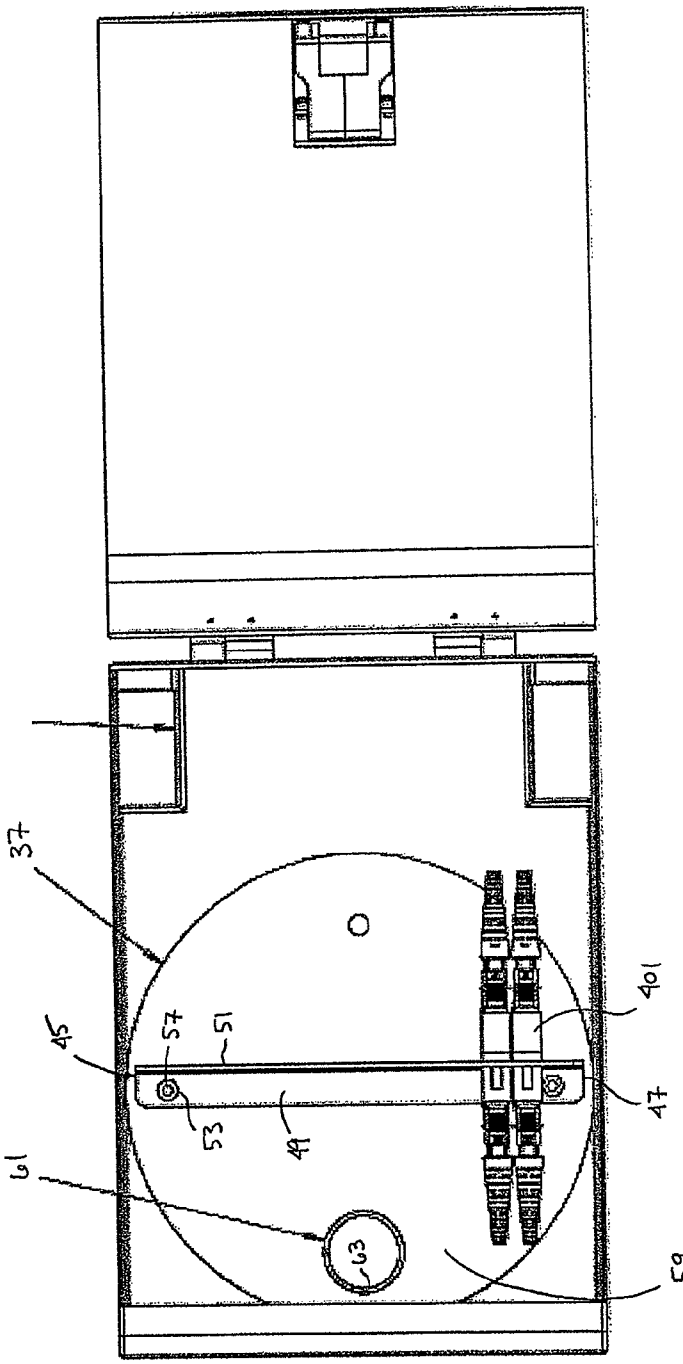


FIG. 4

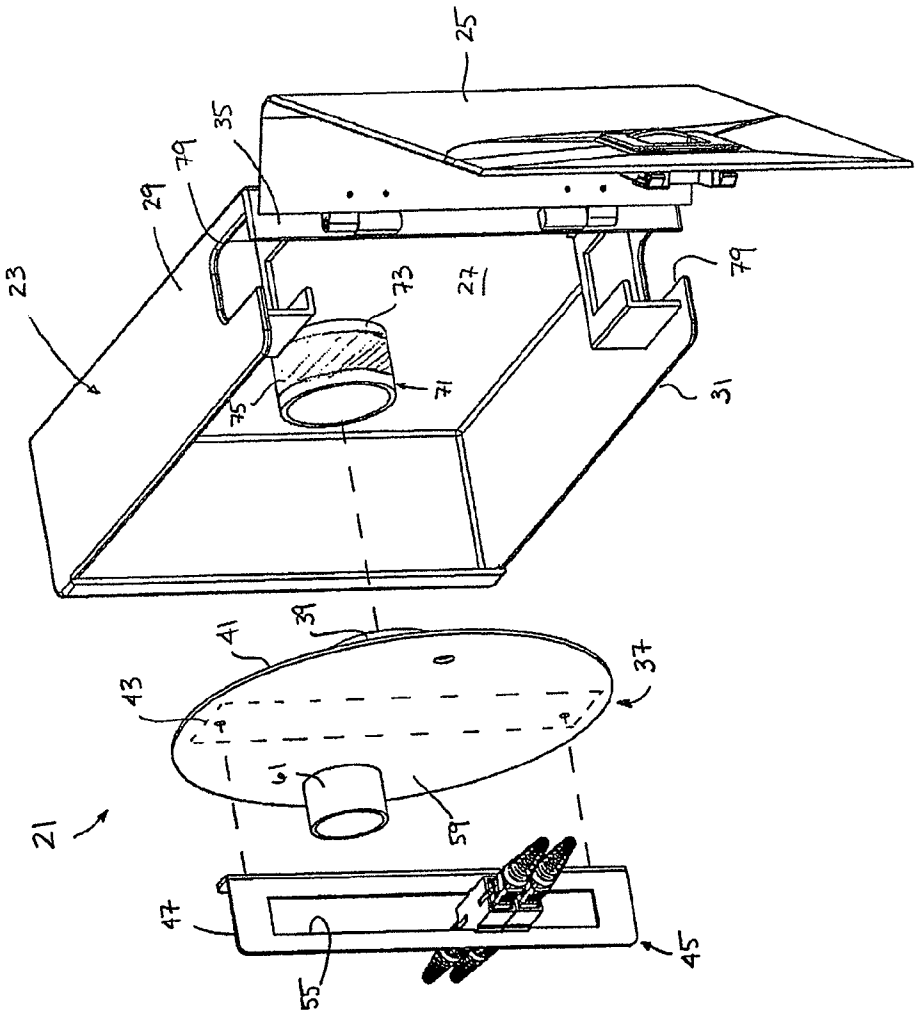


FIG. 5

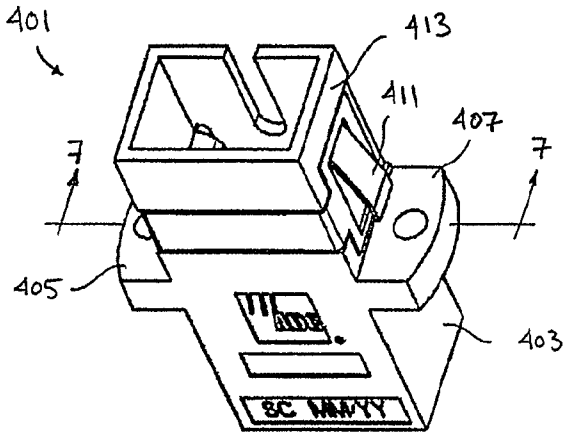


FIG. 6

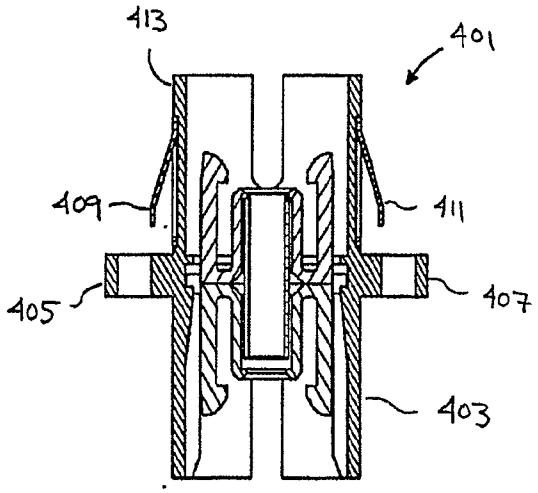


FIG. 7

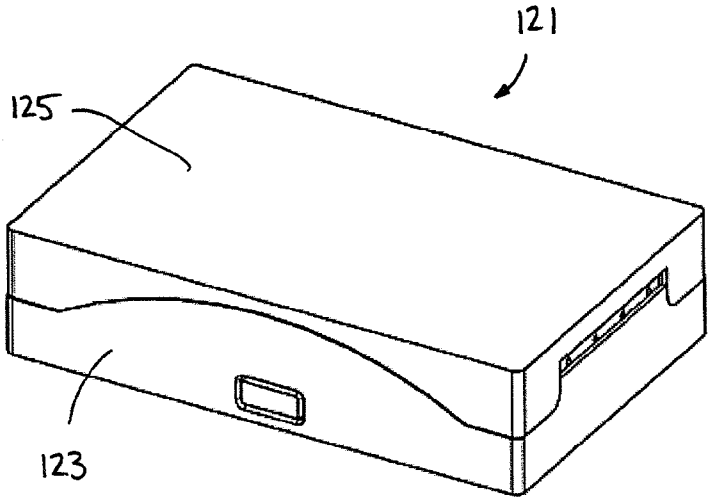


FIG. 8

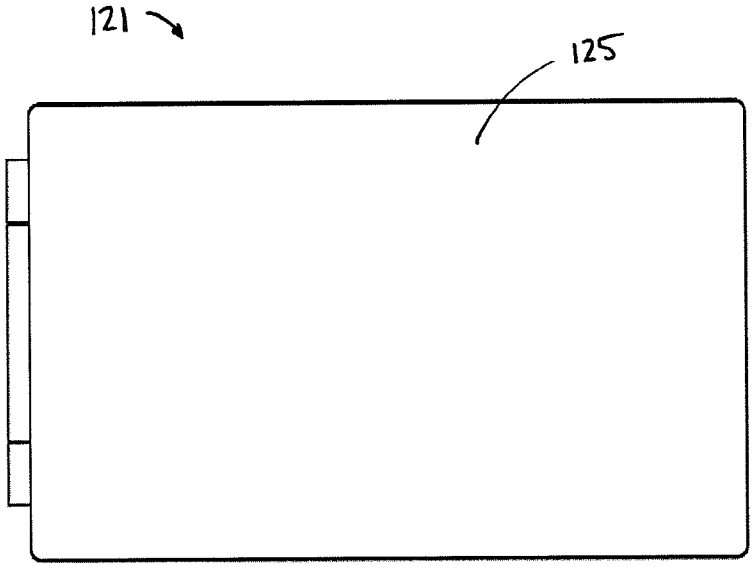


FIG. 9

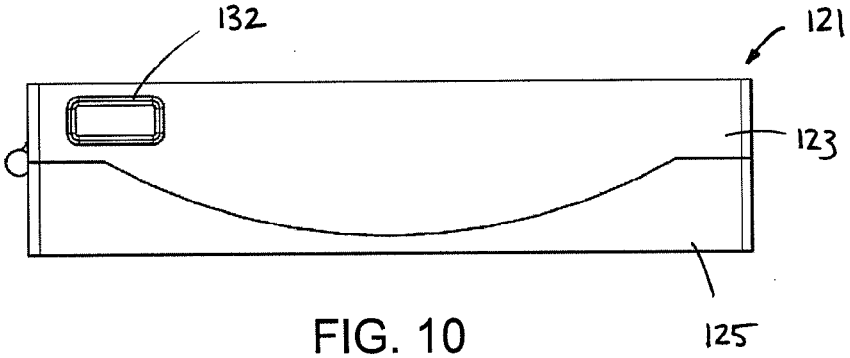


FIG. 10

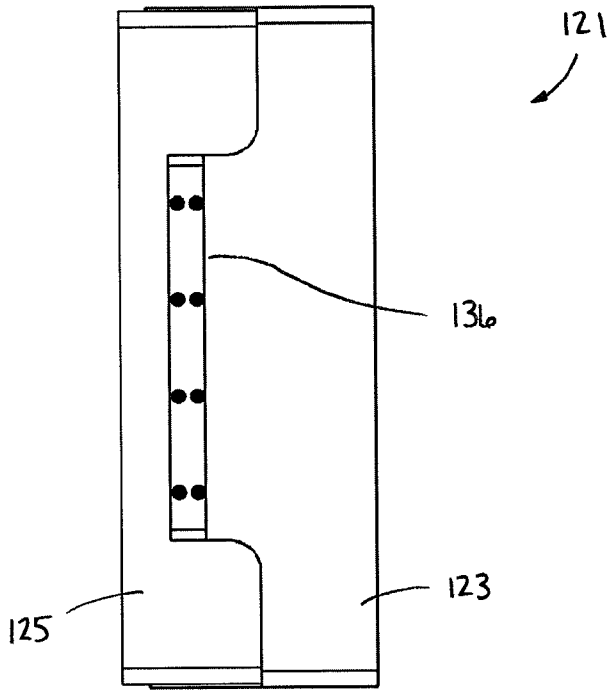


FIG. 11

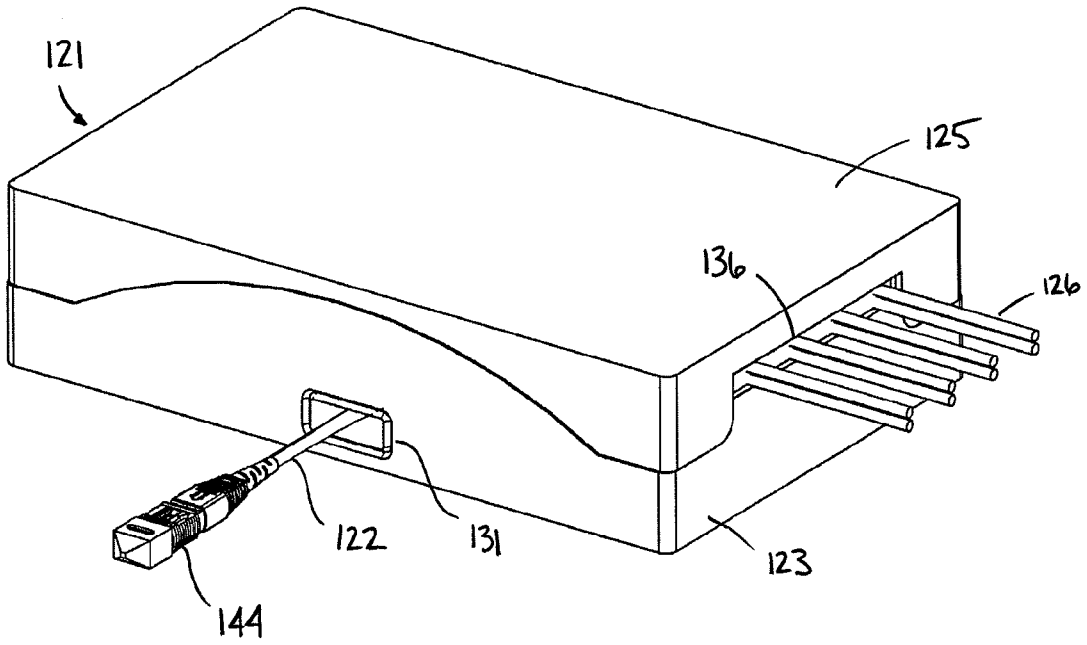


FIG. 12

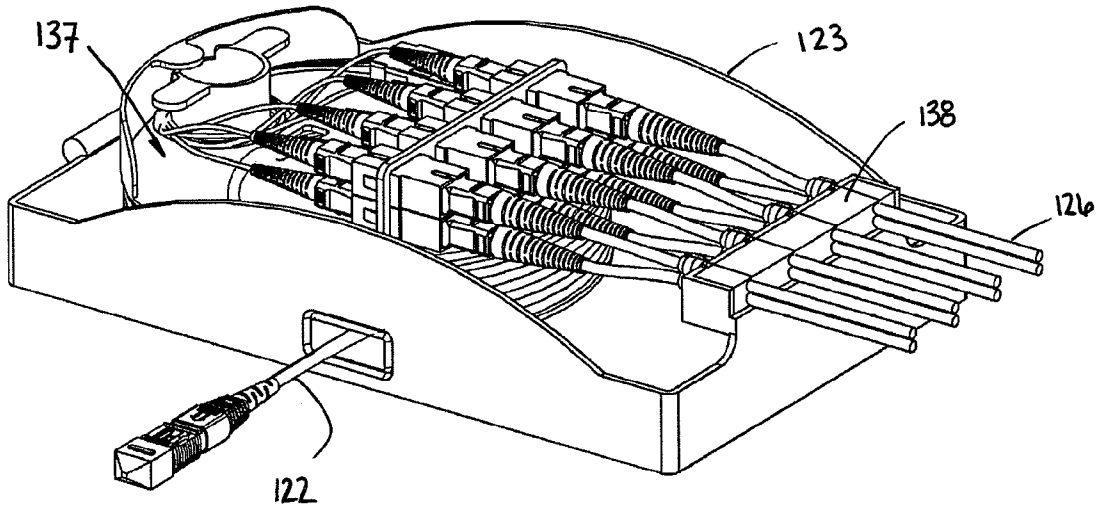


FIG. 13

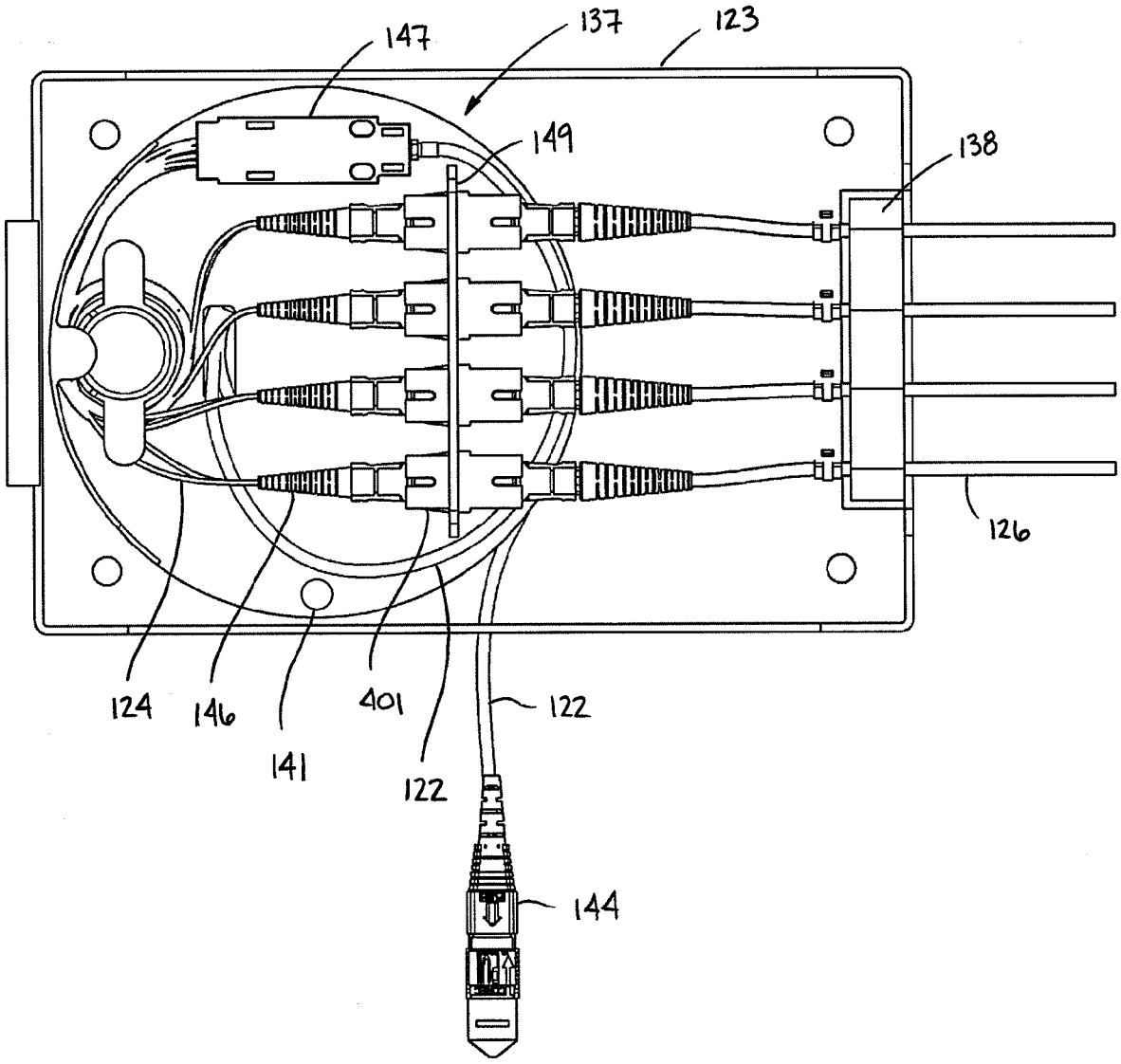


FIG. 14

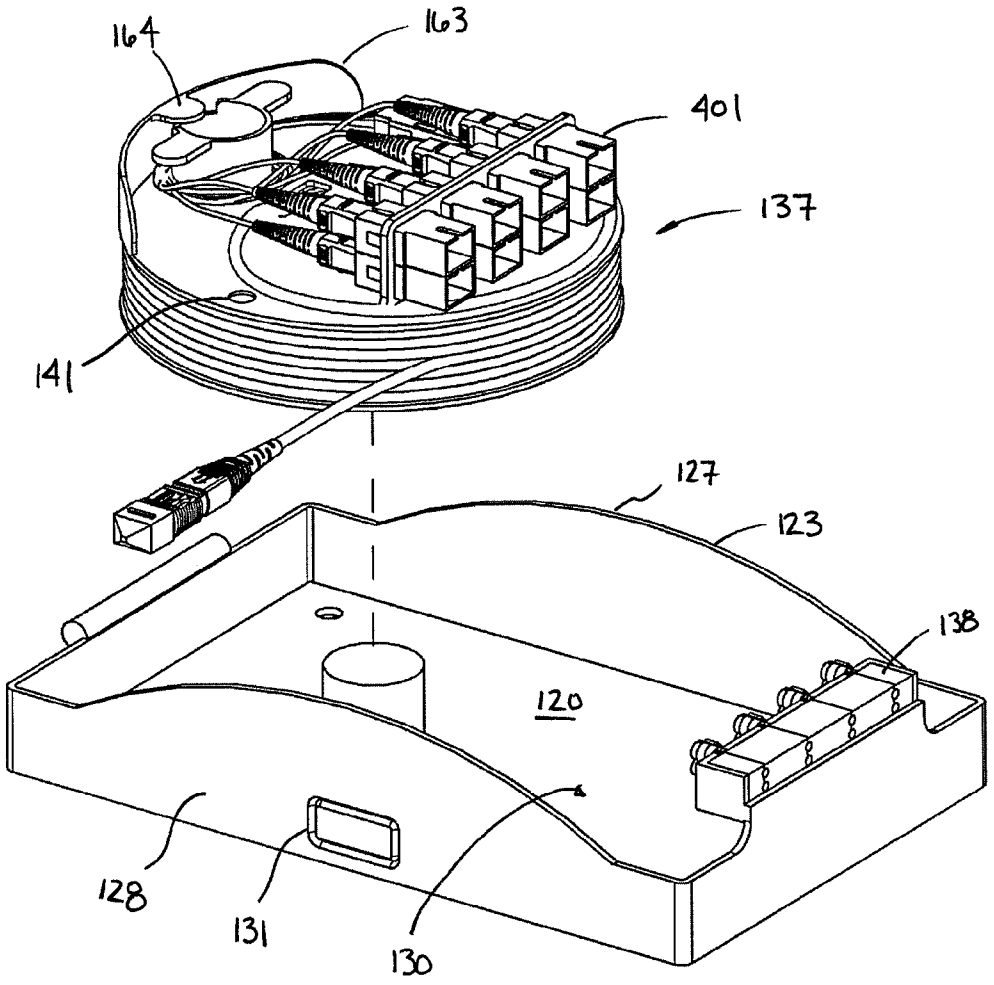


FIG. 15

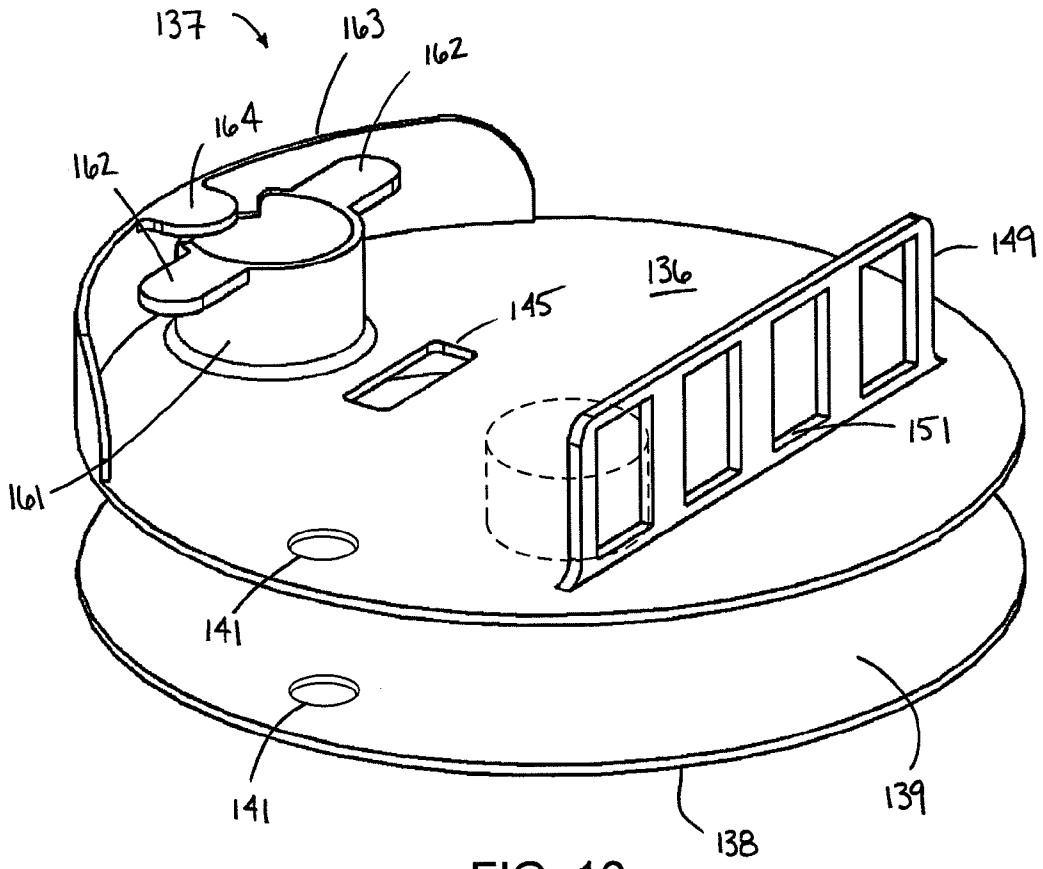


FIG. 16

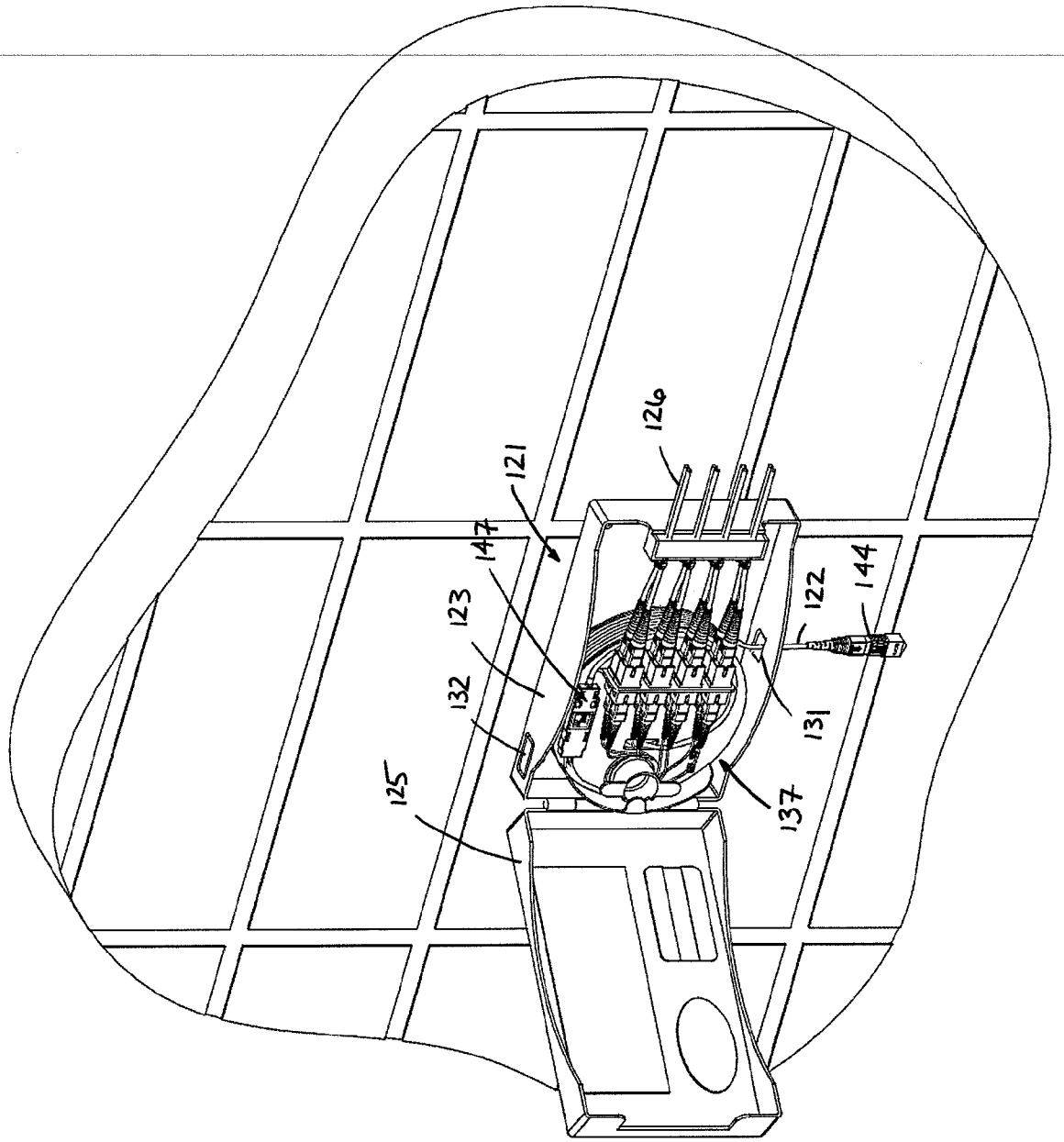


FIG. 17

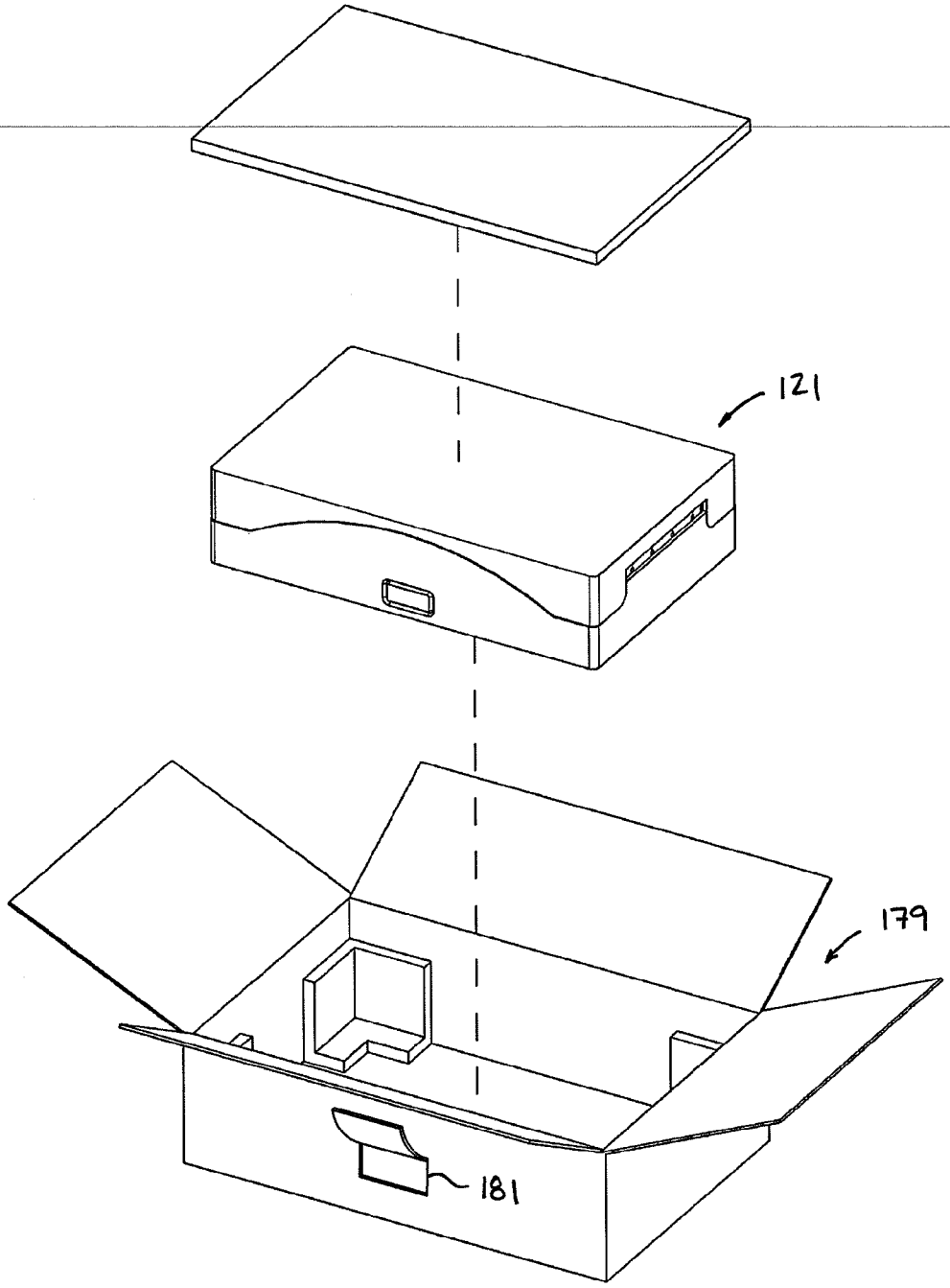


FIG. 18

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
61/029,158	15 February 2008

IPR2025-01119
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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.

(c) 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

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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.

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Electronic Acknowledgement Receipt

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Application Number:	12182705
International Application Number:	
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Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
First Named Inventor/Applicant Name:	Scott C. Kowalczyk
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Filer Authorized By:	Jarett Dykes Millar
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Deposit Account	132725
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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:					
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6	Fee Worksheet (PTO-06)	fee-info.pdf	8381 8bfe15d876cc200f29f0bb1e078c83ac4d8c8318	no	2
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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

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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
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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

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State or Province of mailing address::	Minnesota
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State or Province of mailing address::	Minnesota
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This application	Application claiming the benefit under 35 U.S.C. 119(e)	61/029,248	02/15/08

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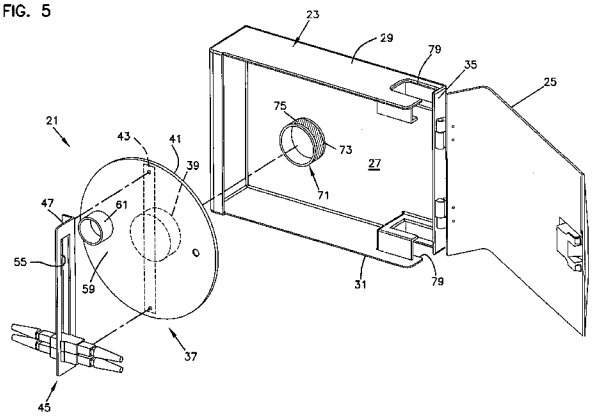
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(54) Title: FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

FIG. 5



(57) Abstract: 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).

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FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

Cross-Reference to Related Application

This application is being filed on 05 August 2008, as a PCT International Patent application in the name of ADC Telecommunications, Inc., a U.S. national corporation, applicant for the designation of all countries except the U.S., and Scott C. KOWALCZYK, a citizen of the U.S., Jonathan Walter COAN, a citizen of the U.S., and Jonathan KAML, a citizen of the U.S., applicants for the designation of the U.S. only, and claims priority to U.S. Provisional Patent Application Serial No. 60/954,214 filed on 06 August 2007, U.S. Provisional Patent Application Serial No. 61/029,248 filed on 15 February 2008, and U.S. Utility Patent Application Serial No. 12/182,705 filed on 30 July 2008.

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

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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.

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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

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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,

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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.

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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.

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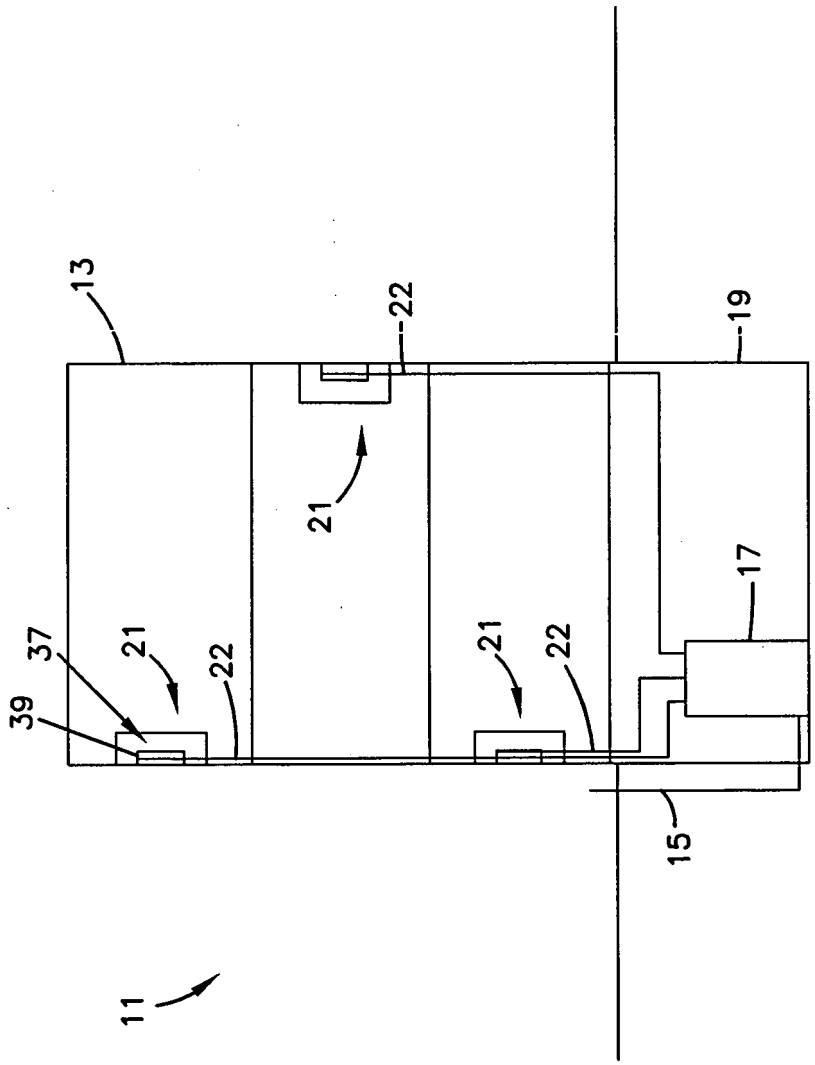


FIG. 1

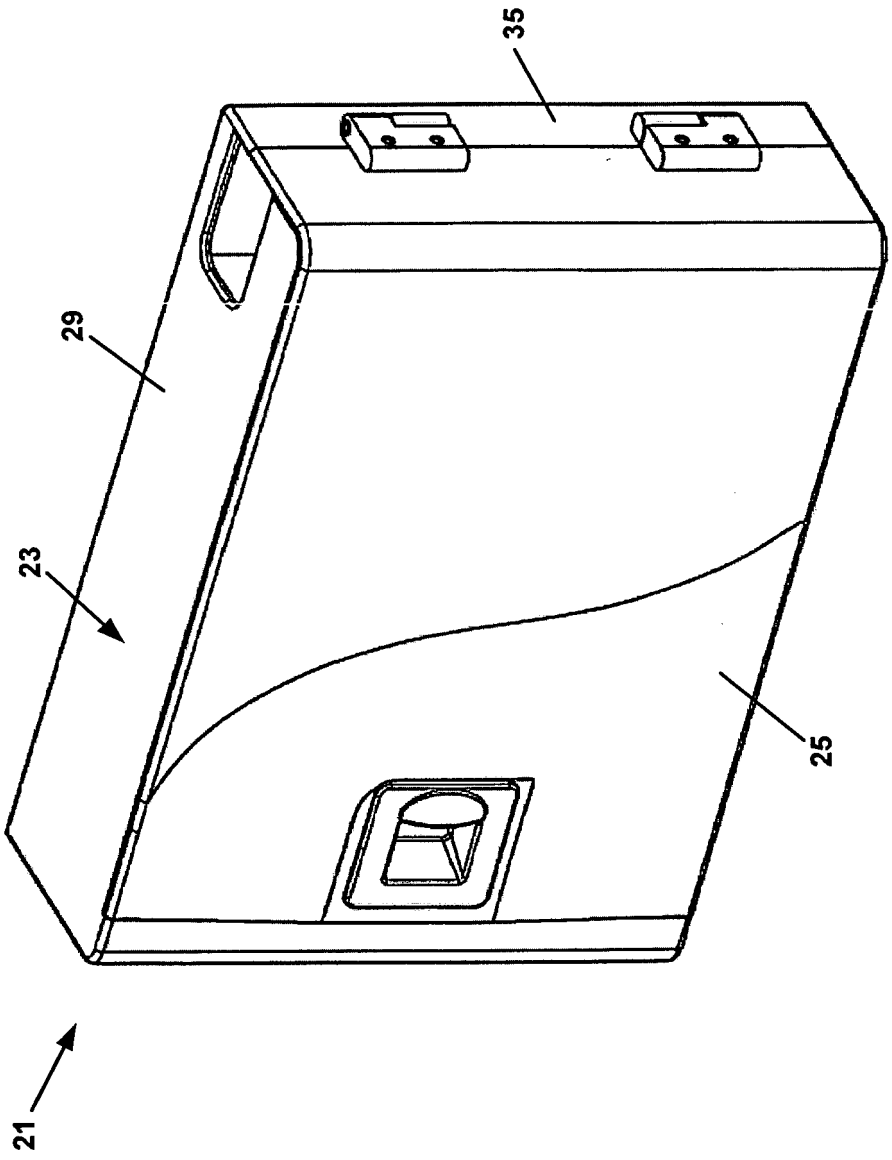


FIG. 2

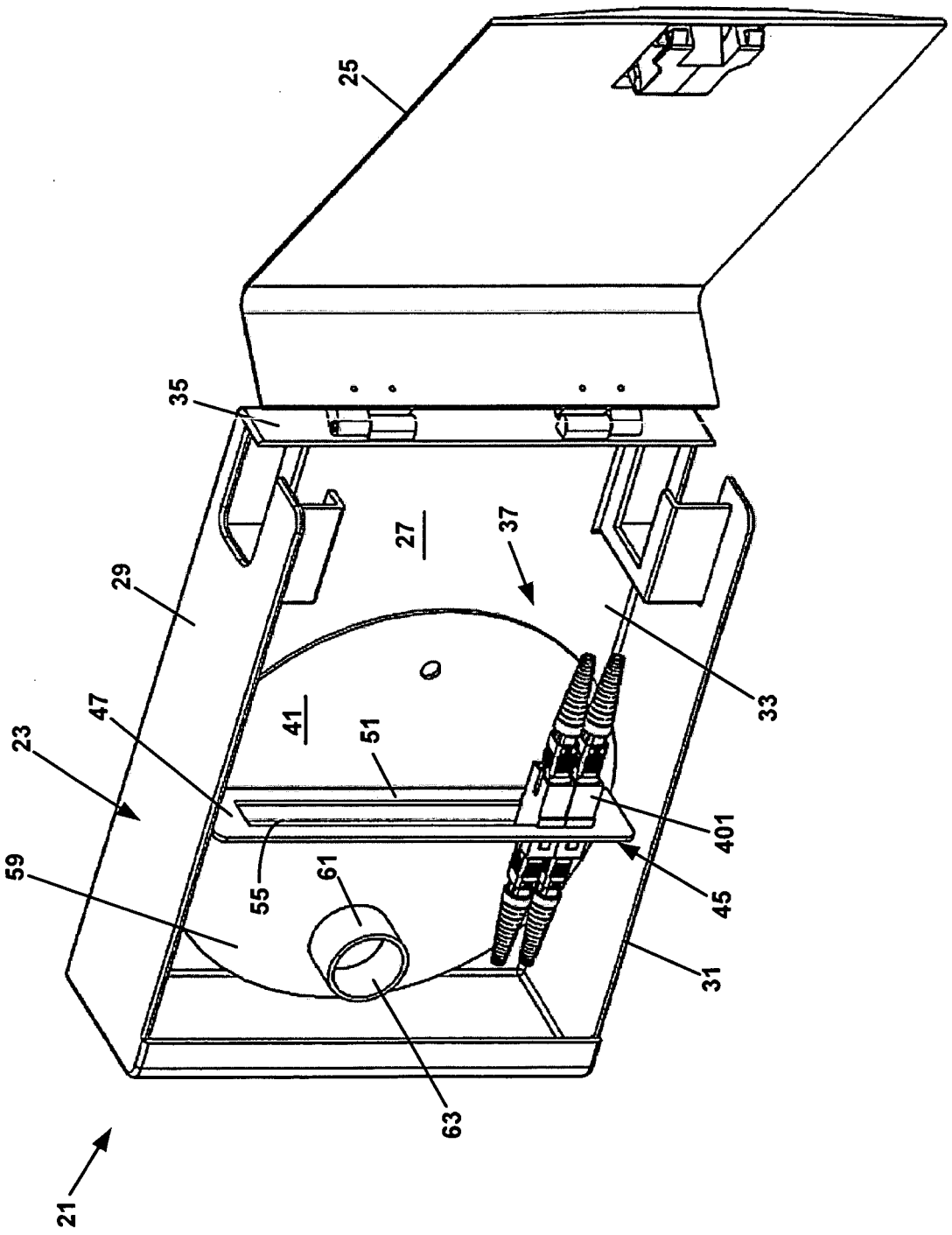


FIG. 3

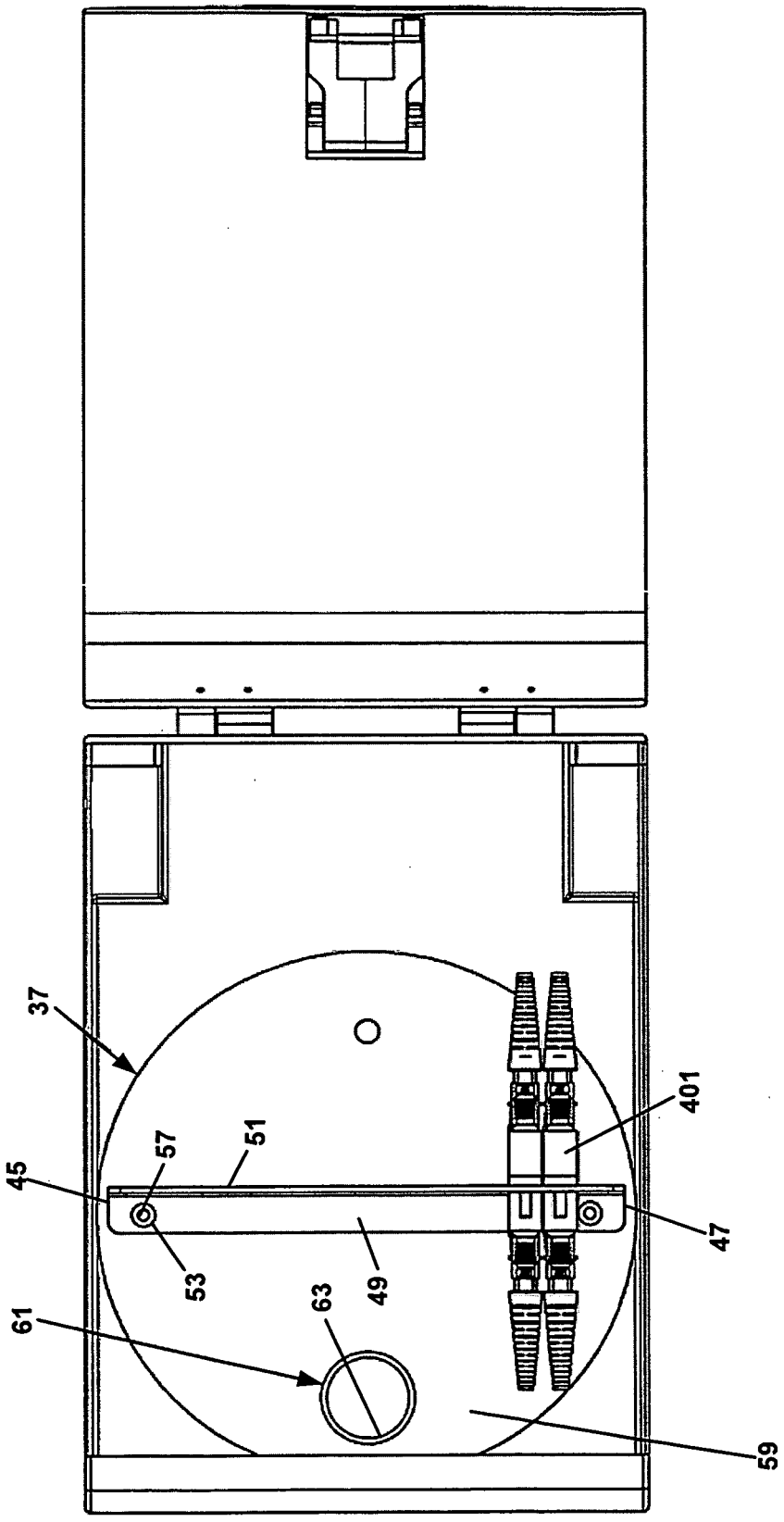


FIG. 4

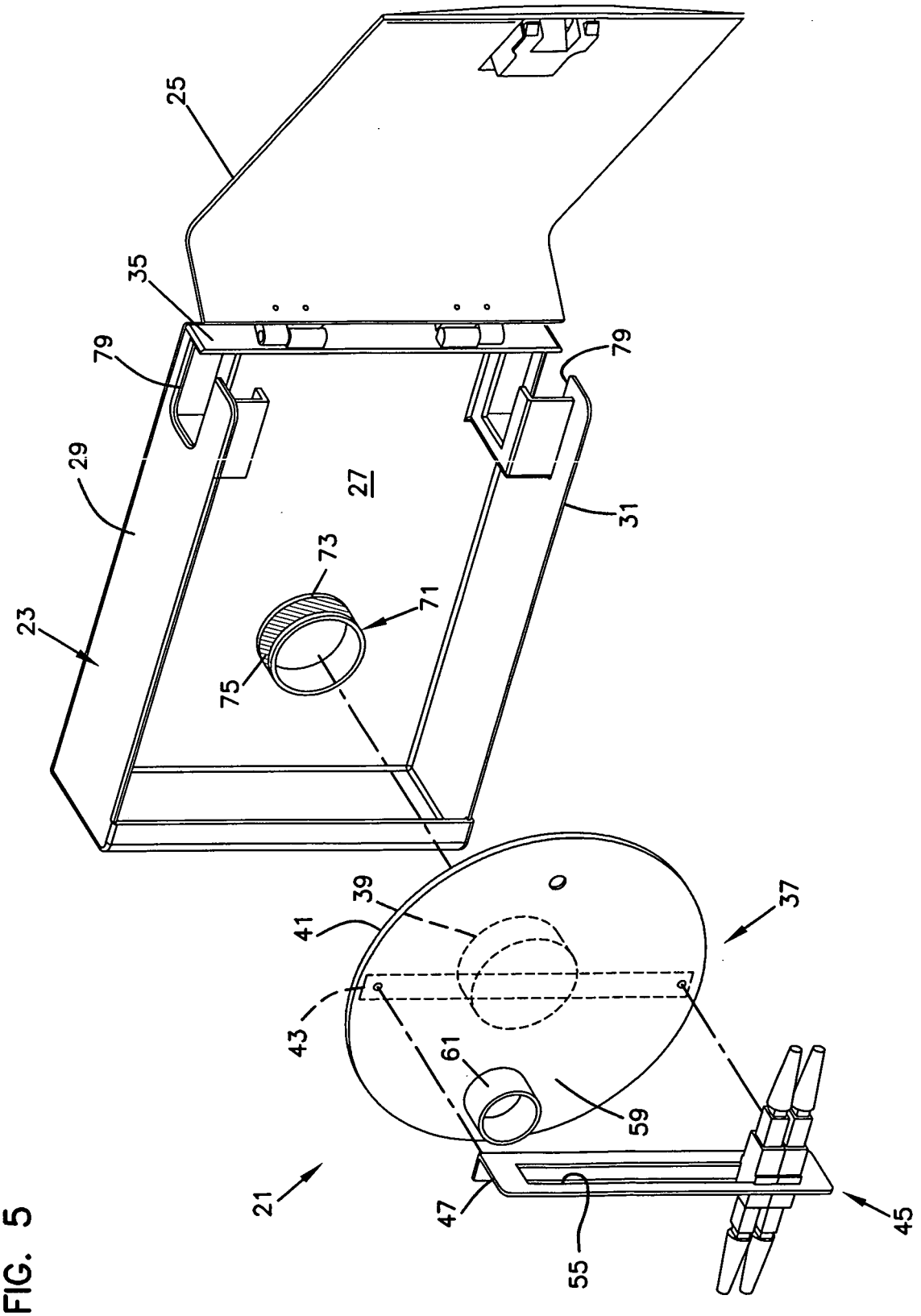


FIG. 5

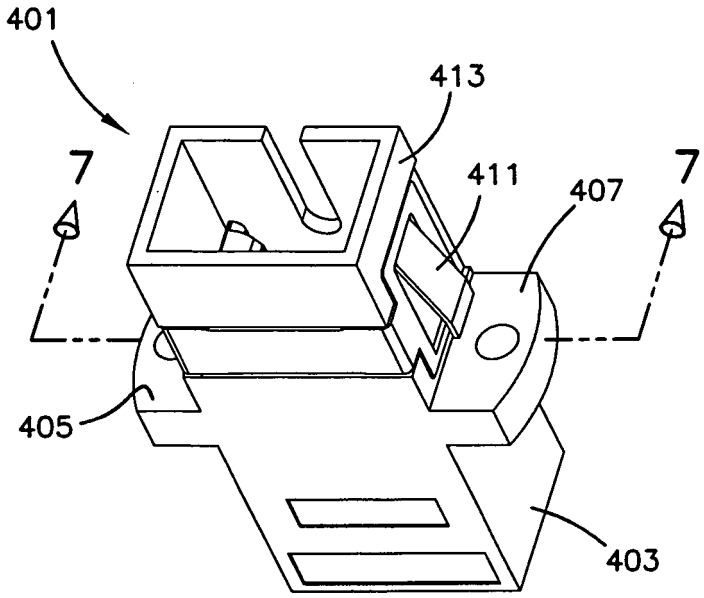


FIG. 6

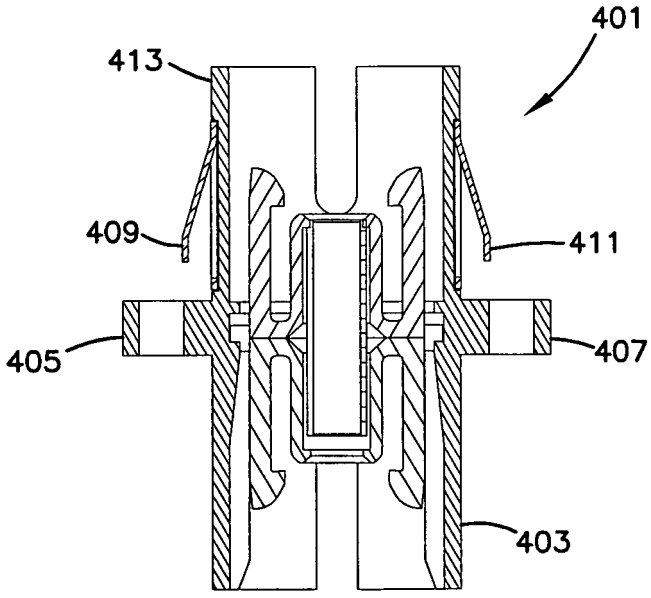


FIG. 7

FIG. 8

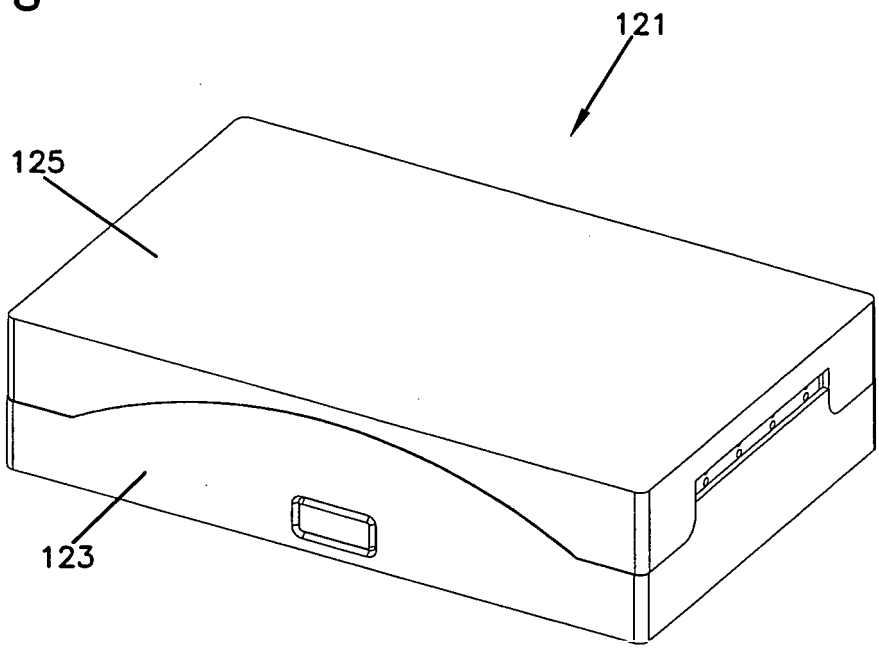


FIG. 9

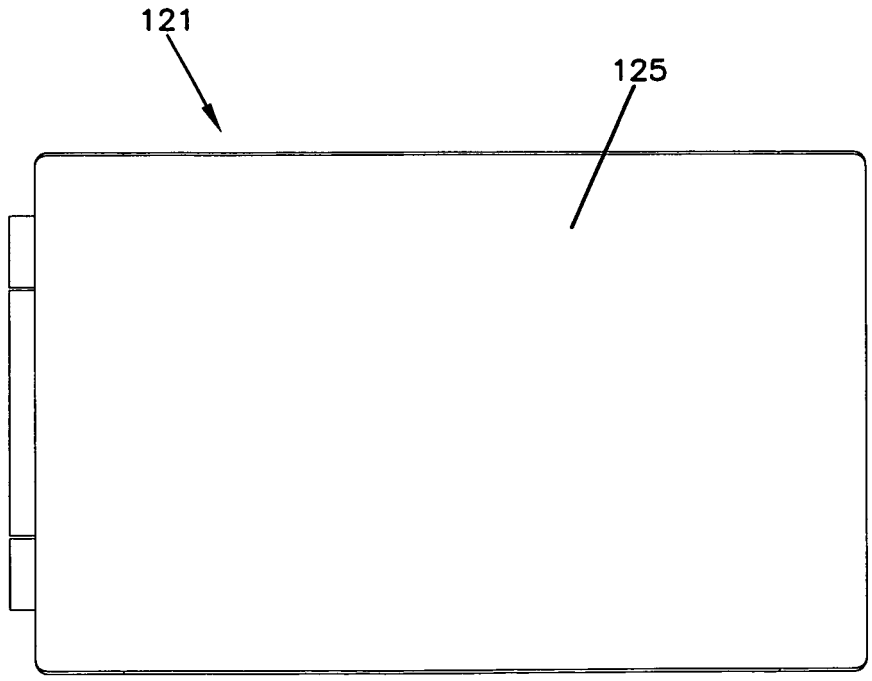


FIG. 10

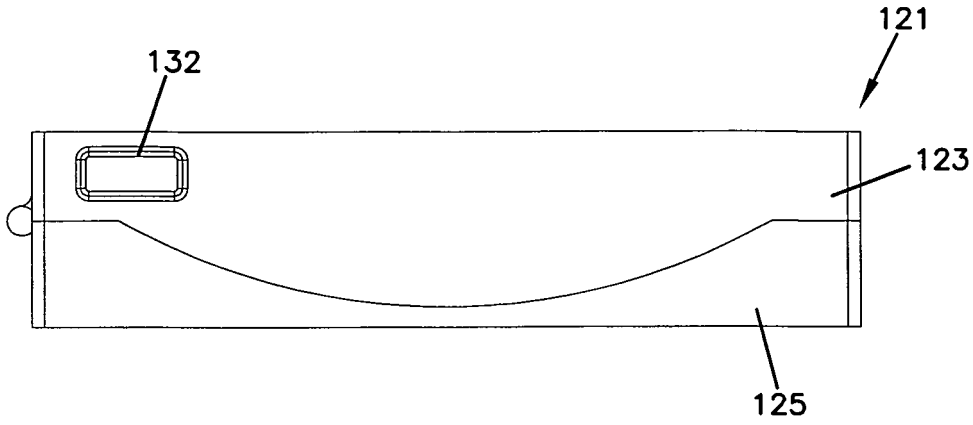


FIG. 11

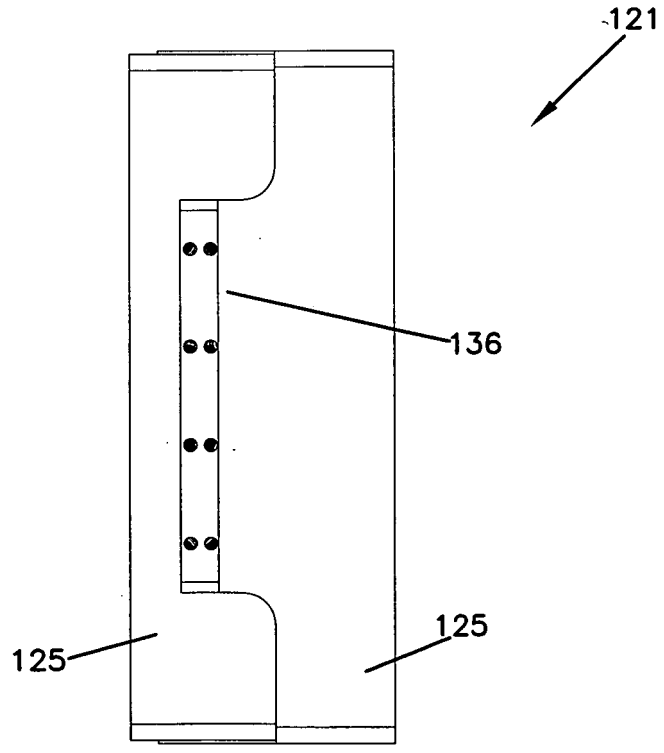


FIG. 12

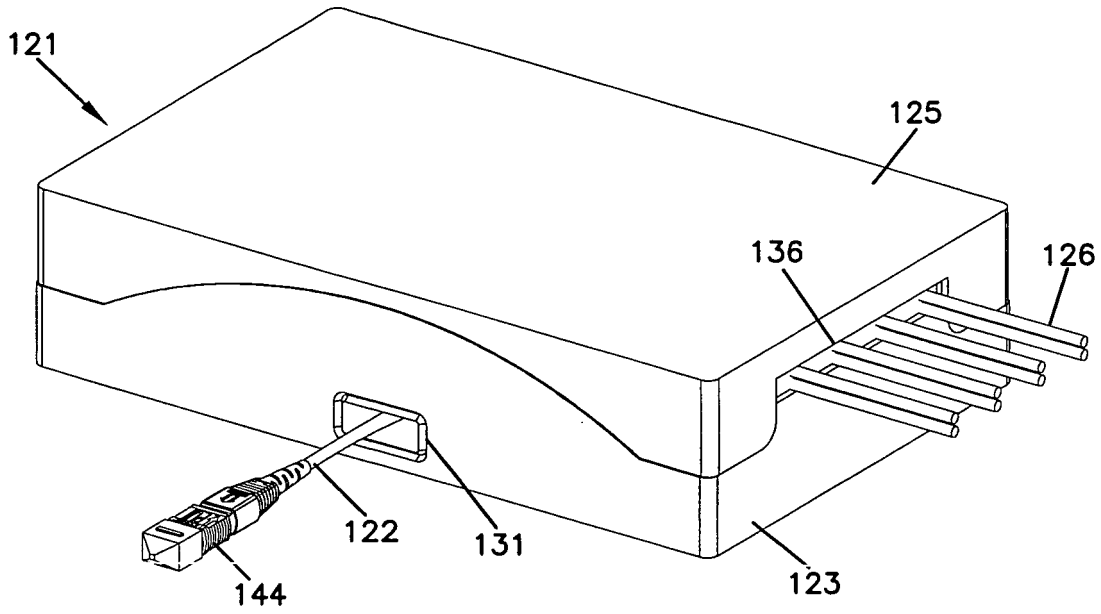
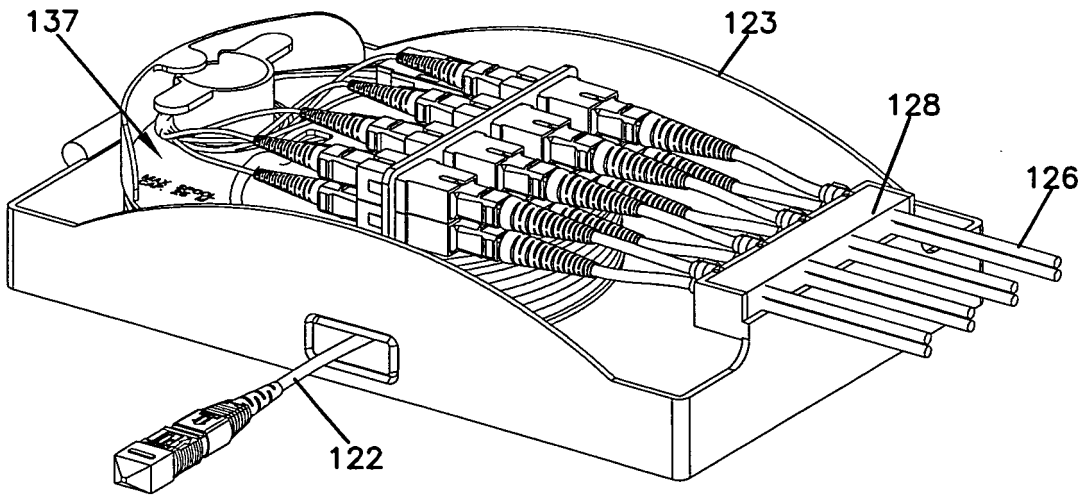


FIG. 13



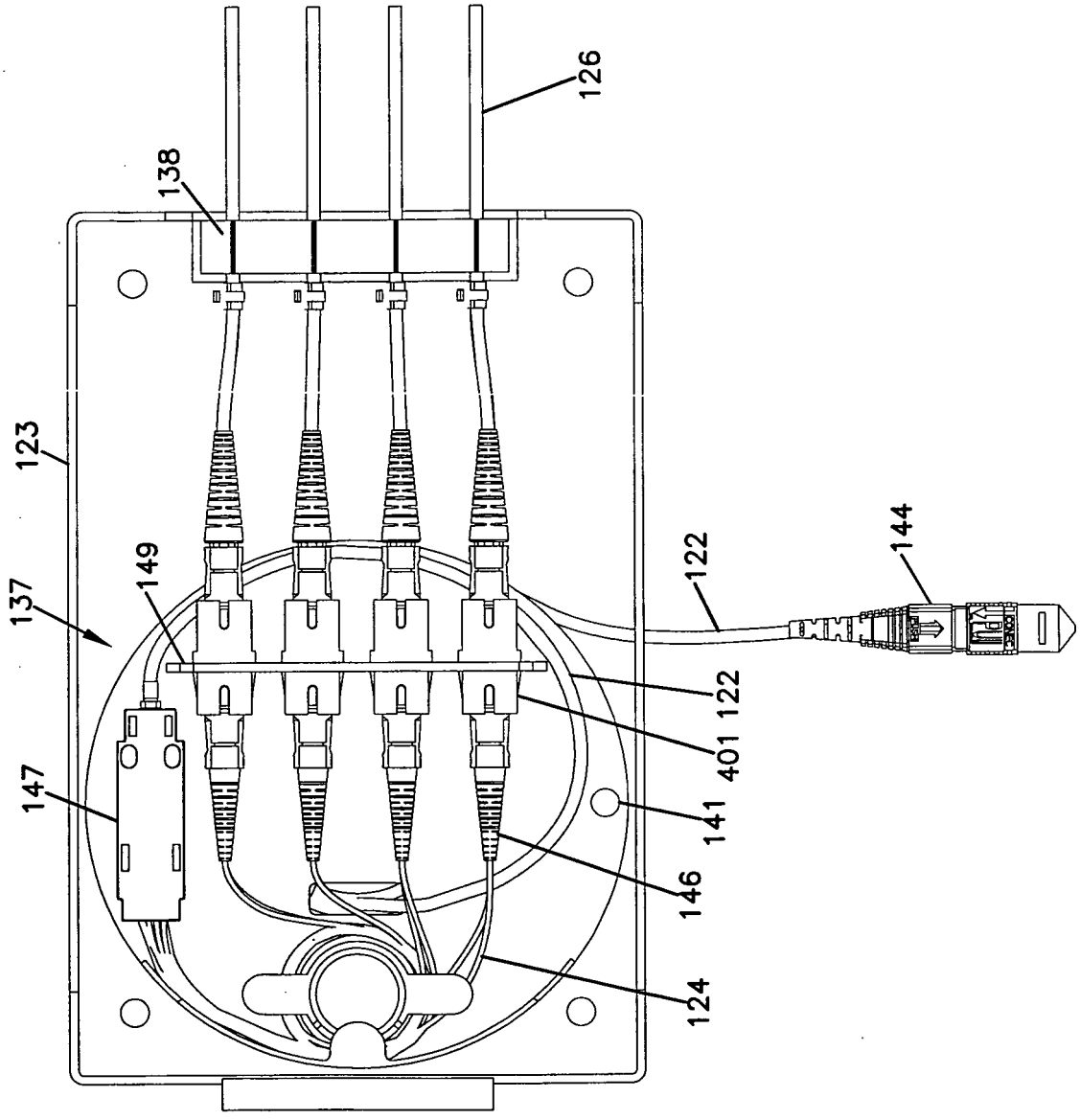


FIG. 14

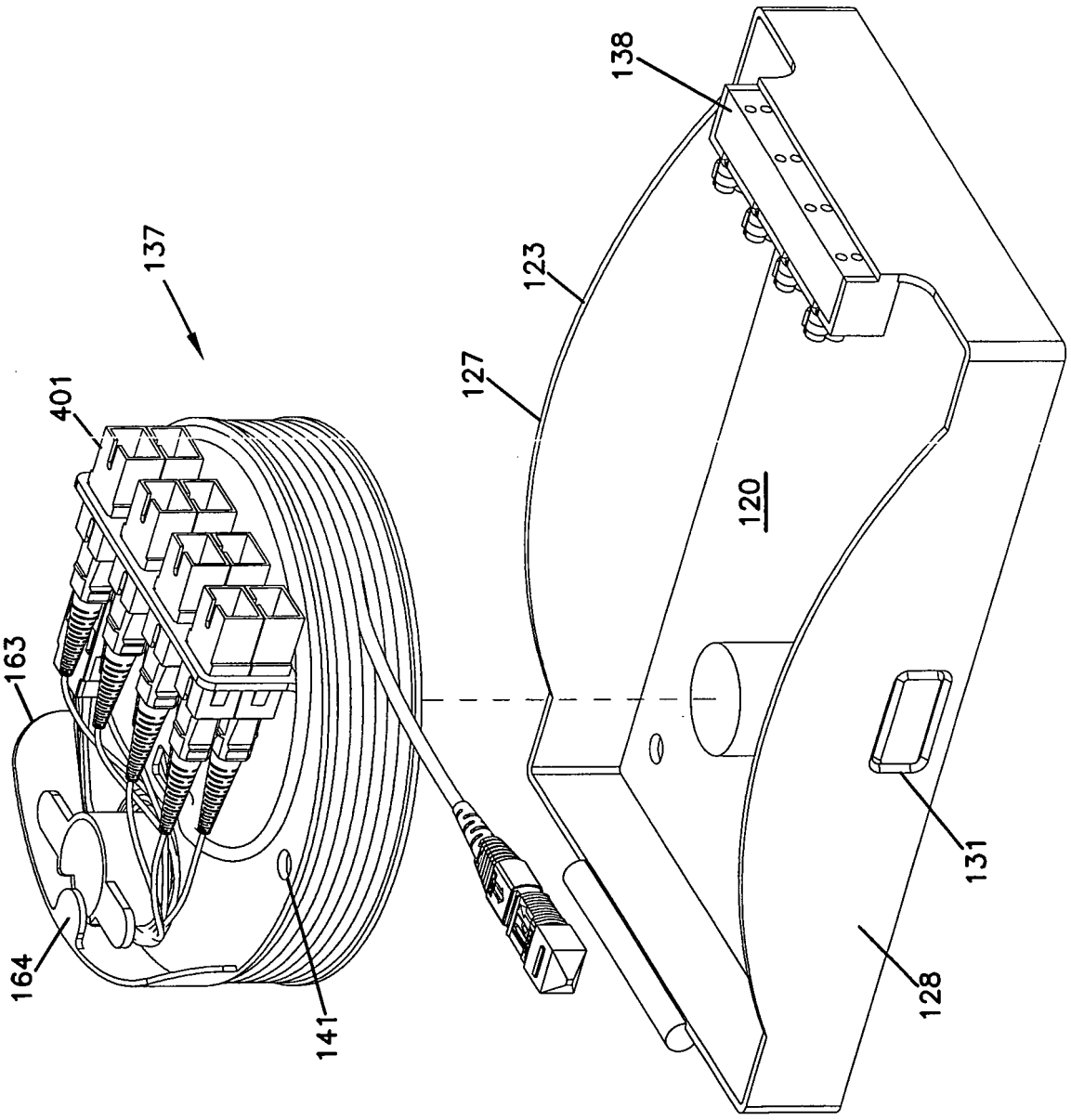


FIG. 15

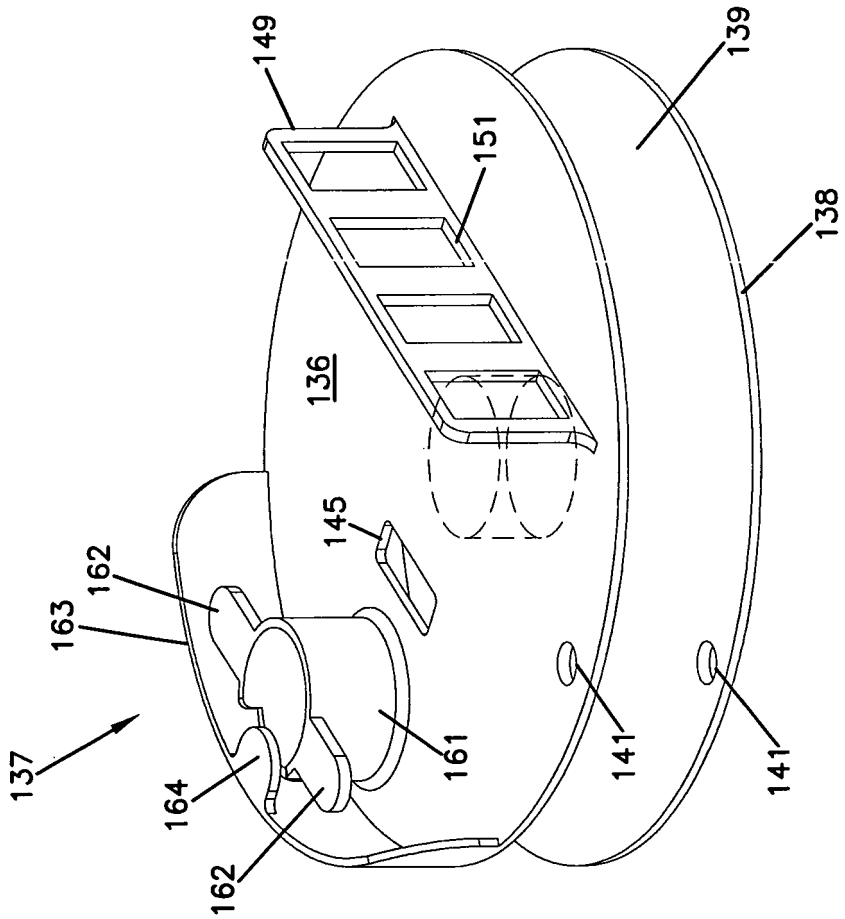


FIG. 16

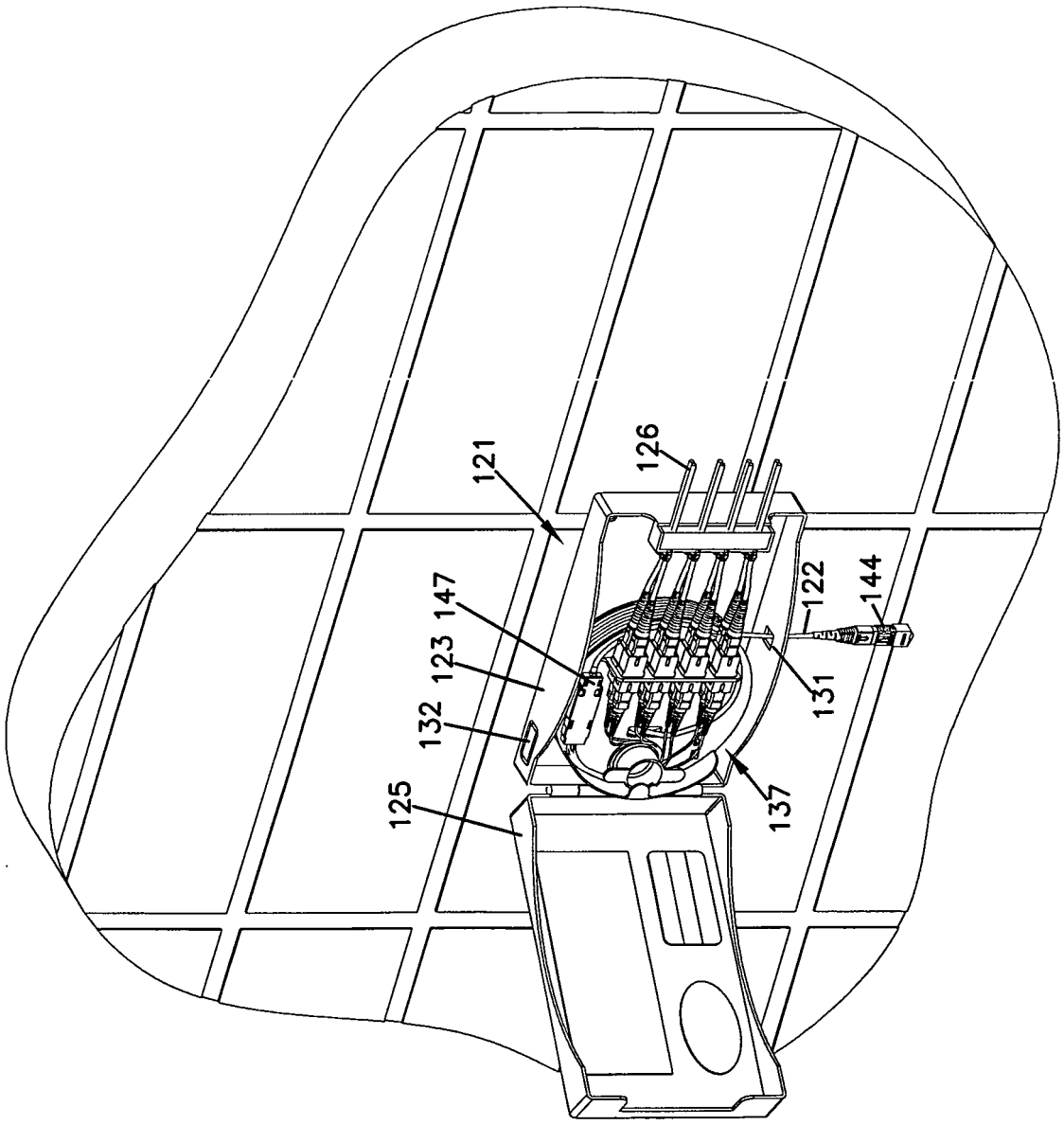
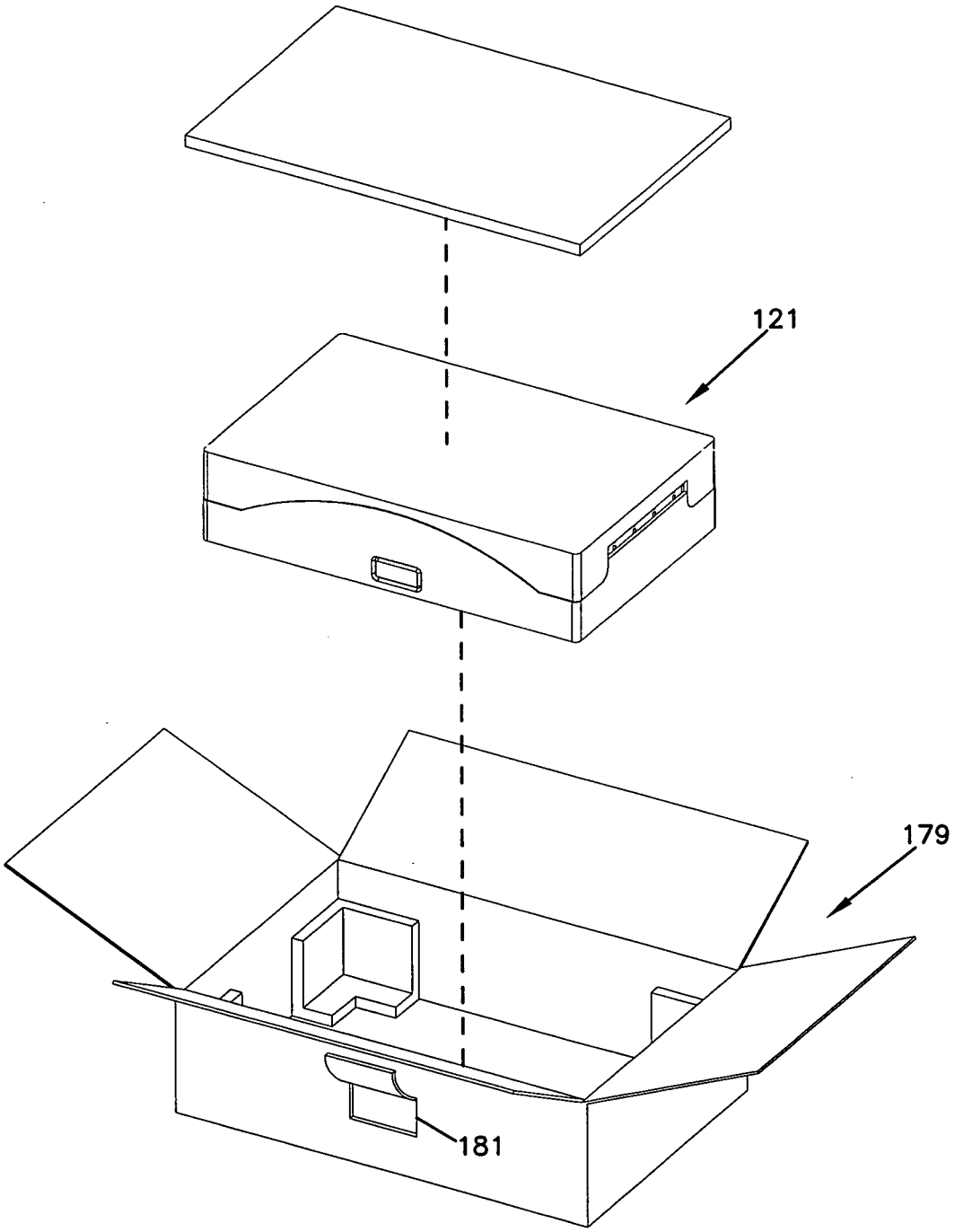


FIG. 17

FIG. 18



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

Form PCT/ISA/210 (second sheet) (April 2005)

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

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2008/072218

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EP 1107031 A	13-06-2001	CN 1305248 A	25-07-2001
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		KR 20010062142 A	07-07-2001
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		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	

Form PCT/ISA/210 (patent family annex) (April 2005)

European Patent Application 08837186.9
based upon PCT/US2008/072218

Applicant: ADC Telecommunications, Inc.

Our File: M/MGD-354-PC/EP

2. Appointed Representatives:

Dr. Eugen Popp
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Europäisches Patentamt
European Patent Office
Office européen des brevets

Entry into the European phase (EPO as designated or elected Office)

To the European Patent Office

European application number	EP08837186.9
PCT application number	PCT/US2008/072218
PCT publication number	WO2009048680
Applicant's or representative's reference	M/MGD-354-PC/EP
International Filing Date	05.08.2008
International Search Authority (ISA)	EP
International Preliminary Examination Authority (IPEA)	not applicable

1. Applicant

Indications concerning the applicant(s) are contained in the international publication or were recorded by the International Bureau after the international publication. ☒

Changes which have not yet been recorded by the International Bureau are set out here: ☐

2. Representative

This is the representative who will be listed in the Register of European Patents and to whom notifications will be made

Representative 1

Name:	Bohnenberger, Dr. Johannes
Registration No.:	100026677
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Address of place of business:	P.O. Box 86 06 24
	81633 München,
	Germany
Telephone:	+49 89 2121860
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3. Authorisation

An individual authorisation is attached. ☐

A general authorisation has been registered under No: ☐

A general authorisation has been filed, but not yet registered. ☐

The authorisation filed with the EPO as PCT receiving Office expressly includes the European phase. ☐

4. Request for examination

Examination of the application under Art. 94 EPC is hereby requested. The examination fee is being (has been, will be) paid. ☒

Request for examination in an admissible non-EPO language: ☐

The applicant waives his right to be asked under Rule 70(2) EPC whether he wishes to proceed further with the application. ☐

5. Copies

Additional copies of the documents cited in the supplementary European search report are requested. ☐

Number of additional sets of copies

6. Documents intended for proceedings before the EPO

6.1 Proceedings before the EPO as designated Office (PCT I) are to be based on the following documents:

the application documents published by the International Bureau (with all claims, description and drawings), where applicable with amended claims under Art. 19 PCT ☒

unless replaced by the amendments attached. ☐

Where necessary, clarifications should be attached as `Other documents`

6.2 Proceedings before the EPO as elected Office (PCT II) are to be based on the following documents:

the documents on which the international preliminary examination report is based, including any annexes ☐

unless replaced by the amendments attached. ☐

Where necessary, clarifications should be attached as `Other documents`

If the EPO as International Preliminary Examining Authority has been supplied with test reports, these may be used as the basis of proceedings before the EPO. ☐

7. Translations

Translations in one of the official languages of the EPO (English, French, German) are attached as crossed below: ☐

** In proceedings before the EPO as designated or elected Office (PCT I + II):*

Translation of the international application (description, claims, any text in the drawings) as originally filed, of the abstract as published and of any indication under Rule 13bis.3 and 13bis.4 PCT regarding biological material ☐

Translation of the priority application(s) (to be filed only at the EPO's request, Rule 53(3) EPC) ☐

It is hereby declared that the international application as originally filed is a complete translation of the previous application (Rule 53(3) EPC) ☐

** In addition, in proceedings before the EPO as designated Office (PCT I):*

Translation of amended claims and any statement under Art. 19 PCT, if the claims as amended are to form the basis for the proceedings before the EPO (see Section 6). ☐

** In addition, in proceedings before the EPO as elected Office (PCT II):*

Translation of annexes to the international preliminary examination report ☐

8. Biological material

The invention uses and/or relates to biological material deposited under Rule 31 EPC. ☐

The particulars referred to in Rule 31(1)(c) EPC (if not yet known, the depositary institution and the identification reference(s)) [number, symbols, etc.] of the depositor) are given in the international publication or in the translation submitted in Section 7 on: ☐

page(s) / line(s)

The receipt(s) of deposit issued by the depositary institution

is (are) enclosed. ☐

will be filed later. ☐

Waiver of the right to an undertaking from the requester pursuant to Rule 33(2) EPC attached. ☐

9. Nucleotide and amino acid sequences

The items pursuant to Rules 5.2 and 13ter PCT, Rules 30 and 163(3) EPC are already with the EPO. ☐

The sequence listing is attached in PDF format. ☐

The sequence listing does not include matter which goes beyond the content of the application as filed. ☐

The sequence listing data is also attached in computer-readable form in accordance with WIPO Standard 25. ☐

The sequence listing data in computer-readable form in accordance with WIPO Standard 25 is identical to the sequence listing in PDF format. ☐

10. Designation fees

All the contracting states party to the EPC at the time of filing of the international patent application and designated in the international application are deemed to be designated (see Article 79(1) EPC). ☒

AT BE BG CH&LI CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LT LU LV MC MT NL NO PL PT RO SE SI SK TR

10.1 It is currently intended to pay fewer than seven designation fees, for the following contracting states: ☐

10.2 If contracting states are indicated in Section 10.1, it is agreed that for the ☐

contracting states not thus indicated no communication under Rule 112(1) EPC be issued and further processing be excluded.

11. Extension of the European patent

☐

This application is deemed to be a request to extend the European patent application and the European patent granted in respect of it to all the non-contracting states to the EPC designated in the international application and with which extension agreements are in force on the date on which the international application is filed. However, the extension only takes effect if the prescribed extension fee is paid.

It is currently intended to pay the extension fee for the following states:

Note: Under the automatic debiting procedure, extension fees will only be debited for states indicated here, unless the EPO is instructed otherwise before expiry of the period for payment.

12. List of enclosed documents

	Description of document	Original file name	Assigned file name
1	appointed representatives	MGD-354-PCEP_Appointed representatives_e_0.pdf	OTHER-1.pdf

13. Mode of payment: Debit from deposit account

☒

Currency: EUR

The European Patent Office is hereby authorised, to debit from the deposit account with the EPO any fees and costs indicated on the fees page.

Deposit account number: 28000438

Account holder: Meissner, Bolte & Partner GbR

14. Any refunds should be made to the following EPO deposit account:

☐

15. Fees

		Factor/reduction applied	Fee schedule	Amount to be paid
15-1	002 Fee for a European search - Applications filed on/after 01.07.2005	0	1 050.00	0.00
15-2	005e Designation fee - For all contracting States designated for applications filed on/after 01.04.2009	1	500.00	500.00
15-3	006e Examination fee - For applications filed before 01.07.2005 and for international applications filed on/after 01.07.2005 without supplementary European search report	1	1 565.00	1 565.00
15-4	020 Filing fee - entry EP phase - online	1	100.00	100.00
15-5	520 Additional filing fee for the 36th and each subsequent page - entry into EP phase	0	12.00	0.00
	Total:		**EUR**	**2 165.00**

16. Annotations

17. Signature(s) of applicant(s) or representative

Place: **München**

Date: **11 February 2010**

Signed by: **DE, Meissner, Bolte & Partner, J. Bohnenberger 6449**

Capacity: **(Representative)**

Europäisches Patentamt
European Patent Office
Office européen des brevets

Acknowledgement of receipt

We hereby acknowledge receipt of the form for entry into the European phase (EPO as designated or elected Office) as follows:

Submission number	753661
PCT application number	PCT/US2008/072218
EP application number	08837186.9
Date of receipt	11 February 2010
Receiving Office	European Patent Office, The Hague
Your reference	M/MGD-354-PC/EP
Applicant	
Country	
Documents submitted	package-data.xml application-body.xml OTHER-1.pdf\MGD-354-PCEP_Appointed representatives_e_0.pdf (1 p.) ep-euro-pct.xml epf1200.pdf (3 p.)
Submitted by	CN=J. Bohnenberger 6449,O=Meissner, Bolte & Partner,C=DE
Method of submission	Online
Date and time receipt generated	11 February 2010, 13:54 (CET)
Message Digest	B8:9C:3E:18:58:4A:AF:2F:CD:97:51:84:94:98:FB:4C:66:4F:B2:D9

Correction by the EPO of errors in debit instructions filed by eOLF

Errors in debit instructions filed by eOLF that are caused by the editing of Form 1038E entries or the continued use of outdated software (all forms) may be corrected automatically by the EPO, leaving the payment date unchanged (see decision T 152/82, OJ EPO 1984, 301 and point 6.3 ff ADA, Supplement to OJ EPO 10/2007).

/European Patent Office/

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 2316.2584WOU2	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2008/072218	International filing date *(day/month/year)* 05 August 2008 (05.08.2008)	Priority date *(day/month/year)* 06 August 2007 (06.08.2007)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant ADC TELECOMMUNICATIONS, INC.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	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 Article 35(2) 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

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 09 February 2010 (09.02.2010)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Beate Giffo-Schmitt e-mail: pt03.pct@wipo.int

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. PCT/US2008/072218	International filing date *(day/month/year)* 05.08.2008
Priority date *(day/month/year)* 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 25901-646

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.

Europäisches Patentamt
European Patent Office
Office européen des brevets

European Patent Office
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GERMANY
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81633 München
ALLEMAGNE

Date 17-03-2010

Reference	Application No./Patent No.
M/MGD-354-PC/EP	08837186.9 - 1524 PCT/US2008072218

Applicant/Proprietor
ADC Telecommunications, INC.

Communication pursuant to Rules 161 and 162 EPC

(1) Amendment of application documents, especially the claims (R. 161 EPC)

The above mentioned international (Euro-PCT) application has entered the European phase.

Under Articles 28, 41 PCT, Rules 52, 78 PCT and Rule 137(2) to (4) EPC, the applicant may amend the application documents after receiving the international search report.

Whether or not he has already done so, he now has a further opportunity to file amended claims or other application documents within a non-extendable period of ONE MONTH after notification of the present communication (R. 161 EPC).

The claims applicable on expiry of the above time limit, i.e. those filed on entry into the European phase or in response to the present communication, will form the basis for the calculation of any claims fee to be paid (see page 2) and for any supplementary search to be carried out under Article 153(7) EPC (R. 161 EPC).

--2/

(2) Claims fees under Rule 162 EPC

If the application documents on which the European grant procedure is to be based comprise more than fifteen claims, a claims fee shall be payable for the sixteenth and each subsequent claim within the period provided for in Rule 159(1) EPC.

☐ Based on the application documents currently on file, all necessary claims fees have already been paid (or the documents do not comprise more than 15 claims).

☐ All necessary fees will be/have been debited automatically according to the automatic debit order.

☑ The claims fees due for the claims 16 to 17 were not paid within the above-mentioned period.

Any non-paid claims fee, either based on the current set of claims or on any amended claims to be filed pursuant to Rule 161 EPC (see page 1), may still be validly paid within a non-extendable period of **one month** after notification of this communication (R. 162(2) EPC).

If a payment is made for only some of the claims, it must be indicated for which claims it is intended. If a claims fee is not paid in due time, the claim concerned is deemed to be abandoned (R. 162(4) EPC).

If claims fees have already been paid, but on expiry of the above-mentioned period there is a new set of claims containing fewer fee-incurring claims than previously, the claims fees in excess of those due under Rule 162(2), 2nd sentence EPC will be refunded (R. 162(3) EPC).

You are reminded that any supplementary search under Article 153(7) EPC will relate only to the last set of claims applicable on expiry of the above period AND will be confined to those fee-incurring claims for which fees have been paid in due time.

The present amount of the claims fee is

EUR 200 for the 16th and each subsequent claim up to the limit of 50
EUR 500 for the 51st and each subsequent claim

Note to users of the automatic debiting procedure
Unless the EPO receives prior instructions to the contrary, the fees for all claims incurring fees will be debited on the last day of the period for payment. For further details see the Arrangements for the automatic debiting procedure, Supplement to OJ EPO 3/2009.

For the Examining Division

Europäisches Patentamt • European Patent Office • Office européen des brevets

Europäisches Patentamt
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Office européen des brevets

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For any questions about this communication:
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Date
24.03.10

Reference	Application No./Patent No.
M/MGD-354-PC/EP	08837186.9 - 1524 / 2176696

Applicant/Proprietor
ADC Telecommunications, INC.

Communication of European publication number and information on the application of Article 67(3) EPC

The provisional protection under Article 67(1) and (2) EPC in the individual Contracting States becomes effective only when the conditions referred to in Article 67(3) EPC have been fulfilled (for further details, see information brochure of the European Patent Office "National Law relating to the EPC" and additional information in the Official Journal of the European Patent Office).

Pursuant to Article 153(3) EPC the publication under Article 21 PCT of an international application for which the European Patent Office is a designated or elected Office takes the place of the publication of a European patent application.

The bibliographic data of the above-mentioned Euro-PCT application will be published on 21.04.10 in Section I.1 of the European Patent Bulletin. The European publication number is 2176696.

In all future communications to the European Patent Office, please quote the application number plus Directorate number.

Receiving Section

MEISSNER BOLTE

Meissner Bolte & Partner GbR · Postfach/P.O. Box 860624 · D-81633 München

European Patent Office

80298 München

EPO - Munich
73
26.April 2010

Patentanwälte
European Patent Attorneys
European Trademark Attorneys
European Design Attorneys
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Datum Date	Ihr Zeichen Your ref.	Unser Zeichen Our ref.	Ihr Ansprechpartner Your contact
April 23, 2010 BO/st	08837186.9-1524	M/MGD-354-PC/EP	Dr. J. Bohnenberger

European Patent Application No. 08837186.9-1524
„FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL"
ADC Telecommunications, Inc.

ip_law@mbp.®

Regarding the Communication pursuant to Rules 161 and 162 EPC dated March 17, 2010:

Further to the Communication dated March 17, 2010 inviting the applicant to make any amendments under Rules 161 EPC, the applicant files new claims 1-15.

The claims have been amended as shown in the enclosed, marked-up version.

It is requested that these claims form the basis for the continued Examination of the file.

Dr. Johannes Bohnenberger
European Patent Attorney

Enclosures:
- new claims 1-15
- marked up claims

VOLUNTARY AMENDMENTS

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; ~~and~~

a termination module disposed on the cable spool so that the termination module rotates in unison with the cable spool;

a cable manager disposed on an 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 connectorized ends that are routed to the termination module.

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. (Original) 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. (Original) A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module includes a plurality of sliding adapter modules.

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. (Canceled)

7. (Currently Amended) A fiber optic enclosure assembly as claimed in claim [[6]] 19, wherein the ~~slack storage area includes~~ cable manager is a cable management spool.

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

providing a fiber optic enclosure including:

a housing defining an interior region;

a cable spool disposed in the interior region, the cable spool having a spooling portion;

a termination module disposed on the cable spool;

a first fiber optic cable coiled around the spooling portion of the cable spool, the first fiber optic cable including connectorized ends that are engaged with the termination module;

rotating [[a]] the cable spool~~, which includes a fiber optic cable coiled around a spooling portion of the cable spool,~~ about an axis of [[a]] the housing of [[a]] the fiber optic enclosure until a desired length of the first 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~~; and

connecting a connectorized end of a second fiber optic cable to the termination module in the interior region of the fiber optic enclosure.

9. (Canceled)

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

14. (Original) 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. (Canceled)

16. (Currently Amended) 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 the first 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 manager includes an outer radius that is larger than a minimum bend radius of the fiber optic cable.

Claims

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;

a termination module disposed on the cable spool so that the termination module rotates in unison with the cable spool;

a cable manager disposed on an 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 connectorized ends that are routed to the termination module.

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 the axial end of the cable spool defines a cable passage.

6. A fiber optic enclosure assembly as claimed in claim 1, wherein the cable manager is a cable management spool.

7. A method of paying out a fiber optic cable from a fiber optic enclosure, comprising:

providing a fiber optic enclosure including:

a housing defining an interior region;

a cable spool disposed in the interior region, the cable spool having a spooling portion;

a termination module disposed on the cable spool;

a first fiber optic cable coiled around the spooling portion of the cable spool, the first fiber optic cable including connectorized ends that are engaged with the termination module;

rotating the cable spool about an axis of the housing of the fiber optic enclosure until a desired length of the first fiber optic cable is paid out; and

connecting a connectorized end of a second fiber optic cable to the termination module in the interior region of the fiber optic enclosure.

8. 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.

9. 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.

10. 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.

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

12. 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.

13. 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 the first fiber optic cable has been paid out.

14. 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.

15. A fiber optic enclosure assembly as claimed in claim 1, wherein the cable manager includes an outer radius that is larger than a minimum bend radius of the fiber optic cable.

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Application No.	Ref.	Date
08 837 186.9 - 1524	M/MGD-354-PC/EP	01.04.2011
Applicant: ADC Telecommunications, INC.		

Communication pursuant to Article 94(3) EPC

The examination of the above-identified application has revealed that it does not meet the requirements of the European Patent Convention for the reasons enclosed herewith. If the deficiencies indicated are not rectified the application may be refused pursuant to Article 97(2) EPC.

You are invited to file your observations and insofar as the deficiencies are such as to be rectifiable, to correct the indicated deficiencies within a period

of 4 months

from the notification of this communication, this period being computed in accordance with Rules 126(2) and 131(2) and (4) EPC. One set of amendments to the description, claims and drawings is to be filed within the said period on separate sheets (R. 50(1) EPC).

If filing amendments, you must identify them and indicate the basis for them in the application as filed. Failure to meet either requirement may lead to a communication from the Examining Division requesting that you correct this deficiency (R. 137(4) EPC).

Failure to comply with this invitation in due time will result in the application being deemed to be withdrawn (Art. 94(4) EPC).

Verdrager, Véronique
Primary Examiner
For the Examining Division

Enclosure(s): 3 page/s reasons (Form 2906)

IPR2025-01119
Page 219 of 412
Belden EX1010

The examination is being carried out on the **following application documents**

Description, Pages

1-11 as published

Claims, Numbers

1-18 received on 26-04-2010 with letter of 23-04-2010

Drawings, Sheets

1/14-14/14 as published

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. Novelty

2.1 The present application does not meet the requirements of Article 52(1) EPC, because the subject-matter of claim 1 is not new in the sense of Article 54(1) and (2) EPC.

2.2 Document D1 discloses a fiber optic enclosure assembly for enclosing optical fiber connections (figures 1,5; column 2, line 6 - column 3, line 15) comprising:

a housing (27) having an interior region;

a bearing mount (41) disposed in the interior region of the housing;

a cable spool (11) engaged with the bearing mount such that the cable spool (11) selectively rotates within the housing (column 2, lines 41-47);

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

a cable manager (63) disposed on an axial end (13) of the cable spool (11) (column 3, lines 11-13); and

a fiber optic cable (23) wrapped about a spooling portion of the cable spool, the fiber optic cable having connectorized ends that are routed to the termination module (47,53) (figure 5; column 3, lines 13-15).

The subject-matter of claim 1 is therefore not new.

3. Inventive step

3.1 The present application does not meet the requirements of Article 33(3) PCT, because the subject-matter of claims 2-5,7-8,10-14,16-18 does not involve an inventive step.

3.2 Independent claim 8 defines a method of paying out a fiber optic cable from a fiber optic enclosure as defined in claim 1. Such a method is described in D1 (column 4, lines 32-61). Claim 8 defines that the method comprises connecting a connectorized end of a second fiber optic cable to the termination module in the interior region of the fiber optic enclosure. D1 describes that the connector panel (53) must be removed from reel docking station (27) and mount it to frame docking station (43) as shown in figure 6. The slight constructional change of claim 8 comes within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can be readily contemplated in advance. Consequently, the subject-matter of claim 8 appears to lack an inventive step.

3.3 D1 discloses the additional features introduced by dependent claims 10,13,16,17:

- 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.

3.4 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).

3.5 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).

3.6 The feature of claim 14 (housing mounted to a wall) is merely one 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.

3.7 In claim 7 (cable management spool) a slight constructional change is defined which comes within the scope of the customary practice followed by persons skilled in the art. A skilled person would think of a spool to store an overlength of cable.

3.8 It would also be obvious for the skilled person to choose for this cable management spool an outer radius that is larger than a minimum bend radius of the fiber optical cable. Thus the subject-matter of claim 18 also appears to lack an inventive step.

4. Formal aspects

4.1 Independent claims 1 and 8 are not in the two-part form in accordance with Rule 43(1) EPC.

4.2 Reference signs placed in parentheses should be inserted in all claims (Rule 43 (7) EPC).

4.3 To meet the requirements of Rule 42(1)(b) EPC, the document D1 should be identified in the description and the relevant background art disclosed therein should be briefly discussed.

4.4 The applicant is requested to bring the description into conformity with the new claims (to adapt the summary of the invention and to delete embodiments not falling under the new independent claim), and to reason the inventive step of the independent claim in terms of the problem and its solution.

4.5 In order to facilitate the examination of the conformity of the amended application with the requirements of Article 123(2) EPC, the applicant is requested to clearly identify the amendments carried out, irrespective of 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.

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.

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02. Aug. 2011

Datum Date	Ihr Zeichen Your ref.	Unser Zeichen Our ref.	Ihr Ansprechpartner Your contact
August 1, 2011 BO/st	08837186.9-1524	M/MGD-354-PC/EP	Dr. J. Bohnenberger Dr. Andrew Parker

European Patent Application No. 08837186.9-1524
„FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL"
ADC Telecommunications, Inc.

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Dear Sirs,

In connection with the above referenced case we request an extension of two months expiring by

October 11, 2011

in order to deal with the objections raised by the Examiner. The necessary information could not yet be obtained from our client. Accordingly, we request that this extension of time be granted.

Yours faithfully,

Dr. Johannes Bohnenberger
European Patent Attorney

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Date: 09.08.11

Reference	Application No./Patent No.
M/MGD-354-PC/EP	08837186.9 - 1524 / 2176696

Applicant/Proprietor
ADC Telecommunications, INC.

Extension of time limit pursuant to Rule 132(2) EPC

Examination procedure

With reference to your request, the time limit for replying to the communication pursuant to Article 94(3) EPC dated 01.04.11 has been extended

by 2 months

to a total of 6 months

from the date of notification of the above-mentioned communication.

Please note: To the extent that your request exceeded the above extension, your request has been refused.

Note
The granting of extensions to time limits is governed by the Implementing Regulations to the EPC and the Guidelines for Examination in the EPO, part E-VIII, 1.6. A request for extension, which would result in the total period set exceeding six months, must be reasoned and supported by evidence.

If no reply to the communication is received in due time, the European patent application will be deemed to be withdrawn (Art. 94(4) EPC).

For the Examining Division

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11. Okt. 2011

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October 11, 2011 BO/PA/kad/zf	08837186.9-1524	M/MGD-354-PC/EP	Dr. J. Bohnenberger Dr. Andrew Parker

European Patent Application No. 08837186.9-1524
ADC Telecommunications, Inc.

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Dear Sirs,

In response to the Official Communication of April 1, 2011.

We request that examination be continued on the basis of the following documents:

- claims 1-15 as enclosed;
- description page 1 as enclosed;
- description page 1a to be inserted accordingly, as enclosed;
- description pages 2-11 as originally filed; as well as
- drawing sheets 1/14 to 14/14 as originally filed.

The Examiner will note that the Applicant has chosen to file an amended set of claims 1-15 that is based on original claims 1-15, filed with letter of April 23, 2010, as discussed herein below. These claims replace the claims presently on file. A marked-up copy of the claims is enclosed for the Examiner's convenience.

Support for the amendments are presented in the following remarks.

Remarks:

1. Amendment to the claims and support therefor

1.1 Amended claim 1 is based on claim 1 presently on file although the amendments hereinbelow have been made.

1.1.1 Reference signs according to R. 43(7) EPC have been inserted.

1.1.2 The feature "*a cable manager disposed on an axial end of the cable spool*" has been deleted. This feature does not provide a technical contribution to the subject-matter of the claimed invention and does not interact with the remaining features in the claim such that it influences the solution of the technical problem. Hence, this amendment does not contravene Art. 123(2) EPC. Furthermore, this feature was not part of original claim 1.

1.1.3 The feature "*the housing (23; 123) includes a port (136) allowing a second fiber optic cable having connectorized ends connected to the termination module (45; 149) in the interior region (33; 130) of the housing (23; 123) to exit*" has been added. Support for this amendment is found on page 11, lines 5-9 and in Fig. 12 of the application as published.

1.1.4 The amended claim 1 has been recast into a preamble and a characterizing portion in accordance with R. 43(1) EPC. To this end, the preamble is based on D1.

1.2 Independent claim 7 has been recast into a preamble and a characterizing portion in accordance with R. 43(1) EPC, wherein the preamble is based on D1.

1.3 Dependent claims 6 and 15 have been amended to include a definition of a cable manager. Support is found in old claim 1.

1.4 In dependent claims 8-14, the dependencies have been corrected. Support is found in the marked-up copy of the voluntary claim amendments as filed on April 26, 2010.

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1.5 As may be realized from the above, the amendments made are supported by the application as filed and thus are in accordance with Art. 123(2) EPC.

2. Novelty

2.1 The Applicant submits that amended claim 1 is novel in view of D1.

2.2 D1 relates to a cable storage device which has a reel rotatably mounted in a frame. A connector panel for connecting fiber optic cables fits on the reel for rotation with the reel. When lines leading to equipment are to be connected to the connector panel, the connector panel has to be moved to a docking station on the reel.

2.3 As such, the Applicant respectfully submits that D1 fails to disclose that the housing includes a port allowing a second fiber optic cable to have access to the termination module. Consequently, D1 fails to disclose the features of the amended claim 1 that the claimed assembly comprises a housing wherein the housing includes a port allowing a second fiber optic cable having connectorized ends connected to the termination module in the interior region of the housing to exit.

2.4 In view of the above, it is concluded that amended claim 1 is novel in view of document D1 cited by the Examiner.

3. Inventive step

3.1 D1 is regarded as constituting the closest prior art with respect to amended claim 1 and claim 7, as defined by the Examiner and is considered to constitute the most promising starting point.

3.2 As should be appreciated from the above conclusions relating to the novelty of amended claim 1, D1 does not disclose the characterizing portion of claim 1; in particular the feature that the housing includes a port through which a second fiber optic cable can access the interior region of the housing to connect to the termination module. In contrast, D1 discloses that the connector panel must be

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moved to a docking station on the frame of the cable storage device. The connector panel is provided with push-pull fasteners that releasably engage either holes of the frame docking station or holes of the reel docking station.

3.3 The effect of the features of the characterizing portion of amended claim 1 is that the claimed assembly provides a robust fiber optic enclosure having a securely fastened termination module, wherein the fasteners securing the termination module to the cable spool do not have a risk of wearing out. Also, time is saved when the termination module does not have to be moved.

3.4 As such, the objective technical problem may be formulated as how to obtain a robust fiber optic enclosure having a securely fastened termination module wherein the fasteners securing the termination module to the cable spool are not at risk of wearing out.

3.5 A person skilled in the art would be taught from D1 that the connector panel must be moved when connecting lines leading to equipments, see col. 4, lines 55-60.

3.6 Thus, the skilled person, starting from D1 and striving to solve the objective technical problem, would simply improve the fasteners.

3.7 In contrast to the steps that the skilled person would take in an attempt to solve the objective technical problem, the inventors of the present invention have realized that by providing a port in the housing, the fiber optic leading to equipments may enter the housing and be connected to the termination module without moving the termination module.

3.8 With the solution as proposed by the inventors of the present invention, a robust fiber optic enclosure is provided which has a securely fastened termination module wherein the fasteners securing the termination module to the cable spool do not run the risk of wearing out. Also, time saving is obtained since the termination module does not have to be moved.

3.9 The same arguments for inventive step apply to independent claim 7.

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3.10 To summarize, a person skilled in the art, starting from D1 and striving to solve the objective technical problem, would not arrive at the assembly and method as claimed in independent claims 1 and 7 respectively. Thus, the Applicant respectfully submits that amended claim 1 and claim 7 involve the required inventive step in view of the documents cited by the Examiner. Claims 1 and 7, therefore, meet the requirements of Art. 56 EPC. Claims 2-6 and 8-15 ultimately depend from either of these claims and therefore also meet the requirement of Art. 56 EPC for at least the same reason as amended claim 1 and claim 7.

4. Conclusion

4.1 As it is believed that all of the objections raised by the Examiner have been overcome, the Applicant believes that the application is now in a position to grant. Should the Examiner care to raise further questions or comments, we would be delighted for the Examiner to contact the undersigning attorney directly to discuss the application and/or to arrange for a personal consultation. If the Examiner considers it appropriate, we would also be happy to receive a positive proposal of amendments in this file, so as to expedite the Examination Proceedings.

4.2. Oral Proceedings in accordance with Art. 116 EPC are requested as a matter of precaution only.

Respectfully submitted,

Dr. Johannes Bohnenberger
European Patent Attorney

Enclosures:
- New Claims 1-15
- Marked-up Claims
- Description pages 1 and 1a

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FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

Cross-Reference to Related Application

This application is being filed on 05 August 2008, as a PCT International Patent application in the name of ADC Telecommunications, Inc., a U.S. national corporation, applicant for the designation of all countries except the U.S., and Scott C. KOWALCZYK, a citizen of the U.S., Jonathan Walter COAN, a citizen of the U.S., and Jonathan KAML, a citizen of the U.S., applicants for the designation of the U.S. only, and claims priority to U.S. Provisional Patent Application Serial No. 60/954,214 filed on 06 August 2007, U.S. Provisional Patent Application Serial No. 61/029,248 filed on 15 February 2008, and U.S. Utility Patent Application Serial No. 12/182,705 filed on 30 July 2008.

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. <Insert page 1a>

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

DESCRIPTION

One prior art approach is disclosed in US 6 220 413, which shows a cable storage device which has a reel rotatably mounted in a frame. A connector panel for connecting fiber optic cables fits on the reel for rotation with the reel. When lines leading to an equipment are to be connected to the connector panel, the connector panel is moved to a docking station on the reel.

IPR2025-01119
Belden EX1010

CLAIMS

1. A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing (23; 123) having an interior region (33; 130);

a bearing mount (71) disposed in the interior region (33; 130) of the housing (23; 123);

a cable spool (37; 137) engaged with the bearing mount (71) such that the cable spool (37; 137) selectively rotates within the housing (23; 123);

a termination module (45; 149) disposed on the cable spool (37) so that the termination module (45; 149) rotates in unison with the cable spool (37); and

a first fiber optic cable (22; 122) wrapped about a spooling portion of the cable spool (37), the first fiber optic cable (22; 122) having connectorized ends (146) that are routed to the termination module (45; 149);

characterized in that the housing (23; 123) includes a port (136) allowing a second fiber optic cable having connectorized ends connected to the termination module (45; 149) in the interior region (33; 130) of the housing (23; 123) to exit.

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 the axial end of the cable spool defines a cable passage.

6. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that is a cable management spool.

7. A method of paying out a fiber optic cable from a fiber optic enclosure, comprising:

providing a fiber optic enclosure including:

a housing defining an interior region;

a cable spool disposed in the interior region, the cable spool having a spooling portion;

a termination module disposed on the cable spool;

a first fiber optic cable coiled around the spooling portion of the cable spool, the first fiber optic cable including connectorized ends that are engaged with the termination module;

rotating the cable spool about an axis of the housing of the fiber optic enclosure until a desired length of the first fiber optic cable is paid out **characterized by**

connecting a connectorized end of a second fiber optic cable to the termination module in the interior region of the fiber optic enclosure.

8. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 7, wherein the termination module includes a plurality of adapters.

9. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the termination module includes an adapter plate having an adapter slot with the plurality of adapters engaged with the adapter slot.

10. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, where the termination module includes a plurality of sliding adapter modules.

11. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 7, wherein the connectorized ends of a first end of the first fiber optic cable are connected to adapters disposed in the termination module.

12. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 7, wherein the housing is mounted to a wall.

13. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 7, further comprising fixing the position of the cable spool with respect to the housing when the desired length of the first fiber optic cable has been paid out.

14. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 13, wherein a pin fixes the position of the cable spool with respect to the housing.

15. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that includes an outer radius that is larger than a minimum bend radius of the fiber optic cable.

MARKED-UP CLAIMS

1. A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing (23; 123) having an interior region (33; 130);

a bearing mount (71) disposed in the interior region (33; 130) of the housing (23; 123);

a cable spool (37; 137) engaged with the bearing mount (71) such that the cable spool (37; 137) selectively rotates within the housing (23; 123);

a termination module (45; 149) disposed on the cable spool (37) so that the termination module (45; 149) rotates in unison with the cable spool (37); and

~~a cable manager disposed on an axial end of the cable spool; and~~

a first fiber optic cable (22; 122) wrapped about a spooling portion of the cable spool (37), the first fiber optic cable (22; 122) having connectorized ends (146) that are routed to the termination module (45; 149);

characterized in that the housing (23; 123) includes a port (136) allowing a second fiber optic cable having connectorized ends connected to the termination module (45; 149) in the interior region (33; 130) of the housing (23; 123) to exit.

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 the axial end of the cable spool defines a cable passage.

6. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that is a cable management spool.

7. A method of paying out a fiber optic cable from a fiber optic enclosure, comprising:

providing a fiber optic enclosure including:

a housing defining an interior region;

a cable spool disposed in the interior region, the cable spool having a spooling portion;

a termination module disposed on the cable spool;

a first fiber optic cable coiled around the spooling portion of the cable spool, the first fiber optic cable including connectorized ends that are engaged with the termination module;

rotating the cable spool about an axis of the housing of the fiber optic enclosure until a desired length of the first fiber optic cable is paid out~~; and~~ **characterized by**

connecting a connectorized end of a second fiber optic cable to the termination module in the interior region of the fiber optic enclosure.

8. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 7 ~~8~~, wherein the termination module includes a plurality of adapters.

9. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~10~~, wherein the termination module includes an adapter plate having an adapter slot with the plurality of adapters engaged with the adapter slot.

10. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~10~~, where the termination module includes a plurality of sliding adapter modules.

11. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 7 ~~8~~, wherein the connectorized ends of a first end of the first fiber optic cable are connected to adapters disposed in the termination module.

12. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 7 ~~8~~, wherein the housing is mounted to a wall.

13. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 7 ~~8~~, further comprising fixing the position of the cable spool with respect to the housing when the desired length of the first fiber optic cable has been paid out.

14. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 13 ~~16~~, wherein a pin fixes the position of the cable spool with respect to the housing.

15. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that includes

an outer radius that is larger than a minimum bend radius of the fiber optic cable.

5

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Application No.	Ref.	Date
08 837 186.9 - 1524	M/MGD-354-PC/EP	23.07.2012
Applicant: ADC Telecommunications, INC.		

Communication pursuant to Article 94(3) EPC

The examination of the above-identified application has revealed that it does not meet the requirements of the European Patent Convention for the reasons enclosed herewith. If the deficiencies indicated are not rectified the application may be refused pursuant to Article 97(2) EPC.

You are invited to file your observations and insofar as the deficiencies are such as to be rectifiable, to correct the indicated deficiencies within a period

of 4 months

from the notification of this communication, this period being computed in accordance with Rules 126(2) and 131(2) and (4) EPC. One set of amendments to the description, claims and drawings is to be filed within the said period on separate sheets (R. 50(1) EPC).

If filing amendments, you must identify them and indicate the basis for them in the application as filed. Failure to meet either requirement may lead to a communication from the Examining Division requesting that you correct this deficiency (R. 137(4) EPC).

Failure to comply with this invitation in due time will result in the application being deemed to be withdrawn (Art. 94(4) EPC).

Registered Letter

IPR2025-01119
Belden EX1010

Verdrager, Véronique
Primary Examiner
For the Examining Division

Enclosure(s): 3 page/s reasons (Form 2906)

Registered Letter

IPR2025-01119
Page 240 of 412
Belden EX1010

The examination is being carried out on the **following application documents**

Description, Pages

2-11	as published			
1, 1a	received on	11-10-2011	with letter of	11-10-2011

Claims, Numbers

1-15	received on	11-10-2011	with letter of	11-10-2011

Drawings, Sheets

1/14-14/14	as published

1. Novelty

1.1 The present application does not meet the requirements of Article 52(1) EPC, because the subject-matter of claims 1 and 6 is not new in the sense of Article 54(1) and (2) EPC.

1.2 Document D1 discloses a fiber optic enclosure assembly for enclosing optical fiber connections (figures 1,5; column 2, line 6 - column 3, line 15) comprising:

a housing (27) having an interior region;

a bearing mount (41) disposed in the interior region of the housing;

a cable spool (11) engaged with the bearing mount such that the cable spool (11) selectively rotates within the housing (column 2, lines 41-47);

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

a first fiber optic cable (figure 2: (23); column 3, lines 13-15) wrapped about a spooling portion of the cable spool, the fiber optic cable having connectorized ends that are routed to the termination module (47,53) (figure 5; column 3, lines 13-15);

wherein the housing (27) includes a port (figure 5: (43)) allowing a second fiber optic cable having connectorized ends connected to the termination module in the interior region of the housing to exit.

The subject-matter of claim 1 is therefore not new.

1.3 D1 discloses the additional features introduced by dependent claim 6 (cable management spool) in column 2, lines 14-22.

2. Inventive step

2.1 The present application does not meet the requirements of Article 52(1) EPC because the subject-matter of claims 2-5,7-15 does not involve an inventive step within the meaning of Article 56 EPC.

2.2 Independent claim 7 defines a method of paying out a fiber optic cable from a fiber optic enclosure as defined in claim 1. A method of paying out a fiber optic cable is described in D1 (column 4, lines 32-61). D1 discloses that "when rotation is desired, connector panel 53 must be moved to the position shown in FIG. 5 on reel docking station 47. In this position, reel 11 may be rotated to extend or retract cable 23. When placed in this position, lines 59 (FIG. 6) must first be removed from connector sleeves 55." (column 3, lines 19-24). This is in order to avoid damaging cable (23). The feature of connecting a connectorized end of a second fiber optic cable to the termination module in the **interior** region of the fiber optic enclosure is merely one of several straightforward possibilities which the skilled person would select, depending on the circumstances, without exercising inventive skill, in order to solve the problem posed. A skilled person would understand that once the subscriber cable has been paid out, and the cable spool is fixed in position relative to the housing, there is no danger anymore of damaging cable (23), and thus connecting a connectorized end of a second fiber optic cable to the termination module on connector panel (53) attached to reel docking station (47) (figure 5) is a straightforward possibility. It is an obvious alternative to removing connector panel (53) from reel docking station (47) and mount it to frame docking station (43) as shown in figure 6, where the lines (59) are then connected (column 4, lines 56-60).

Consequently, the subject-matter of claim 7 appears to lack an inventive step.

2.3 D1 discloses the additional features introduced by following dependent claims:

- claims 8,11 (connected plurality of adapters): figure 5, (55); column 2, lines 57 - column 3, line 5;

- claims 13,14 (fixing the spool with a pin): column 3, lines 25-33.

2.4 The features of claims 2,3,4,9,10 (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).

2.5 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).

2.6 The feature of claim 12 (housing mounted to a wall) is merely one 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.

2.7 It would be obvious for the skilled person to choose for a cable management spool (D1: column 2, lines 14-22) an outer radius that is larger than a minimum bend radius of the fiber optical cable. Thus the subject-matter of claim 15 appears to lack an inventive step.

3. Formal aspects

3.1 Reference signs placed in parentheses should be inserted in all claims (Rule 43 (7) EPC).

3.2 The applicant is requested to bring the description into conformity with the new claims (to adapt the summary of the invention and to delete embodiments not falling under the new independent claim), and to reason the inventive step of the independent claim in terms of the problem and its solution.

3.3 In order to facilitate the examination of the conformity of the amended application with the requirements of Article 123(2) EPC, the applicant is requested to clearly identify the amendments carried out, irrespective of 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.

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.

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29. Nov. 2012

Datum Date	Ihr Zeichen Your ref.	Unser Zeichen Our ref.	Ihr Ansprechpartner Your contact
November 29, 2012 BO/BM/cd/gp	08837186.9-1524	M/MGD-354-PC/EP	Dr. J. Bohnenberger Martin Bicker

European Patent Application No. 08837186.9-1524
"FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL"
ADC Telecommunications, Inc.

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Dear Sirs,

In response to the Official Communication of July 23, 2012.

We request that examination be continued on the basis of the following documents:

- claims 1-15 as enclosed;
- description pages 1 and 1a as filed October 11, 2011;
- description pages 2-11 as originally filed; as well as
- drawing sheets 1/14 to 14/14 as originally filed.

The Examiner will note that the Applicant has chosen to file an amended set of claims 1-15 that is based on claims 1-15 as filed October 11, 2011, and discussed herein below. These claims replace the claims presently on file. A marked-up copy of the claims is enclosed for the Examiner's convenience.

Support for the amendments can be found as follows:

New claims 1-6	Claims 1-6 of October 11, 2011

New claim 7	Claim 15 of October 11, 2011
New claims 8-15	Claims 7-14 of October 11, 2011

Remarks:

1. In essence, the Examiner has not accepted the previous argumentation and amendments provided in this application, and insists that document D1 discloses the subject matter in claim 1 and that claim 7 cannot be considered inventive over D1. To this end, the Applicant respectfully disagrees with the Examiner's assertions. As the previous sections of the corresponding claims have already been discussed, this letter will focus primarily upon the amendments made in the previous submission to the EPO and comments associated therewith. The Examiner will note that the claims now include reference numerals throughout, and claim 15 has been renumbered as claim 7, so as to present all apparatus claims (1-6 and 15) together and all method claims (7-14) together.

2. The previous amendment to claim 1, filed October 11, 2011, primarily details the inclusion of a port allowing for a second fiber optic cable to be routed through, and thus exit, the housing. It is readily apparent that there are two cables present in the present application; the first of which may be considered as the subscriber cable (Fig. 14, 122). Said cable is routed through a port (131) to exit the housing, and is also wrapped around the cable spool (137) and split into individual fibers (124) with each fiber being connected to the adapter plate (149). Using this nomenclature, the second cable is evidently the plurality of cables entering the housing and denoted as the second subscriber cable (126).

3. Claim 1 describes the first and second cables – the first is defined as being wrapped around the cable spool, the second is defined as exiting the housing. Therefore, the port that is discussed in claim 1 is obviously the port for the plurality of cables, i.e., the second cables and not the first cables.

4. Turning to the prior art, it would appear that this feature of the port is present for the equivalent cables of the first cables of the present application. For the equivalent cable to the first cable (122), it is noted that D1 provides an access port (D1, 35) in communication with reel (D1, 11) via channel (D1, 39), as is shown in Fig. 1. This

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access port allows for "the passage of the fiber optic cable 23" (D1, Col. 2, lines 29-31), wherein the cable (D1, 23) wraps around the reel (D1, Col. 2, lines 20-22). In other words, this access port may be considered as equivalent to port (131) of Fig. 15.

5. The D1 equivalent to the second cables may, therefore, be considered as the lines (D1, 59) which are connected to connectors (D1, 55). That is, these lines are connected to the connector and are directed away from the housing. However, one difference between claim 1 and the prior art document D1 is the specification of the second fiber optic cables being located in the interior region of the housing. Therefore, in contrast to the Examiner's comments, claim 1 is novel over D1.

6. The device of D1 operates in a similar way to that of the present invention, whereby a cable is wrapped around a reel which possesses a terminal section, connector panel (D1, 53), for connection of a fanned-out end of said cable. Therefore, when the unattached end of the first cable is extended from the housing of the device of D1, the reel rotates in unison with the connector panel. When fully extended, or extended to the required length, the reel is locked and the connector panel is moved from the reel to an external section of the housing. The second cable, or lines (D1, 59), are then connected to the connector panel which is effectively externally mounted at this time.

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7. In contrast to the Examiner's comments, the device of D1 may not be modified to recite the device of claim 1. For example, one problem to be solved by the present application may be to reduce the exposure of the connections to the outside environment (the device may be exposed to the weather, i.e., positioned in an outside environment). However, if D1 is to solve the same problem, then one skilled in the art would not seek to position the connection of the cables internally to the device. Indeed, one skilled in the art is always taught to move the connector panel to the exterior surface (D1, Fig. 6) of D1, thus the connections of the second cable are always at an exterior surface of D1.

8. However, in contrast to the Examiner's comments in relation to claim 7, it is not an obvious step for one skilled in the art to simply not move the connector panel (D1, 53) from the reel docking station (D1, 47). In other words, one skilled in the art would not connect the second cables to the connector panel whilst mounted to the reel docking station.

9. As indicated in Fig. 5 of D1, the connector panel is mounted on top of the reel (D1, 11) and rotates in unison with the extension of the first cable. As indicted by numeral 41 of Fig. 5 of D1, one can immediately see a protrusion arising from the top surface of the reel. Such a protrusion is described as the rod and is detailed as extending "from the axis of hub 13 for rotation with reel 11. Rod 41 has flat sides for receiving a conventional socket" (D1, Col. 2, lines 41-45). Clearly, therefore, the extension of the rod from the surface of the reel is an important feature of the design of the device of D1.

10. As can be seen from Fig. 5, the rod extends from the central axis of the reel, while the connector panel is off-centred. Therefore, one can see that the second cables could not possibly be connected to the connector panel, while the connector panel remains on the reel, as several of the connection members are blocked by the protruding rod. One skilled in the art would therefore not seek to attach cables without moving the connector panel to an exterior of the housing of D1. In addition, the connector panel cannot be mounted in any other position to allow for such a connection of the second cables. Moreover, attempting to route the cables to traverse the rod would, more than likely, lead to a bending of the cables beyond the maximum bending radius.

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11. Quite clearly, one skilled in the art would not be motivated to alter the connection aspect of D1. Given the problem highlighted above, if one skilled in the art were to attempt to solve such a problem then, starting from D1, one skilled in the art would seek an alternative solution to the one that is utilised in the present application. In addition, D1 does not discuss the minimum bend radii of the second cables, which would also be a consideration when attaching the second cables to the connector panel in D1. Given that the rotation of the reel in D1 is not limited, this could lead to large amounts of bending of the connected lines (D1, 59) for certain angles of the reel if the connector panel were to remain fixed to the top surface of the reel. Thus, one skilled in the art would also not immediately consider connecting the second cables to the connector panel affixed to the reel for this reason as well.

12. The Applicant is well aware that the description is not yet in line with the new claims. The description will, of course, be adapted in the appropriate manner once an allowable version of the claims has been found. It is requested that at present, in the

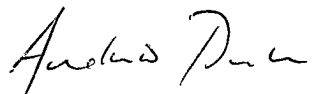
interests of expediency, revision of the description is postponed in order to avoid the unnecessary recasting of pages.

In the circumstances, the Examiner is asked to reconsider the outstanding objections and to acknowledge the patentability of the new claims in principle. The Applicant is, of course, readily prepared to make further clarifications to the application documents, if necessary.

Should the Examiner care to raise further questions or comments, we would be delighted for the Examiner to contact the undersigning attorney directly to discuss the application and/or to arrange for a **personal consultation**. If the Examiner considers it appropriate, we would also be happy to receive a positive proposal of amendments in this file, so as to expedite the Examination Proceedings.

13. Oral Proceedings are requested in this application as a matter of precaution only.

Respectfully submitted,



Dr. Andrew Parker
European Patent Attorney

Encl.
- New claims 1 to 15
- Marked-up copy of claims

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CLAIMS – CLEAN

1. A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing (23; 123) having an interior region (33; 130);

a bearing mount (71) disposed in the interior region (33; 130) of the housing (23; 123);

a cable spool (37; 137) engaged with the bearing mount (71) such that the cable spool (37; 137) selectively rotates within the housing (23; 123);

a termination module (45; 149) disposed on the cable spool (37) so that the termination module (45; 149) rotates in unison with the cable spool (37); and

a first fiber optic cable (22; 122) wrapped about a spooling portion of the cable spool (37), the first fiber optic cable (22; 122) having connectorized ends (146) that are routed to the termination module (45; 149);

characterized in that the housing (23; 123) includes a port (136) allowing a second fiber optic cable having connectorized ends connected to the termination module (45; 149) in the interior region (33; 130) of the housing (23; 123) to exit.

2. A fiber optic enclosure assembly as claimed in claim 1, wherein a needle bearing is disposed on an outer surface (73) of the bearing mount (71).

3. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an

adapter slot (55) with a plurality of adapters (401) engaged with the adapter slot (55).

4. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes a plurality of sliding adapter modules.

5. A fiber optic enclosure assembly as claimed in claim 1, wherein the axial end (41; 136) of the cable spool (37; 137) defines a cable passage (63).

6. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that is a cable management spool (61; 161).

7. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that includes an outer radius that is larger than a minimum bend radius of the fiber optic cable.

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

providing a fiber optic enclosure including:

a housing (23; 123) defining an interior region (33; 130);

a cable spool (37; 137) disposed in the interior region (33; 130), the cable spool (37; 137) having a spooling portion (39);

a termination module (45; 149) disposed on the cable spool (37; 137);

a first fiber optic cable (22; 122) coiled around the spooling portion (39) of the cable spool (37; 137), the first fiber optic cable (22; 122) including connectorized ends (146) that are engaged with the termination module (45; 149);

rotating the cable spool (37; 137) about an axis of the housing (23; 123) of the fiber optic enclosure until a desired length of the first fiber optic cable (22; 122) is paid out

characterized by

connecting a connectorized end of a second fiber optic cable to the termination module (45; 149) in the interior region (33; 130) of the fiber optic enclosure.

9. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the termination module (45; 149) includes a plurality of adapters (401).

10. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with the plurality of adapters (401) engaged with the adapter slot (55).

11. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9, where the termination module (45; 149) includes a plurality of sliding adapter modules.

12. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the connectorized ends (146) of a first end of the first fiber optic cable (22; 122) are connected to adapters (401) disposed in the termination module (45; 149).

13. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the housing (23; 123) is mounted to a wall.

14. 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

(37; 137) with respect to the housing (23; 123) when the desired length of the first fiber optic cable (22; 122) has been paid out.

15. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 14, wherein a pin fixes the position of the cable spool (37; 137) with respect to the housing (23; 123).

NEW CLAIMS (MARKED-UP)

1. A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing (23; 123) having an interior region (33; 130);

a bearing mount (71) disposed in the interior region (33; 130) of the housing (23; 123);

a cable spool (37; 137) engaged with the bearing mount (71) such that the cable spool (37; 137) selectively rotates within the housing (23; 123);

a termination module (45; 149) disposed on the cable spool (37) so that the termination module (45; 149) rotates in unison with the cable spool (37); and

a first fiber optic cable (22; 122) wrapped about a spooling portion of the cable spool (37), the first fiber optic cable (22; 122) having connectorized ends (146) that are routed to the termination module (45; 149);

characterized in that the housing (23; 123) includes a port (136) allowing a second fiber optic cable having connectorized ends connected to the termination module (45; 149) in the interior region (33; 130) of the housing (23; 123) to exit.

2. A fiber optic enclosure assembly as claimed in claim 1, wherein a needle bearing is disposed on an outer surface (73) of the bearing mount (71).

3. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes an adapter plate (47; 149) having

an adapter slot (55) with a plurality of adapters (401) engaged with the adapter slot (55).

4. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes a plurality of sliding adapter modules.

5. A fiber optic enclosure assembly as claimed in claim 1, wherein the axial end (41; 136) of the cable spool (37; 137) defines a cable passage (63).

6. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that is a cable management spool (61; 161).

8 ~~7~~.A method of paying out a fiber optic cable from a fiber optic enclosure, comprising:

providing a fiber optic enclosure including:

a housing (23; 123) defining an interior region (33; 130);

a cable spool (37; 137) disposed in the interior region (33; 130), the cable spool (37; 137) having a spooling portion (39);

a termination module (45; 149) disposed on the cable spool (37; 137);

a first fiber optic cable (22; 122) coiled around the spooling portion (39) of the cable spool (37; 137), the first fiber optic cable (22; 122) including connectorized ends (146) that are engaged with the termination module (45; 149);

rotating the cable spool (37; 137) about an axis of the housing (23; 123) of the fiber optic enclosure until a desired length of the first fiber optic cable (22; 122) is paid out

characterized by

connecting a connectorized end of a second fiber optic cable to the termination module (45; 149) in the interior region (33; 130) of the fiber optic enclosure.

9 ~~8~~.A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the termination module (45; 149) includes a plurality of adapters (401).

10 ~~9~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9 ~~8~~, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with the plurality of adapters (401) engaged with the adapter slot (55).

11 ~~10~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9 ~~8~~, where the termination module (45; 149) includes a plurality of sliding adapter modules.

12 ~~11~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the connectorized ends (146) of a first end of the first fiber optic cable (22; 122) are connected to adapters (401) disposed in the termination module (45; 149).

13 ~~12~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the housing (23; 123) is mounted to a wall.

14 ~~13~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, further comprising fixing the position of the cable spool (37; 137) with respect to the housing (23; 123) when the desired length of the first fiber optic cable (22; 122) has been paid out.

15 ~~14~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 14 ~~13~~, wherein a pin fixes the position of the cable spool (37; 137) with respect to the housing (23; 123).

7 ~~15~~. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that includes an outer radius that is larger than a minimum bend radius of the fiber optic cable.

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Application No.: 08 837 186.9

Preparation for oral proceedings - Instructions to Support Service

Oral proceedings are to be held in connection with the above patent application

1. The matters to be discussed are set out in the annex (Form 2906)

2. Dispatch the summons using Form 2008/2310 and Form 2906 for the parties to attend on:

Day 26.09.2013 Time 09:30

ROOMS

B000

08. 07. 2013
Room booked

ORAL 01, 02, 03 and 05 coded

08. 07. 2013
Date Initials

2.1 Parties' submissions in preparation for the oral proceedings, if any, should be made no later than

1 month(s)

before the date of the oral proceedings
(transfer to Form 2008.1 / 2310.1)

2.2 Encode ORAL(04)

coded
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Date Initials

2.3 Dispatch Form 2008.7 / 2310.7 to division

08. 07. 2013
Date Initials

3. ☐ Arrange for the following special equipment to be provided in the conference room:

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4. Request language service to provide simultaneous interpretation facilities as necessary

Date Initials

5. Return the dossier to primary examiner after dispatching the summons

08.07.2013
Date Initials

6. Check that summons has been received (Form 2936 / advice of delivery)

7. 15 days before the oral proceedings:
- dispatch the dossier to the primary examiner.

04.07.2013
Date

Andreassen, Jon	Hylla, Winfried	Verdrager, Véronique	
Chairman	2nd examiner	1st examiner	Legal member

Enclosure(s):

Europäisches Patentamt
European Patent Office
Office européen des brevets

European Patent Office
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Meissner, Bolte & Partner GbR
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81633 München
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For any questions about this communication:
Tel.:+31 (0)70 340 45 00

Date
11-07-2013

Reference	Application No./Patent No.
M/MGD-354-PC/EP	08837186.9 - 1504 / 2176696

Applicant/Proprietor
ADC Telecommunications, INC.

Summons to attend oral proceedings pursuant to Rule 115(1) EPC

You are hereby summoned to attend oral proceedings arranged in connection with the above-mentioned European patent application.

The matters to be discussed are set out in the communication accompanying this summons (EPO Form 2906).

The oral proceedings, which will not be public, will take place before the Examining Division.

on 26.09.13 at 09.30 hrs, EPO Dienststelle Berlin, Gitschiner Str. 103, D-10969 Berlin

No changes to the date of the oral proceedings can be made, except on serious grounds (see OJ EPO 1/2009, 68). If you do not appear as summoned, the oral proceedings may continue without you (R. 115(2) EPC, see also OJ EPO 10/2008, 471).

Your attention is drawn to Rule 4 EPC, regarding the language of the oral proceedings, and to the Special edition No. 3 OJ EPO 2007, L.1., concerning the filing of authorisations for company employees and lawyers acting as representatives before the EPO.

The final date for making written submissions and/or amendments (R. 116 EPC) is 26.08.13.

The actual room number as well as the waiting room numbers will be given to you by the porter in the foyer at the EPO.

1st Examiner:	2nd Examiner:	Chairman:
Verdrager V	Hylla W	Andreassen J

For the Examining Division

Annexes:
Confirmation of receipt (Form 2936)
Communication (EPO Form 2906)

Registered letter with advice of delivery
to EPO postal service: 08.07.13
EPO Form 2008 12.12 [ORAL03=B000] (08/07/13)

The examination is being carried out on the **following application documents**

Description, Pages

2-11	as published			
1, 1a	received on	11-10-2011	with letter of	11-10-2011

Claims, Numbers

1-15	received on	29-11-2012	with letter of	29-11-2012

Drawings, Sheets

1/14-14/14	as published

1. State of the procedure:

1.1 The documents on file are the following:

D1 US 6 220 413 B1 (WALTERS MARK D [US] ET AL) 24 April 2001 (2001-04-24)

D2 US 2006/210230 A1 (KLINE JAMES R [US] ET AL) 21 September 2006 (2006-09-21)

D3 EP 1 107 031 A (MOLEX INC [US]) 13 June 2001 (2001-06-13)

D4 US 5 717 810 A (WHEELER TODD A [US]) 10 February 1998 (1998-02-10)

C1: International preliminary report on patentability of the International Searching Authority dated 09.02.2010.

R1: Letter of the Applicant dated 23.04.2010.

C2: Communication under Article 94(3) EPC dated 01.04.2011.

R2: Letter of the Applicant dated 11.10.2011.

C3: Communication Article 94(3) EPC dated 23.07.2012.

R3: Letter of the Applicant dated 29.11.2012.

1.2 Since the examining division is still of the opinion that the claims as presently on file are not allowable, and especially since no considerable progress towards allowable claims has been made, the examining division considers it expedient to summon the applicant to oral proceedings according to Article 116 EPC in accordance with his request filed with the letter of reply R3 dated 29.11.2012.

1.3 It is intended to discuss all outstanding matters in the oral proceedings so that a final conclusion can be reached and a decision be made at the end of the oral proceedings with regard to all requirements of the EPC, in particular novelty (Article 54 EPC), inventive step (Article 56 EPC) and if necessary allowability of amendments (Article 123(2) EPC), disclosure (Article 83 EPC) and clarity (Article 84 EPC).

1.4 Regarding the application at issue and its citations, the provisional and non binding opinion of the examining division to be discussed during the oral proceedings is at present as follows.

2. Novelty

2.1 The present application does not meet the requirements of Article 52(1) EPC, because the subject-matter of claims 1 and 6 is not new in the sense of Article 54(1) and (2) EPC.

2.2 Document D1 discloses a fiber optic enclosure assembly for enclosing optical fiber connections (figures 1,5; column 2, line 6 - column 3, line 15) comprising:

a housing (27) having an interior region;

a bearing mount (41) disposed in the interior region of the housing;

a cable spool (11) engaged with the bearing mount such that the cable spool (11) selectively rotates within the housing (column 2, lines 41-47);

a termination module (figure 5: 47,53) disposed on the cable spool (11) so that the termination module rotates in unison with the cable spool (column 2, lines 53-54);

a first fiber optic cable (figure 2: (23); column 3, lines 13-15) wrapped about a spooling portion of the cable spool, the fiber optic cable having connectorized ends that are routed to the termination module (47,53) (figure 5; column 3, lines 13-15);

wherein the housing (27) includes a port (figure 5: (43)) ***allowing*** a second fiber optic cable having connectorized ends connected to the termination module in the interior region (figure 5: 47,53) of the housing to exit (the fiber optic enclosure of figure 5 allows such a connection).

The subject-matter of claim 1 is therefore not new.

2.3 D1 discloses the additional features introduced by dependent claim 6 (cable management spool) in column 2, lines 14-22.

3. Inventive step

3.1 The present application does not meet the requirements of Article 52(1) EPC because the subject-matter of claims 2-5,7-15 does not involve an inventive step within the meaning of Article 56 EPC.

3.2 Independent claim 8 defines a method of paying out a fiber optic cable from a fiber optic enclosure as defined in claim 1. A method of paying out a fiber optic cable is described in D1 (column 4, lines 32-61). D1 discloses that "when rotation is desired, connector panel 53 must be moved to the position shown in FIG. 5 on reel docking station 47. In this position, reel 11 may be rotated to extend or retract cable 23. When placed in this position, lines 59 (FIG. 6) must first be removed from connector sleeves 55." (column 3, lines 19-24). This is in order to avoid damaging cable (23). The feature of connecting a connectorized end of a second fiber optic cable to the termination module in the **interior** region of the fiber optic enclosure is merely one of two straightforward possibilities which the skilled person would select, depending on the circumstances, without exercising inventive skill, in order to solve the problem posed. Connecting a connectorized end of a second fiber optic cable to the termination module in the **interior** region of the fiber optic enclosure is an obvious alternative to the feature of removing connector panel (53) from reel docking station (47) and mounting it to frame docking station (43) as shown in figure 6, where the lines (59) are then connected (column 4, lines 56-60). A skilled person would understand that once the subscriber cable has been paid out, and the cable spool is fixed in position relative to the housing, there is no danger anymore of damaging cable (23), and thus connecting a connectorized end of a second fiber optic cable to the termination module on connector panel (53) attached to reel docking station (47) (figure 5) is a straightforward possibility. Letting the second cable exit the fiber optic enclosure at port (figure 5: 43) in a side of the housing is then straightforward.

Moreover, a technician not aware of the fact that the connector part can be moved from the reel docking station (47) to the frame docking station (43) would connectorize the end of a second fiber optic cable to the termination module on connector panel (53) attached to reel docking station (47), and let the second cable exit the fiber optic enclosure at port (43) in a side of the housing.

According to the Case Law, the simplification of a complicated technology (D1: displacing connector panel (53)) in situations in which advantages of decreased complexity could reasonably expected to outweigh the resulting loss of performance

(D1: easy access to the connector panel (53) when mounted to the frame docking station (43)) must be considered to be part of the normal work of the person skilled in the art.

Concerning the protrusion (41) in figure 5 of D1, it would be obvious for the skilled person to perform some slight constructional changes in order to avoid the connection members to be blocked or the second cables to be too much bent.

Consequently, the subject-matter of claim 8 appears to lack an inventive step.

3.3 D1 discloses the additional features introduced by following dependent claims:

- claims 9,12 (connected plurality of adapters): figure 5, (55); column 2, lines 57 - column 3, line 5;

- claims 14,15 (fixing the spool with a pin): column 3, lines 25-33.

3.4 The features of claims 2,3,4,10,11 (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).

3.5 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).

3.6 It would be obvious for the skilled person to choose for a cable management spool (D1: column 2, lines 14-22) an outer radius that is larger than a minimum bend radius of the fiber optical cable. Thus the subject-matter of claim 7 appears to lack an inventive step.

3.7 The feature of claim 13 (housing mounted to a wall) is merely one 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.

4. Formal aspects

4.1 The applicant is requested to bring the description into conformity with the new claims (to adapt the summary of the invention and to delete embodiments not falling under the new independent claim), and to reason the inventive step of the independent claim in terms of the problem and its solution.

4.2 In order to facilitate the examination of the conformity of the amended application with the requirements of Article 123(2) EPC, the applicant is requested to clearly identify the amendments carried out, irrespective of 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 (Rule 137(4) EPC).

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.

4.3 Presently, the examining division is inclined to refuse the application under Art. 97(2) EPC. However, the applicant will have a further opportunity to present his arguments during the Oral Proceedings. The applicant's attention is drawn to the Notice from the European Patent Office concerning non- attendance at oral proceedings before the examining division (Official Journal 10/2008, page 471).

4.4 No further submissions in writing appear necessary; however, should the applicant intend to file such submissions, the time limit set according to Rule 116 is to be respected. If amended claims are filed, it will be necessary at the oral proceedings to discuss their admissibility (cf. Rule 137(3) EPC) and subsequently, if these claims are held admissible, the question of whether the amendments, the claims and the claimed subject-matter comply with the requirements of the EPC, in particular Articles 123(2), 84 and 52(1) EPC, respectively.

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Formalities Officer
Name: Schulze, Cornelia
Tel.: 701
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Date: 11-07-2013

Reference	Application No./Patent No.
M/MGD-354-PC/EP	08837186.9 - 1504 / 2176696

Applicant/Proprietor: ADC Telecommunications, INC.

EPA/EPO/OEB Formblatt/Form/Formulaire : 2008/2906

Empfangsbescheinigung über den Zugang des vorstehend bezeichneten Schriftstücks
Acknowledgement of receipt of the document specified above
Récépissé du document spécifié ci-dessus

Unter Bezugnahme auf die Mitteilung im ABl EPA 7/2010, 377 wird gebeten, die Empfangsbescheinigung mit Empfangsdatum und Unterschrift zu versehen und **umgehend** an das EPA zurückzusenden:

With reference to the Notice in OJ EPO 7/2010, 377, you are requested to date and sign the acknowledgement of receipt and return it to the EPO **immediately**:

Conformément au communiqué paru au JO OEB 7/2010, 377, vous êtes prié d'indiquer sur le récépissé la date de réception du document, de signer le récépissé et de le renvoyer **sans délai** à l' OEB:

- **über die Online-Dienste des EPA** (als Anlage zu EPA Form 1038) / **through EPO Online Services** (as annex to EPO Form 1038) / **par les services en ligne de l'OEB** (en tant que pièce jointe au formulaire OEB 1038),
- **per Fax / by fax / par téléfax (+49 (0) 89 2399-4465 or +31 (0) 70 340-3016)**
- oder per Post / or by post / ou par courrier.

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Unterschrift / Signature:

Empfangsberechtigter/authorised recipient/
le destinataire ou la personne dûment mandatée

Rücksende-Adresse / Return address / Adresse de retour
(Umschlag / envelope / enveloppe ISO C4 / DL / C6/C5 / C6)

Europäisches Patentamt
80298 MÜNCHEN
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EPA/EPO/OEB Form 2936 08.10

IPR2025-01119
Belden EX1010
CS30168

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Bohnenberger, Johannes
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EPO - Munich
27
12. Juli 2013

Formalities Officer
Name: Schulze, Cornelia
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Date
11-07-2013

Reference	Application No./Patent No.
M/MGD-354-PC/EP	08837186.9 - 1504 / 2176696
Applicant/Proprietor	
ADC Telecommunications, INC.	

EPA/EPO/OEB Formblatt/Form/Formulaire : 2008/2906

Empfangsbescheinigung über den Zugang des vorstehend bezeichneten Schriftstücks
Acknowledgement of receipt of the document specified above
Récépissé du document spécifié ci-dessus

Unter Bezugnahme auf die Mitteilung im ABl EPA 7/2010, 377 wird gebeten, die Empfangsbescheinigung mit Empfangsdatum und Unterschrift zu versehen und **umgehend** an das EPA zurückzusenden:

With reference to the Notice in OJ EPO 7/2010, 377, you are requested to date and sign the acknowledgement of receipt and return it to the EPO **immediately**:

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- **per Fax / by fax / par téléfax (+49 (0) 89 2399-4465 or +31 (0) 70 340-3016)**
- oder per Post / or by post / ou par courrier.

Empfangen am / Received on / Reçu le :

MEISSNER, BOLTE & PARTNER
ENG.: 12. Juli 2013

Unterschrift / Signature:

Empfangsberechtigter/authorised recipient/
le destinataire ou la personne dûment mandatée

Rücksende-Adresse / Return address / Adresse de retour
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Belden EX1010
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Page 267 of 412

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Datum 12 07 13

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Empfänger der Sendung

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Bohnenberger, Johannes
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ALLEMAGNE

EP 08837186.9 /

1504

Empfangsbestätigung

Name und Vorname in GROSSBUCHSTABEN

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Vorname

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IPR2025-01119
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MEISSNER BOLTE

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Patentanwälte
European Patent Attorneys
European Trademark Attorneys
European Design Attorneys
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www.mbp.de

European Patent Office

80298 München

EPO - Munich
58
17. Juli 2013

Datum Date	Ihr Zeichen Your ref.	Unser Zeichen Our ref.	Ihr Ansprechpartner Your contact
July 16, 2013 BO/PA/kad	08837186.9-1524	M/MGD-354-PC/EP	Dr. J. Bohnenberger Dr. Andrew Parker

European Patent Application No. 08837186.9-1524
"FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL"
ADC Telecommunications, Inc.

ip_law@mbp.®

URGENT

Dear Sirs,

In relation to the Summons to attend Oral Proceedings in the above mentioned application, it is herewith requested that the date be postponed in order to allow the Attorney who is in charge of this file the opportunity to attend the Hearing in Berlin.

As will be seen from the enclosed, I am the Attorney in charge of this file, Andrew Parker of Meissner Bolte & Partner, and am already scheduled to attend a Hearing on September 24, 2013, in The Hague. A further Hearing is scheduled for September 25, 2013, in Munich – wherein this Hearing on September 25, 2013, is an Opposition Hearing and could readily take the entire day.

As can be seen from the above, it is already a difficult schedule for me during this week, and whilst it might be theoretically possible to attend the Hearing in Berlin on the scheduled day, the travel complications and difficulty of getting to Berlin after two days' of Hearings would certainly be very difficult (as well as unreliable, as any flight would need to be scheduled for the morning), which is unfair to the Applicant who would not have an Attorney present functioning to the best of their ability!

It is understood that Meissner Bolte is a large practice with a number of other Attorneys who could attend in my stead; however, I have been responsible for the prosecution in this file and have the best contact with this particular Applicant, and in the interest of ensuring the Applicant has the best representation it would be appreciated if my request for a postponement of the Hearing could be met.

Yours faithfully,

Dr. Andrew Parker
European Patent Attorney

Enclosures:
- Copy of Summons to attend Oral Proceedings in 08154595.6
- Copy of Summons to attend Oral Proceedings in 07854640.5

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MEISSNER, BOLTE & PARTNER
EING.: 31. Mai 2013
21.6.0R
WV 14.09.0R
LT 24.09.013

WV: 23.07.013
LT: 23.08.013

Date
24-05-2013

Reference	Application No./Patent No.
M/OLB-011-EP	08154595.6 - 1857 / 1983681

Applicant/Proprietor
Lockheed Martin Corporation

Summons to attend oral proceedings pursuant to Rule 115(1) EPC

You are hereby summoned to attend oral proceedings arranged in connection with the above-mentioned European patent application.

The matters to be discussed are set out in the communication accompanying this summons (EPO Form 2906).

The oral proceedings, which will not be public, will take place before the Examining Division.

on 24.09.13 at 09.00 hrs, EPO Rijswijk, Rijsvoort, Visseringlaan 19 - 23, NL-2288 ER Rijswijk

No changes to the date of the oral proceedings can be made, except on serious grounds (see OJ EPO 1/2009, 68). If you do not appear as summoned, the oral proceedings may continue without you (R. 115(2) EPC, see also OJ EPO 10/2008, 471).

Your attention is drawn to Rule 4 EPC, regarding the language of the oral proceedings, and to the Special edition No. 3 OJ EPO 2007, L.1., concerning the filing of authorisations for company employees and lawyers acting as representatives before the EPO.

The final date for making written submissions and/or amendments (R. 116 EPC) is 23.08.13.

The actual room number will be given to you by the porter in the foyer at the above EPO address.

1st Examiner:	2nd Examiner:	Chairman:
Clemente Lafuente G	Hegeman J	Heinrich D

For the Examining Division

Annexes:
Confirmation of receipt (Form 2936)
Communication (EPO Form 2906)

Europäisches Patentamt • European Patent Office • Office européen des brevets

Lampreia, Sylvia

Registered letter with advice of delivery
to EPO postal service: 13.05.13

EPO Form 2008 12.12 [ORAL03=E000] (13/05/13)

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European Patent Office
Office européen des brevets

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Parker, Andrew James
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MEISSNER, BOLTE & PARTNER
EING.: 10. Juni 2013
21.06.
WV 15.09.013
LT 25.09.013

Schriftsätze: 23.07.013, 23.08.013
Sprache (Admo): 14.07.013, 24.07.013

Date: 07-06-2013

Reference	Application No./Patent No.
M/DMV-027-X OPPO 01	07854640.5 - 1654 / 2083723
Applicant/Proprietor	
Synthes GmbH	

Summons to attend oral proceedings pursuant to Rule 115(1) EPC

You are hereby summoned to attend oral proceedings arranged in connection with the above-mentioned European patent.

The matters to be discussed are set out in the communication accompanying this summons (EPO Form 2906).

The oral proceedings, which will be public, will take place before the opposition division

on 25.09.13 at 09.00 hrs in Room 1654 at the EPO, Grasserstr. 2, PschorrHöfe, D-80335 München

No changes to the date of the oral proceedings can be made, except on serious grounds (see OJ EPO 1/2009, 68). If you do not appear as summoned, the oral proceedings may continue without you (R. 115(2) EPC).

Your attention is drawn to Rule 4 EPC, regarding the language of the oral proceedings, and to the Special edition No. 3 OJ EPO 2007, 128, concerning the filing of authorisations for company employees and lawyers acting as representatives before the EPO.

The final date for making written submissions and/or amendments (R. 116 EPC) is 23.08.13.

You are requested to report in good time beforehand to the porter in the EPO foyer. Room 1601 and 1657 are available as waiting rooms.

Parking is available in the underground car park, accessible only via the entrance "Grasserstrasse 2/6". On presentation of the summons to oral proceedings at the porters' lodge in the main foyer "Bayerstrasse", the parking ticket will be revoked.

1st Examiner:	2nd Examiner:	Chairman:
Storer J	Fernández Arillo J	Buchmann G

For the Opposition Division

Annexes:
Confirmation of receipt (Form 2936)
Rule 4 EPC (EPC Form 2043)
Communication (EPO Form 2906)

Registered letter with advice of delivery
to EPO postal service: 03.06.13

Europäisches Patentamt
European Patent Office
Office européen des brevets

European patent application No. 08837186.9

URGENT !
To be completed (under II.) and returned to the formalities officer immediately

Maintenance / Change of date / Cancellation of oral proceedings arranged for: day 26.09.13 at 09.30 hrs

I. To the Examining / Opposition division

1. ☐ The proprietor has requested the revocation (or the like) of his patent (date: .....).

2. ☒ The party / witness ..... has indicated (date: 19.07.2013.....) that he / she

   - ☒ requests the date / time of oral proceedings to be changed.
   - ☐ withdraws the request for oral proceedings.
   - ☐ will not be attending.
   - ☐ wishes to be heard by a national court.
   - ☐ has filed amendments (in examination proceedings).
   - ☐ has requested that the oral proceedings be held as a videoconference (in examination proceedings).

3. ☐ Two months before the oral proceedings the application is deemed to be withdrawn (in examination proceedings). The oral proceedings have to be cancelled.

19-07-2013
Date

Schulze, Cornelia
Formalities Officer

IPR2025-01119
Belden EX1010
CS30168

European patent application No. 08837186.9

II. To the Formalities Officer

1. ☐ The date / time fixed for oral proceedings is maintained.

☐ (if necessary) The reasons are indicated on enclosed EPO Form 2906/2906O, which is to be dispatched to the party with EPO Form 2008A/2310A.

2. ☐ At the instigation of the division the oral proceedings cannot take place on the arranged date for the reasons indicated on enclosed EPO Form 2906, which is to be dispatched to the party with EPO Form 2008A/2310A.

Date _____ Director (see Internal Instructions IE-III, 1.2) _____

3. ☐ The summons to attend oral proceedings on 26.09.13 should be cancelled.

3.1 ☐ The proceedings will be continued in writing.

3.2 ☐ A new date will be set later.

3.3 ☐ A new date/time is set as follows:

date ..... at ..... hrs.
Parties' written submissions and amendments in preparation for the oral proceedings, if any, should be made not later than

..... month(s) before the date of the oral proceedings.

4. ☐ The request for the oral proceedings to be held as a videoconference

4.1 ☐ is allowed.

4.2 ☐ is rejected for the reasons indicated on enclosed EPO Form 2906, which is to be dispatched to the party with EPO Form 2008A.

5. ☐ The application is deemed to be withdrawn. The oral proceedings are cancelled.

Date _____

Chairman _____ Second member _____ Primary Examiner _____ Legal member _____

III. Action taken by the formalities officer

☐ EPO Form 2008A/2310A has been dispatched, if applicable (see point II above) together with EPO Form 2906/2906O.

☐ A new summons has been dispatched.

☐ .....

Date _____ Formalities Officer _____

IPR2025-01119
Belden EX1010
CS30168

MEISSNER BOLTE

Patentanwälte
European Patent Attorneys
European Trademark Attorneys
European Design Attorneys
Rechtsanwälte
Lawyers

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E-Mail: mail@mbp.de
www.mbp.de

Meissner Bolte & Partner GbR · Postfach/P.O. Box 860624 · D-81633 München

EPO - Munich
81
07. Aug. 2013

European Patent Office

80298 München

Datum Date	Ihr Zeichen Your ref.	Unser Zeichen Our ref.	Ihr Ansprechpartner Your contact
July 16, 2013 BO/PA/kad	08837186.9-1524	M/MGD-354-PC/EP	Dr. J. Bohnenberger Dr. Andrew Parker

European Patent Application No. 08837186.9-1524
"FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL"
ADC Telecommunications, Inc.

- 7. AUG. 2013

ip_law@mbp.®

URGENT

ERINNERUNG
REMINDER

Dear Sirs,

In relation to the Summons to attend Oral Proceedings in the above mentioned application, it is herewith requested that the date be postponed in order to allow the Attorney who is in charge of this file the opportunity to attend the Hearing in Berlin.

As will be seen from the enclosed, I am the Attorney in charge of this file, Andrew Parker of Meissner Bolte & Partner, and am already scheduled to attend a Hearing on September 24, 2013, in The Hague. A further Hearing is scheduled for September 25, 2013, in Munich – wherein this Hearing on September 25, 2013, is an Opposition Hearing and could readily take the entire day.

As can be seen from the above, it is already a difficult schedule for me during this week, and whilst it might be theoretically possible to attend the Hearing in Berlin on the scheduled day, the travel complications and difficulty of getting to Berlin after two days' of Hearings would certainly be very difficult (as well as unreliable, as any flight would need to be scheduled for the morning), which is unfair to the Applicant who would not have an Attorney present functioning to the best of their ability!

It is understood that Meissner Bolte is a large practice with a number of other Attorneys who could attend in my stead; however, I have been responsible for the prosecution in this file and have the best contact with this particular Applicant, and in the interest of ensuring the Applicant has the best representation it would be appreciated if my request for a postponement of the Hearing could be met.

Yours faithfully,

Dr. Andrew Parker
European Patent Attorney

Enclosures:
- Copy of Summons to attend Oral Proceedings in 08154595.6
- Copy of Summons to attend Oral Proceedings in 07854640.5

ip_law@mbp.®

Europäisches Patentamt
European Patent Office
Office européen des brevets

European Patent Office
Postbus 5818
2280 HV RIJSWIJK
NETHERLANDS
Tel. +31 (0)70 340-2040
Fax +31 (0)70 340-3016

For any questions about this communication:
Tel.:+31 (0)70 340 45 00

Popp, Eugen
Meissner, Bolte & Partner GbR
Widenmayerstrasse 48
80538 München
ALLEMAGNE

MEISSNER, BOLTE & PARTNER
EING.: 31. Mai 2013
21.6.02
WV 14.09.02
LT 24.09.013

WV: 23.07.013
LT: 23.08.013

Date
24-05-2013

Reference	Application No./Patent No.
M/OLB-011-EP	08154595.6 - 1857 / 1983681
Applicant/Proprietor	
Lockheed Martin Corporation	

Summons to attend oral proceedings pursuant to Rule 115(1) EPC

You are hereby summoned to attend oral proceedings arranged in connection with the above-mentioned European patent application.

The matters to be discussed are set out in the communication accompanying this summons (EPO Form 2906).

The oral proceedings, which will not be public, will take place before the Examining Division.

on 24.09.13 at 09.00 hrs, EPO Rijswijk, Rijsvoort, Visseringlaan 19 - 23, NL-2288 ER Rijswijk

No changes to the date of the oral proceedings can be made, except on serious grounds (see OJ EPO 1/2009, 68). If you do not appear as summoned, the oral proceedings may continue without you (R. 115(2) EPC, see also OJ EPO 10/2008, 471).

Your attention is drawn to Rule 4 EPC, regarding the language of the oral proceedings, and to the Special edition No. 3 OJ EPO 2007, L.1., concerning the filing of authorisations for company employees and lawyers acting as representatives before the EPO.

The final date for making written submissions and/or amendments (R. 116 EPC) is 23.08.13.

The actual room number will be given to you by the porter in the foyer at the above EPO address.

1st Examiner:
Clemente Lafuente G

2nd Examiner:
Hegeman J

Chairman:
Heinrich D

For the Examining Division

Europäisches Patentamt • European Patent Office • Office européen des brevets

Annexes:
Confirmation of receipt (Form 2936)
Communication (EPO Form 2906)

Registered letter with advice of delivery
EPO Form 2008 12.12 [OBAL03=F0001 (13/05/13)

to EPO postal service: 13.05.13

Europäisches Patentamt
European Patent Office
Office européen des brevets

European Patent Office
80298 MUNICH
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Formalities Officer
Name: Le Bolloch C.
Tel.: 8091
or call:
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Parker, Andrew James
Meissner Bolte & Partner GbR
Widenmayerstraße 48
80538 München
ALLEMAGNE

MEISSNER, BOLTE & PARTNER
ENG.: 10. Juni 2013
21.06.
WV 15.09.013
LT 25.09.013 05

Schriftsätze: 23.07.013 / 23.08.013
Sprache (Adhaw): 14.07.013 / 24.07.013

Date: 07-06-2013

Reference		Application No./Patent No.
M/DMV-027-X	OPPO 01	07854640.5 - 1654 / 2083723
Applicant/Proprietor: Synthes GmbH		

Summons to attend oral proceedings pursuant to Rule 115(1) EPC

You are hereby summoned to attend oral proceedings arranged in connection with the above-mentioned European patent.

The matters to be discussed are set out in the communication accompanying this summons (EPO Form 2906).

The oral proceedings, which will be public, will take place before the opposition division

on 25.09.13 at 09.00 hrs in Room 1654 at the EPO, Grasserstr. 2, PschorrHöfe, D-80335 München

No changes to the date of the oral proceedings can be made, except on serious grounds (see OJ EPO 1/2009, 68). If you do not appear as summoned, the oral proceedings may continue without you (R. 115(2) EPC).

Your attention is drawn to Rule 4 EPC, regarding the language of the oral proceedings, and to the Special edition No. 3 OJ EPO 2007, 128, concerning the filing of authorisations for company employees and lawyers acting as representatives before the EPO.

The final date for making written submissions and/or amendments (R. 116 EPC) is 23.08.13.

You are requested to report in good time beforehand to the porter in the EPO foyer. Room 1601 and 1657 are available as waiting rooms.

Parking is available in the underground car park, accessible only via the entrance "Grasserstrasse 2/6". On presentation of the summons to oral proceedings at the porters' lodge in the main foyer "Bayerstrasse", the parking ticket will be revoked.

1st Examiner:
Storer J

2nd Examiner:
Fernández Arillo J

Chairman:
Buchmann G

For the Opposition Division

Europäisches Patentamt • European Patent Office • Office européen des brevets

Annexes:
Confirmation of receipt (Form 2936)
Rule 4 EPC (EPC Form 2043)
Communication (EPO Form 2906)

Registered letter with advice of delivery
EPO Form 2310 12.12 [ORAL03=1654] (03/06/13)

to EPO postal service: 03.06.13

ORAL4

+498921218670

Europäisches Patentamt
Dienststelle Berlin
16. AUG. 2013

MEISSNER BOLTE

Meissner Bolte & Partner GbR · Postfach/P.O. Box 860624 · D-81633 München

European Patent Office

80298 München

(X) V.V. URGENT (X)

We have yet to receive an answer - Please inform ASAP on this request.

A. Parker

Patentanwälte
European Patent Attorneys
European Trademark Attorneys
European Design Attorneys
Rechtsanwälte
Lawyers

Kanzlei | Office München
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Widenmayerstraße 47
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Tel: +49-(0)89-212186 0
Fax: +49-(0)89-212186 70
E-Mail: mail@mbp.de
www.mbp.de

Datum Date	Ihr Zeichen Your ref.	Unser Zeichen Our ref.	Ihr Ansprechpartner Your contact
July 16, 2013 BO/PA/kad	08837186.9-1524	M/M[illegible]354-PC/EP	Dr. J. Bohnenberger Dr. Andrew Parker

European Patent Application No. 08837186.9-1524
"FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL"
ADC Telecommunications, Inc.

- 7. AUG. 2013

ip_law@mbp.®

URGENT

ERINNERUNG
REMINDER

Dear Sirs,

In relation to the Summons to attend Oral Proceedings in the above mentioned application, it is herewith requested that the date be postponed in order to allow the Attorney who is in charge of this file the opportunity to attend the Hearing in Berlin.

As will be seen from the enclosed, I am the Attorney in charge of this file, Andrew Parker of Meissner Bolte & Partner, and am already scheduled to attend a Hearing on September 24, 2013, in The Hague. A further Hearing is scheduled for September 25, 2013, in Munich – wherein this Hearing on September 25, 2013, is an Opposition Hearing and could readily take the entire day.

As can be seen from the above, it is already a difficult schedule for me during this week, and whilst it might be theoretically possible to attend the Hearing in Berlin on the scheduled day, the travel complications and difficulty of getting to Berlin after two days' of Hearings would certainly be very difficult (as well as unreliable, as any flight would need to be scheduled for the morning), which is unfair to the Applicant who would not have an Attorney present functioning to the best of their ability!

EMPFANGSZEIT 16. AUG. 14:43

Europäisches Patentamt
European Patent Office
Office européen des brevets

European Patent Office
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Fax +49 (0)30 25901 - 840

Bohnenberger, Johannes
Meissner, Bolte & Partner GbR
Postfach 86 06 24
81633 München
ALLEMAGNE

Formalities Officer
Name: Schulze, Cornelia
Tel.: 701
or call:
+31 (0)70 340 45 00

Date: 19-08-2013

Reference	Application No./Patent No.
M/MGD-354-PC/EP	08837186.9 - 1504 / 2176696

Applicant/Proprietor: ADC Telecommunications, INC.

BRIEF COMMUNICATION

Oral Proceedings on 26.09.13

Subject: ☒ Your letter of 17.07.2013

Communication:
- ☒ The summons to attend oral proceedings on 26.09.13 has been cancelled.
- ☐ The procedure will be continued in writing.
- ☐ The date fixed for oral proceedings is maintained.
- ☒ A new date will be set later.
- ☐

Please take note.

For the Examining Division

Europäisches Patentamt • European Patent Office • Office européen des brevets

Europäisches Patentamt
European Patent Office
Office européen des brevets

European patent application No. 08837186.9

URGENT !
To be completed (under II.) and returned to the formalities officer immediately

Maintenance / Change of date / Cancellation of oral proceedings arranged for: day 26.09.13 at 09.30 hrs

I. To the Examining / Opposition division

1. ☐ The proprietor has requested the revocation (or the like) of his patent (date: .....).

2. ☒ The party / witness ..... has indicated (date: 19.07.2013) that he / she

   ☒ requests the date / time of oral proceedings to be changed.

   ☐ withdraws the request for oral proceedings.

   ☐ will not be attending.

   ☐ wishes to be heard by a national court.

   ☐ has filed amendments (in examination proceedings).

   ☐ has requested that the oral proceedings be held as a videoconference (in examination proceedings).

3. ☐ Two months before the oral proceedings the application is deemed to be withdrawn (in examination proceedings). The oral proceedings have to be cancelled.

19-07-2013
Date

Schulze, Cornelia
Formalities Officer

IPR2025-01119
Belden EX1010
CS30168

European patent application No. 08837186.9

II. *To the Formalities Officer*

1. ☐ The date / time fixed for oral proceedings is maintained.

   ☐ (if necessary) The reasons are indicated on enclosed EPO Form 2906/2906O, which is to be dispatched to the party with EPO Form 2008A/2310A.

2. ☐ At the instigation of the division the oral proceedings cannot take place on the arranged date for the reasons indicated on enclosed EPO Form 2906, which is to be dispatched to the party with EPO Form 2008A/2310A.

Date _____ Director (see Internal Instructions IE-III, 1.2) _____

3. ☒ The summons to attend oral proceedings on 26.09.13 should be cancelled.

   3.1 ☐ The proceedings will be continued in writing.

   3.2 ☒ A new date will be set later.

   3.3 ☐ A new date/time is set as follows:

   date ..... at ..... hrs.
   Parties' written submissions and amendments in preparation for the oral proceedings, if any, should be made not later than

   ..... month(s) before the date of the oral proceedings.

4. ☐ *The request for the oral proceedings to be held as a videoconference*

   4.1 ☐ is allowed.

   4.2 ☐ is rejected for the reasons indicated on enclosed EPO Form 2906, which is to be dispatched to the party with EPO Form 2008A.

5. ☐ The application is deemed to be withdrawn. The oral proceedings are cancelled.

Date 19. AUG. 2013

Chairman _____ Second member _____ Primary Examiner i.V. _____ Legal member _____

III. Action taken by the formalities officer

☒ EPO Form 2008A/2310A has been dispatched, if applicable (see point II above) together with EPO Form 2906/2906O.

☐ A new summons has been dispatched.

☐ .....

19.8.13
Date

Schulze
Formalities Officer

IPR2025-01119
Belden EX1010
CS30168

Europäisches Patentamt
European Patent Office
Office européen des brevets

European Patent Office
10958 BERLIN
GERMANY
Tel. +49 (0)30 25901 - 0
Fax +49 (0)30 25901 - 840

For any questions about this communication:
Tel.:+31 (0)70 340 45 00

Bohnenberger, Johannes
Meissner, Bolte & Partner GbR
Postfach 86 06 24
81633 München
ALLEMAGNE

Date: 09-09-2013

Reference	Application No./Patent No.
M/MGD-354-PC/EP	08837186.9 - 1504 / 2176696

Applicant/Proprietor: ADC Telecommunications, INC.

Summons to attend oral proceedings pursuant to Rule 115(1) EPC

You are hereby summoned to attend oral proceedings arranged in connection with the above-mentioned European patent application.

The matters to be discussed are set out in the communication accompanying this summons (EPO Form 2906).

The oral proceedings, which will not be public, will take place before the Examining Division.

on 18.11.13 at 09.30 hrs, EPO Dienststelle Berlin, Gitschiner Str. 103, D-10969 Berlin

No changes to the date of the oral proceedings can be made, except on serious grounds (see OJ EPO 1/2009, 68). If you do not appear as summoned, the oral proceedings may continue without you (R. 115(2) EPC, see also OJ EPO 10/2008, 471).

Your attention is drawn to Rule 4 EPC, regarding the language of the oral proceedings, and to the Special edition No. 3 OJ EPO 2007, L.1., concerning the filing of authorisations for company employees and lawyers acting as representatives before the EPO.

The final date for making written submissions and/or amendments (R. 116 EPC) is 18.10.13.

The actual room number as well as the waiting room numbers will be given to you by the porter in the foyer at the EPO.

1st Examiner:	2nd Examiner:	Chairman:
Verdrager V	Hylla W	Andreassen J

For the Examining Division

Annexes:
Confirmation of receipt (Form 2936)
Communication (EPO Form 2906)

X please refer to the summons dated 11.07.2013

Registered letter with advice of delivery
to EPO postal service: 09.09.13
EPO Form 2008 12.12 [ORAL03=B000] (09/09/13)

European patent application No. 08837186.9

II. *To the Formalities Officer*

1. ☐ The date / time fixed for oral proceedings is maintained.

   ☐ (if necessary) The reasons are indicated on enclosed EPO Form 2906/2906O, which is to be dispatched to the party with EPO Form 2008A/2310A.

2. ☐ At the instigation of the division the oral proceedings cannot take place on the arranged date for the reasons indicated on enclosed EPO Form 2906, which is to be dispatched to the party with EPO Form 2008A/2310A.

   Date _____ Director (see Internal Instructions IE-III, 1.2) _____

3. ☒ The summons to attend oral proceedings on 26.09.13 should be cancelled.

   3.1 ☐ The proceedings will be continued in writing.

   3.2 ☒ A new date will be set later.

   3.3 ☒ A new date/time is set as follows:

   date 18.11.2013 at 9:30 hrs.
   Parties' written submissions and amendments in preparation for the oral proceedings, if any, should be made not later than

   1 month(s) before the date of the oral proceedings.

4. ☐ *The request for the oral proceedings to be held as a videoconference*

   4.1 ☐ is allowed.

   4.2 ☐ is rejected for the reasons indicated on enclosed EPO Form 2906, which is to be dispatched to the party with EPO Form 2008A.

5. ☐ The application is deemed to be withdrawn. The oral proceedings are cancelled.

Date 19. AUG. 2013

F. Rodrigues. _____ i.V. _____ _____

Chairman Second member Primary Examiner Legal member

III. Action taken by the formalities officer

☒ EPO Form 2008A/2310A has been dispatched, if applicable (see point II above) together with EPO Form 2906/2906O.

☒ A new summons has been dispatched.

☐ .....

09.09.2013

19.8.13 09.09.2013 Schulze

Date Formalities Officer

Europäisches Patentamt
European Patent Office
Office européen des brevets

European Patent Office
10958 BERLIN
GERMANY
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Fax +49 (0)30 25901 - 840

Bohnenberger, Johannes
Meissner, Bolte & Partner GbR
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81633 München
ALLEMAGNE

Formalities Officer
Name: Schulze, Cornelia
Tel.: 701
or call:
+31 (0)70 340 45 00

Date: 09-09-2013

Reference	Application No./Patent No.
M/MGD-354-PC/EP	08837186.9 - 1504 / 2176696

Applicant/Proprietor: ADC Telecommunications, INC.

EPA/EPO/OEB Formblatt/Form/Formulaire : 2008

Empfangsbescheinigung über den Zugang des vorstehend bezeichneten Schriftstücks
Acknowledgement of receipt of the document specified above
Récépissé du document spécifié ci-dessus

Unter Bezugnahme auf die Mitteilung im ABl EPA 7/2010, 377 wird gebeten, die Empfangsbescheinigung mit Empfangsdatum und Unterschrift zu versehen und **umgehend** an das EPA zurückzusenden:

With reference to the Notice in OJ EPO 7/2010, 377, you are requested to date and sign the acknowledgement of receipt and return it to the EPO **immediately**:

Conformément au communiqué paru au JO OEB 7/2010, 377, vous êtes prié d'indiquer sur le récépissé la date de réception du document, de signer le récépissé et de le renvoyer **sans délai** à l' OEB:

- **über die Online-Dienste des EPA** (als Anlage zu EPA Form 1038) / **through EPO Online Services** (as annex to EPO Form 1038) / **par les services en ligne de l'OEB** (en tant que pièce jointe au formulaire OEB 1038),
- **per Fax / by fax / par téléfax (+49 (0) 89 2399-4465 or +31 (0) 70 340-3016)**
- oder per Post / or by post / ou par courrier.

Empfangen am / Received on / Reçu le :

Unterschrift / Signature:

Empfangsberechtigter/authorised recipient/
le destinataire ou la personne dûment mandatée

Rücksende-Adresse / Return address / Adresse de retour
(Umschlag / envelope / enveloppe ISO C4 / DL / C6/C5 / C6)

Europäisches Patentamt
80298 MÜNCHEN
DEUTSCHLAND

Rücksende-Adresse / Return address / Adresse de retour

EPA/EPO/OEB Form 2936 08.10

IPR2025-01119
Belden EX1010
CS30168

Europäisches Patentamt
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Office européen des brevets

European Patent Office
10958 BERLIN
GERMANY
Tel. +49 (0)30 25901 - 0
Fax +49 (0)30 25901 - 840

Bohnenberger, Johannes
Meissner, Bolte & Partner GbR
Postfach 86 06 24
81633 München
ALLEMAGNE

EPO - Munich
27
10. Sep. 2013

Formalities Officer
Name: Schulze, Cornelia
Tel.: 701
or call:
+31 (0)70 340 45 00

Date
09-09-2013

Reference	Application No./Patent No.
M/MGD-354-PC/EP	08837186.9 - 1504 / 2176696
Applicant/Proprietor	
ADC Telecommunications, INC.	

EPA/EPO/OEB Formblatt/Form/Formulaire : 2008

Empfangsbescheinigung über den Zugang des vorstehend bezeichneten Schriftstücks
Acknowledgement of receipt of the document specified above
Récépissé du document spécifié ci-dessus

Unter Bezugnahme auf die Mitteilung im ABl EPA 7/2010, 377 wird gebeten, die Empfangsbescheinigung mit Empfangsdatum und Unterschrift zu versehen und **umgehend** an das EPA zurückzusenden:

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- **über die Online-Dienste des EPA** (als Anlage zu EPA Form 1038) / **through EPO Online Services** (as annex to EPO Form 1038) / **par les services en ligne de l'OEB** (en tant que pièce jointe au formulaire OEB 1038),
- **per Fax / by fax / par téléfax (+49 (0) 89 2399-4465 or +31 (0) 70 340-3016)**
- oder per Post / or by post / ou par courrier.

Empfangen am / Received on / Reçu le :

MEISSNER, BOLTE & PARTNER
ZE PO HG
BU SJ SH
TX BO FL
CP KR JK
PA RU TR
WH HZ INN
EING.: 10. Sep. 2013
WV
LT

Unterschrift / Signature:

Empfangsberechtigter/authorised recipient/
le destinataire ou la personne dûment mandatée

Rücksende-Adresse / Return address / Adresse de retour
(Umschlag / envelope / enveloppe ISO C4 / DL / C6/C5 / C6)

Europäisches Patentamt
80298 MÜNCHEN
DEUTSCHLAND

Rücksende-Adresse / Return address / Adresse de retour

EPA/EPO/OEB Form 2936 08.10

IPR2025-01119
Belden EX1010
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Rückschein National

Bitte **unbedingt** die Rückseite ausfüllen!

Sendungsnummer/Identcode

BE110 12103 09 09 2013

RG 55 256 693 4DE

Auslieferungsvermerk

☐ Empfänger ☐ Ehegatte

☒ Empfangsbevollmächtigter

☐ Anderer Empfangsberechtigter

(Ersatzempfänger gemäß AGB BRIEF NATIONAL bzw. AGB PAKET/EXPRESS NATIONAL)

Ich habe die Sendung dem Empfangsberechtigten übergeben.

Datum 10 09 13

Postmitarbeiter/Zusteller: Unterschrift

X

Empfänger der Sendung

Name/Firma

Bohnenberger, Johannes
Meissner, Bolte & Partner GbR
Postfach 86 06 24
81633 München
ALLEMAGNE

EP 08837186.9/1504

Straße

Postleitzahl

Empfangsbestätigung

Name und Vorname in GROSSBUCHSTABEN

Ich bestätige, die Sendung am heutigen Tag erhalten zu haben.

Datum 10 09 13

Empfangsberechtigter: Unterschrift

X

Page 287 of 412

Belegexemplar EPA/EPO/OEB Form 1007 (01.13) EPR202

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Tragen Sie bitte rechts Ihre vollständige Adresse ein.

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- ggf. „Sendungsnummer/Identcode"

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Postleitzahl, Ort

IPR2025-01119
Belden EX1010

Meissner Bolte & Partner GbR · Postfach/P.O. Box 860624 · D-81633 München

Patentanwälte
European Patent Attorneys
European Trademark Attorneys
European Design Attorneys
Rechtsanwälte
Lawyers

Kanzlei | Office München
Meissner Bolte & Partner GbR
Widenmayerstraße 47
D-80538 München | Germany
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Fax: +49-(0)89-21 21 86 70
E-Mail: mail@mbp.de
www.mbp.de

European Patent Office

80298 München

EPO - Munich
27
17. Okt. 2013

Datum Date	Ihr Zeichen Your ref.	Unser Zeichen Our ref.	Ihr Ansprechpartner Your contact
October 16, 2013 BO/BM/cd/kad	08837186.9-1504	M/MGD-354-PC/EP	Dr. J. Bohnenberger Martin Bicker

European Patent Application No. 08837186.9-1504
"FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL"
ADC Telecommunications, Inc.

ip_law@mbp.®

Dear Madam/Sir,

In response to the Summons to attend Oral Proceedings dated September 9, 2013, the Applicant herewith files the following documents:

As a Main Request, we request that examination be continued on the basis of the following documents:

- Main Request of claims 1-15 as enclosed;
- description pages 1-2, 5 and 11 as enclosed;
- description page 1a to be inserted accordingly, as enclosed;
- description pages 3-4, and 6-10 as originally filed; as well as
- drawing sheets 1/14 to 14/14 as originally filed.

The Examiner will note that the Applicant has chosen to file an amended set of claims 1-15 that is based on claims 1-15 as filed October 11, 2011, and as discussed herein below. These claims replace the claims presently on file. A marked-up copy of the claims is enclosed for the Examiner's convenience.

Support for the amendments can be found as follows:

New claim 1	Claim 1 of October 11, 2011 (Original claim 1 Page 4, lines 17 to 19 and Page 6, lines 29 to 31 Page 11, lines 5 to 9 in combination with Fig. 12) Page 11, lines 8 to 9 Figs. 12, 13, 14
New claims 2 to 5	Claims 2 to 5 of October 11, 2011 (Original claims 2 to 5)
New claim 6	Claim 6 of October 11, 2011 (Original claim 7)
New claim 7	Claim 15 of October 11, 2011 (Page 5, lines 29 to 32)
New claim 8	Claim 7 of October 11, 2011 (Original claim 8 Original claim 1 Page 4, lines 17 to 19 and Page 6, lines 29 to 31 Page 11, lines 5 to 9 in combination with Fig. 12 Page 11, lines 8 to 9)
New claims 9 to 15	Claims 8 to 14 of October 11, 2011 (Original claims 10 to 14, 16, and 17)

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Remarks – Main Request:

1. As indicated in the aforementioned Communication, the Examiner was not convinced by any of the argumentation provided in the previous response of November 29, 2012, and thus maintains the opinion that the claims are not novel or inventive over the prior art. The Applicant respectfully disagrees with the Examiner's opinion, and provides further argumentation to the contrary herein.

2. For the sake of completeness, the Applicant outlines the present invention in terms of general components. The present invention provides a device for the dispensing of a subscriber cable (122) from a spool (137) wherein the subscriber cable is wrapped around the spool. In such an arrangement, the spool is provided so as to rotate about

its axis and the subscriber cable may be extended or withdrawn from a housing (123) via a port (131) disposed on the side of the housing.

3. On top of the spool is located an adapter plate (149) which accommodates connectors (401) as shown in Fig. 15. In one end of the connectors, the fanned-out ends of the subscriber cable are connected. That is, a sheathed end of the subscriber cable exits the housing via the port, and the other end is firstly wrapped around the spool and then is passed through an opening (142) in the upper axial end (136) of the spool. Here, the other end is fanned-out, passed around a cable management spool (161) and connected, via the individually fanned-out fibers, to the connectors. In the other end of the connectors, a second set of subscriber cables (126) are connected, wherein these cables pass through a second opening (136) in the housing; this is shown with respect to Fig. 12, for example.

4. In operation, the subscriber cable (122) is withdrawn from the fiber optic enclosure assembly (121) and, in doing so, the spool rotates. Accordingly, the cable management spool and adapter plate rotate in unison with the spool, preserving the relative angles and positions of the components. This ensures that, effectively, the cables from the opening (142) in the spool to the connectors remain stationary in relation to the upper surface of the spool, thereby preventing damage thereto. Once the cable has been paid out, the spool is locked into a certain position, and the second subscriber cables (126) are connected to the connectors.

5. In the previous response to the EPO, dated November 29, 2012, emphasis was placed on the fact that the second subscriber cables are connected to the connectors while the connectors are inside the housing; that is, the connectors are provided in an internal space of the housing. As argued at some length, the prior art document D1 does not provide this limitation and thus the present application differs from D1 in at least this regard.

6. Considering D1, D1 discloses a cable (D1, 23) that is paid out of a housing or frame (D1, 27) via an access port (D1, 35). The opposite end of the cable is wrapped around a reel (D1, 11) in a similar fashion to the present application. The cable is then routed towards a fan out member mounted on a hub (D1, 13) of the reel, to thereby form individual cables (D1, 61) which in turn are routed towards a connector panel

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(D1, 53) that is also mounted on the hub. The connector panel houses several connectors (D1, 55) and may be thought of as synonymous with the adapter plate of the present application. As with the present application, the dispensing of the cable causes the reel to rotate but preserves the relative positions of the components and cables.

7. D1 differs, however, in that the connector panel is provided movably with respect to the hub, and is mounted to the hub via a reel docking station (D1, 47). As stressed previously, when a length of cable is to be paid out, the connector panel is disposed in the docking station, thereby allowing the components to remain stationary relative to the hub. When the cable is paid out to the required distance, the connector panel is removed and mounted to the docking station of the frame (D1, 43). Once docked here, and only when docked here, the second subscriber cables (D1, 59) are connected to the connectors of the connector panel. This is shown with respect to Figs. 5 and 6.

8. As evident in the Summons, the Examiner is of the opinion that claim 1 is not novel over the prior art, despite the "interior" limitation discussed previously. This may be due, primarily, to the use of the term "allow" which essentially only limits the feature to be able to perform that function. Thus, the docking station (D1, 43) could be considered to be a port that would allow the subscriber cables to be inserted and connected in the interior; the cables would merely need to be passed there through. This, however, is amended given the discussion below with respect to the method claim, claim 8.

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9. Claim 8 details a method for dispensing a fiber optic cable and is essentially outlined with regards to the description given above. The characterising portion thereof states:

> *"connecting a connectorized end of a second fiber optic cable to the termination module (45; 149) in the interior region (33; 130) of the fiber optic enclosure".*

As stated above, this is novel over the prior art document D1; D1 does not teach that the connection of the second fiber optic cable is performed in the interior region of the enclosure.

10. In section 3.2 of the Summons, the Examiner states that it would be one of several straight forward modifications to provide the feature of connecting the cables

inside the enclosure. According to the Examiner, one skilled in the art would realise that, once the cable spool or reel is in a fixed position to the housing, the cables are no longer in danger of being damaged, and therefore one skilled in the art may connect the cables. This, according to the Examiner, could include connecting the cables internally to the enclosure.

11. It was argued previously that, while this may be the case, the device of D1 does not limit the locking position of the reel, and so the reel may be locked, effectively, at any angle relative to the docking station (D1, 43). Of course, if the angle is 180°, this means that the second subscriber cables would have to be bent at a large angle in order to enter the housing through the port of the docking station (D1, 43) and then be connected to the connector panel. That is, the cables would have to enter the housing through the port of the docking station and be bent back on themselves 180° once inside the housing in order to connect to the connector panel. Equally, it was argued that the rod (D1, 41) would also inhibit such a connection. While the Applicant asserts that these arguments are still valid, a further argument is also put forth.

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12. It was also argued previously that the positioning of the cables in the interior of the housing in the present application improves the durability and protection of the device from the environment. Such a technical problem is obviously derivable from the application, especially when considering the usage of the slotted foam member (138) discussed on page 11, lines 9-13 and with regards to Figs. 13 and 14 – note that the reference sign is supposed to read 128, as 138 is already indicative of the lower axial end of the spool.

13. Thus, one could pose the objective technical problem of how to improve the weather resistivity of the device of document D1. As is apparent, document D1 does not address this problem directly, primarily due to the fact that document D1 is concerned with providing a device to be used inside; see the background section of D1 which refers specifically to local area networks, office rooms in the same building, trade shows, etc.

14. If one skilled in the art starts from the teachings of document D1, there seems to be little motivation to position the connection of the cables internally to the device. As is readily apparent, even the internal configuration of document D1 is not weather tight – D1 shows a rather apparent hole in the top surface of the device for accommodating the

reel and components situated thereon; of course, this hole is provided to allow for manipulation of the connector panel and reel by an operator. One skilled in the art would not, therefore, seem to be motivated to position the connectors inside the "frame" of D1 to solve the aforementioned technical problem.

15. Equally, by the Examiner's own admission, one skilled in the art would realise that the device is in a state for accepting the second subscriber cables once the spool or reel is locked. Accordingly, in D1, the reel is locked *"[w]hen connector panel 55 is removed from the reel docking mechanism"* (D1, Col. 3, lines 49-52). Considering this, and the previous sentence of D1, one skilled in the art realises that the removal of the connector panel acts to lock the reel, due to the construction of the locking assembly. It is therefore apparent that one skilled in the art is unlikely to connect the cables without removing the connector panel, in contrast to the Examiner's comments under section 3.2 of the Summons.

16. If the connector panel is removed, one skilled in the art must position this in an alternative location. D1 clearly defines this as the docking station (D1, 47). However, positioning the connection panel in an arbitrary location in the device of D1 does not solve the aforementioned technical problem of improving weather resistance for the reasons given above regarding the access hole. Indeed, to solve such a problem, one skilled in the art would have to look towards other documents for such a solution. Therefore, while one skilled in the art could position the connector panel in a position such that the connections would be those of claim 8, one skilled in the art has no reason to do so (this does not solve the objective technical problem of improving weather resistance of the device), and therefore, one skilled in the art would not perform such.

17. As a further note, there is no reason as to why one skilled in the art would adapt the device of D1 merely as a design choice. The device of D1 requires several major modifications in order to accommodate the connector panel internally to the frame (when the second subscriber cables are present). Firstly, the dimensions of the housing must be adapted in order to accommodate the bending of the cables (i.e., when the second subscriber cables must bend back on themselves when the connector is moved by 180° with respect to the frame docking station). Equally, the locking mechanism must be adapted, and the rod (D1, 41), which is explicitly taught as being used to "*rotate reel 11 relative to the frame*" (D1, Col. 2, lines 43-45), must also be removed and an

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alternative solution for rotating the reel found. These are several major and fundamental aspects of the teachings of document D1, and to simply ignore these teachings in order to "rearrange" the device to solve no further technical problem would not seem to be an action that one skilled in the art would readily undertake.

18. Furthermore, the Examiner will note that the Applicant has amended claim 1 to discuss the fact that the second cables are included as part of the device, thus these cables are now a claimed feature of claim 1. This is a minor modification to what was previously presented, but conforms to the disclosure of the method claim 8. Therefore, the same reasoning above also applies to the amended claim 1.

19. To summarise, if one skilled in the art is presented with document D1 and aims to solve the problem of adapting the device to be used in an outside environment, thus being resistant to weather conditions, one skilled in the art is not motivated to position the connections of the second subscriber cables internally to the frame of the device – this does not solve the aforementioned technical problem. Moreover, it is not merely a design choice for one skilled in the art to position these connections internally to the frame, as several explicitly taught features are ignored or removed in doing so, and severe modifications and alternative solutions are subsequently required. Indeed, due to the fact that the locking mechanism is operated via the removal of the connector panel, that the prior art would not be modified according to claim 1; as discussed previously, there is no motivation to not move the connector panel, and no motivation to position the connector panel internally to the device of D1. In light of the above, the Applicant asserts that the Main Request of claims is both novel and inventive over the cited prior art.

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Remarks – First Auxiliary Request:

20. The Applicant requests that, should the Examiner have doubts regarding the patentability of the Applicant's Main Request as recited in the opening section of this letter, the Examiner is kindly invited to continue examination on the basis of the following documents as an Auxiliary Request:

- First Auxiliary Request claims 1-15 as enclosed;
- description pages 1-2, 5 and 11 as enclosed;

- description page 1a to be inserted accordingly, as enclosed;
- description pages 3-4, and 6-10 as originally filed; as well as
- drawing sheets 1/14 to 14/14 as originally filed.

Support for the amendments can be found as follows:

New claim 1	Claim 1 of Main Request
	Page 11, lines 9 to 13
New claims 2 to 7	Claims 2 to 7 of Main Request
New claim 8	Claim 8 of Main Request
	Page 11, lines 9 to 13
New claims 9 to 15	Claims 9 to 15 of Main Request

21. As with the Main Request, the First Auxiliary Request aims to further enhance the weatherproofing of the dispensing device. In this regard, the First Auxiliary Request includes the slotted foam member (138) as discussed briefly above. This component is provided to seal the opening for the second subscriber cables and ensures that the enclosure is further weather and environment resistant. As above, this feature is clearly novel over D1, D1 simply provides no consideration of weatherproofing, let alone a slotted foam member. Furthermore, there is no hint in the prior art to provide such a feature – if one skilled in the art were to improve the weather resistance of the second subscriber cables, or connections thereof, then one skilled in the art would firstly look at providing a weather sealant on the connector panel, rather than block the docking station (D1, 43) altogether, for example. Such a modification does not solve the technical problem of improving the weather resistance of the device, and thus one skilled in the art is provided with no motivation to utilise the foam member. Indeed, owing to the fact that D1 requires manipulation of the connector panel, it seems highly unlikely that, to solve the aforementioned technical problem, one skilled in the art would firstly position the connector panel internally to the frame and secondly direct several subscriber cables through a fairly rigid or at least restrictive foam member to an arbitrary position in the frame (such a member would need to be restrictive in order to provide a sealing effect; that is, not allow for substantial movement of the cables). Therefore, the First Auxiliary Request of claims is also asserted to be novel and inventive over the prior art.

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Remarks – Second Auxiliary Request:

22. The Applicant requests that, should the Examiner have doubts regarding the patentability of the Applicant's Main Request as recited in the opening section of this letter, the Examiner is kindly invited to continue examination on the basis of the following documents as a Second Auxiliary Request:

- Second Auxiliary Request claims 1-15 as enclosed;
- description pages 1-2, 5 and 11 as enclosed;
- description page 1a to be inserted accordingly, as enclosed;
- description pages 3-4, and 6-10 as originally filed; as well as
- drawing sheets 1/14 to 14/14 as originally filed.

Support for the amendments can be found as follows:

New claim 1	Claim 1 of Main Request
	Page 11, lines 9 to 13
	Page 9, lines 12 to 13
New claims 2 to 7	Claims 2 to 7 of Main Request
New claim 8	Claim 8 of Main Request
	Page 11, lines 9 to 13
	Page 9, lines 12 to 13
New claims 9 to 15	Claims 9 to 15 of Main Request

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23. As a further amendment, the Applicant has further specified the hinged cover (25, 125) in combination with the above features of the First Auxiliary Request. The hinged cover is provided to allow access to the interior of the housing as well as seal the interior from the environment. Whilst this advantage or function is not literally disclosed in the application as filed, the function of a hinged cover is rather inherent to the nature of such a feature, as is stated above. Clearly, document D1 alone does not provide the hinged cover and the foam member, and as before, there is no motivation to provide such a configuration. The Second Auxiliary Request is also asserted to be novel and inventive for these reasons.

Remarks – Conclusion:

24. It is hoped that the submissions overcome the outstanding objections from the Examining Division. Should certain minor amendment be required to bring the claims into an allowable format, the Applicant's Representative will be delighted to attend to such at short notice. In particular it is hoped that the submission will obviate the necessity of the Oral Proceedings. Should the Oral Proceedings be continued as scheduled, the Applicant will be represented by Dr. Andrew Parker from our law firm Meissner Bolte & Partner.

Yours faithfully,

Dr. Johannes Bohnenberger
European Patent Attorney

Enclosures:
- Main Request of claims 1-15
- Main Request of claims 1-15 (Marked-up Copy)
- First Auxiliary Request of claims 1-15
- First Auxiliary Request of claims 1-15 (Marked-up Copy)
- Second Auxiliary Request of claims 1-15
- Second Auxiliary Request of claims 1-15 (Marked-up Copy)
- New description pages 1, 1a, 2, 5 and 11

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FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

Cross-Reference to Related Application

~~This application is being filed on 05 August 2008, as a PCT~~ International Patent application in the name of ADC Telecommunications, Inc., a U.S. national corporation, applicant for the designation of all countries except the U.S., and Scott C. KOWALCZYK, a citizen of the U.S., Jonathan Walter COAN, a citizen of the U.S., and Jonathan KAML, a citizen of the U.S., applicants for the designation of the U.S. only, and claims priority to U.S. Provisional Patent Application Serial No. 60/954,214 filed on 06 August 2007, U.S. Provisional Patent Application Serial No. 61/029,248 filed on 15 February 2008, and U.S. Utility ~~Patent Application Serial No. 12/182,705 filed on 30 July 2008.~~

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.

<- insert page 1a ->

~~Summary~~

exemplary device

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

DESCRIPTION

One prior art approach is disclosed in US 6 220 413, which shows a cable storage device which has a reel rotatably mounted in a frame. A connector panel for connecting fiber optic cables fits on the reel for rotation with the reel. When lines leading to an equipment are to be connected to the connector panel, the connector panel is moved to a docking station on the reel.

SUMMARY

The present invention provides a fiber optic enclosure assembly for enclosing optical fiber connections according to independent claim 1. Further, the present invention provides a method of paying out a fiber optic cable from a fiber optic enclosure according to independent claim 8. Further advantageous embodiments of the invention may be realised according to the corresponding dependent claims.

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.

exemplary method
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.

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 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.~~

FIRST AUXILIARY REQUEST OF CLAIMS

1. A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing (23; 123) having an interior region (33; 130);

a bearing mount (71) disposed in the interior region (33; 130) of the housing (23; 123);

a cable spool (37; 137) engaged with the bearing mount (71) such that the cable spool (37; 137) selectively rotates within the housing (23; 123);

a termination module (45; 149) disposed on the cable spool (37; 137) so that the termination module (45; 149) rotates in unison with the cable spool (37; 137); and

a first fiber optic cable (22; 122) wrapped about a spooling portion of the cable spool (37; 137), the first fiber optic cable (22; 122) having connectorized ends (146) that are routed to the termination module (45; 149);

characterized in that

the housing (23; 123) includes a port (136) wherein a second fiber optic cable having connectorized ends is connected to the termination module (45; 149) in the interior region (33; 130) of the housing (23; 123) and exits the housing via the port, and

a slotted foam member (128) is disposed in the port (136), the slotted foam member including a plurality of slots through which the second fiber optic cable is inserted.

2. A fiber optic enclosure assembly as claimed in claim 1, wherein a needle bearing is disposed on an outer surface (73) of the bearing mount (71).

3. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with a plurality of adapters (401) engaged with the adapter slot (55).

4. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes a plurality of sliding adapter modules.

5. A fiber optic enclosure assembly as claimed in claim 1, wherein the axial end (41; 136) of the cable spool (37; 137) defines a cable passage (63).

6. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that is a cable management spool (61; 161).

7. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that includes an outer radius that is larger than a minimum bend radius of the fiber optic cable.

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

providing a fiber optic enclosure including:

a housing (23; 123) defining an interior region (33; 130);

a cable spool (37; 137) disposed in the interior region (33; 130), the cable spool (37; 137) having a spooling portion (39);

a termination module (45; 149) disposed on the cable spool (37; 137);

a first fiber optic cable (22; 122) coiled around the spooling portion (39) of the cable spool (37; 137), the first fiber optic cable (22; 122) including connectorized ends (146) that are engaged with the termination module (45; 149);

rotating the cable spool (37; 137) about an axis of the housing (23; 123) of the fiber optic enclosure until a desired length of the first fiber optic cable (22; 122) is paid out

characterized by

connecting a connectorized end of a second fiber optic cable to the termination module (45; 149) in the interior region (33; 130) of the fiber optic enclosure, and

providing a slotted foam member (128), the slotted foam member including a plurality of slots through which the second fiber optic cable is inserted.

9. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the termination module (45; 149) includes a plurality of adapters (401).

10. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with the plurality of adapters (401) engaged with the adapter slot (55).

11. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9, where the termination module (45; 149) includes a plurality of sliding adapter modules.

12. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the connectorized ends (146) of a first end of the first fiber optic cable (22; 122) are connected to adapters (401) disposed in the termination module (45; 149).

13. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the housing (23; 123) is mounted to a wall.

14. 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 (37; 137) with respect to the housing (23; 123) when the desired length of the first fiber optic cable (22; 122) has been paid out.

15. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 14, wherein a pin fixes the position of the cable spool (37; 137) with respect to the housing (23; 123).

SECOND AUXILIARY REQUEST OF CLAIMS

1. A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing (23; 123) having an interior region (33; 130);

a bearing mount (71) disposed in the interior region (33; 130) of the housing (23; 123);

a cable spool (37; 137) engaged with the bearing mount (71) such that the cable spool (37; 137) selectively rotates within the housing (23; 123);

a termination module (45; 149) disposed on the cable spool (37; 137) so that the termination module (45; 149) rotates in unison with the cable spool (37; 137); and

a first fiber optic cable (22; 122) wrapped about a spooling portion of the cable spool (37; 137), the first fiber optic cable (22; 122) having connectorized ends (146) that are routed to the termination module (45; 149);

characterized in that

the housing (23; 123) includes a port (136) wherein a second fiber optic cable having connectorized ends is connected to the termination module (45; 149) in the interior region (33; 130) of the housing (23; 123) and exits the housing via the port, and

a slotted foam member (128) is disposed in the port (136), the slotted foam member including a plurality of slots through which the second fiber optic cable is inserted, and

the housing (23; 123) includes a hinged cover (25, 125).

2. A fiber optic enclosure assembly as claimed in claim 1, wherein a needle bearing is disposed on an outer surface (73) of the bearing mount (71).

3. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with a plurality of adapters (401) engaged with the adapter slot (55).

4. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes a plurality of sliding adapter modules.

5. A fiber optic enclosure assembly as claimed in claim 1, wherein the axial end (41; 136) of the cable spool (37; 137) defines a cable passage (63).

6. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that is a cable management spool (61; 161).

7. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that includes an outer radius that is larger than a minimum bend radius of the fiber optic cable.

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

providing a fiber optic enclosure including:

a housing (23; 123) defining an interior region (33; 130);

a cable spool (37; 137) disposed in the interior region (33; 130), the cable spool (37; 137) having a spooling portion (39);

a termination module (45; 149) disposed on the cable spool (37; 137);

a first fiber optic cable (22; 122) coiled around the spooling portion (39) of the cable spool (37; 137), the first fiber optic cable (22; 122) including connectorized ends (146) that are engaged with the termination module (45; 149);

rotating the cable spool (37; 137) about an axis of the housing (23; 123) of the fiber optic enclosure until a desired length of the first fiber optic cable (22; 122) is paid out

characterized by

connecting a connectorized end of a second fiber optic cable to the termination module (45; 149) in the interior region (33; 130) of the fiber optic enclosure, and

providing a slotted foam member (128), the slotted foam member including a plurality of slots through which the second fiber optic cable is inserted, and

providing the housing (23; 123) with a hinged cover (25, 125).

9. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the termination module (45; 149) includes a plurality of adapters (401).

10. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9 ~~8~~, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with the plurality of adapters (401) engaged with the adapter slot (55).

11. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9, where the termination module (45; 149) includes a plurality of sliding adapter modules.

12. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the connectorized ends (146) of a first end of the first fiber optic cable (22; 122) are connected to adapters (401) disposed in the termination module (45; 149).

13. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the housing (23; 123) is mounted to a wall.

14. 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 (37; 137) with respect to the housing (23; 123) when the desired length of the first fiber optic cable (22; 122) has been paid out.

15. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 14, wherein a pin fixes the position of the cable spool (37; 137) with respect to the housing (23; 123).

MAIN REQUEST OF CLAIMS

1. A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing (23; 123) having an interior region (33; 130);

a bearing mount (71) disposed in the interior region (33; 130) of the housing (23; 123);

a cable spool (37; 137) engaged with the bearing mount (71) such that the cable spool (37; 137) selectively rotates within the housing (23; 123);

a termination module (45; 149) disposed on the cable spool (37; 137) so that the termination module (45; 149) rotates in unison with the cable spool (37; 137); and

a first fiber optic cable (22; 122) wrapped about a spooling portion of the cable spool (37; 137), the first fiber optic cable (22; 122) having connectorized ends (146) that are routed to the termination module (45; 149);

characterized in that

the housing (23; 123) includes a port (136) wherein a second fiber optic cable having connectorized ends is connected to the termination module (45; 149) in the interior region (33; 130) of the housing (23; 123) and exits the housing via the port.

2. A fiber optic enclosure assembly as claimed in claim 1, wherein a needle bearing is disposed on an outer surface (73) of the bearing mount (71).

3. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with a plurality of adapters (401) engaged with the adapter slot (55).

4. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes a plurality of sliding adapter modules.

5. A fiber optic enclosure assembly as claimed in claim 1, wherein the axial end (41; 136) of the cable spool (37; 137) defines a cable passage (63).

6. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that is a cable management spool (61; 161).

7. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that includes an outer radius that is larger than a minimum bend radius of the fiber optic cable.

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

providing a fiber optic enclosure including:

a housing (23; 123) defining an interior region (33; 130);

a cable spool (37; 137) disposed in the interior region (33; 130), the cable spool (37; 137) having a spooling portion (39);

a termination module (45; 149) disposed on the cable spool (37; 137);

a first fiber optic cable (22; 122) coiled around the spooling portion (39) of the cable spool (37; 137), the first fiber optic cable (22; 122) including connectorized ends (146) that are engaged with the termination module

(45; 149);

rotating the cable spool (37; 137) about an axis of the housing (23; 123) of the fiber optic enclosure until a desired length of the first fiber optic cable (22; 122) is paid out

characterized by

connecting a connectorized end of a second fiber optic cable to the termination module (45; 149) in the interior region (33; 130) of the fiber optic enclosure.

9. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the termination module (45; 149) includes a plurality of adapters (401).

10. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with the plurality of adapters (401) engaged with the adapter slot (55).

11. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9, where the termination module (45; 149) includes a plurality of sliding adapter modules.

12. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the connectorized ends (146) of a first end of the first fiber optic cable (22; 122) are connected to adapters (401) disposed in the termination module (45; 149).

13. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the housing (23; 123) is mounted to a wall.

14. 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

(37; 137) with respect to the housing (23; 123) when the desired length of the first fiber optic cable (22; 122) has been paid out.

15. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 14, wherein a pin fixes the position of the cable spool (37; 137) with respect to the housing (23; 123).

FIRST AUXILIARY REQUEST OF CLAIMS (MARKED-UP COPY)

1. A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing (23; 123) having an interior region (33; 130);

a bearing mount (71) disposed in the interior region (33; 130) of the housing (23; 123);

a cable spool (37; 137) engaged with the bearing mount (71) such that the cable spool (37; 137) selectively rotates within the housing (23; 123);

a termination module (45; 149) disposed on the cable spool (37; 137) so that the termination module (45; 149) rotates in unison with the cable spool (37; 137); and

a first fiber optic cable (22; 122) wrapped about a spooling portion of the cable spool (37; 137), the first fiber optic cable (22; 122) having connectorized ends (146) that are routed to the termination module (45; 149);

characterized in that the housing (23; 123) includes a port (136) ~~allowing~~ wherein a second fiber optic cable having connectorized ends is connected to the termination module (45; 149) in the interior region (33; 130) of the housing (23; 123) ~~to~~ and exits the housing via the port [Fig. 12, 13, 14; Pg. 11, lines 8-9], and

a slotted foam member (128) is disposed in the port (136), the slotted foam member including a plurality of slots through which the second fiber optic cable is inserted. [Pg. 11, lines 9-13]

2. A fiber optic enclosure assembly as claimed in claim 1, wherein a needle bearing is disposed on an outer surface (73) of the bearing mount (71).

3. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with a plurality of adapters (401) engaged with the adapter slot (55).

4. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes a plurality of sliding adapter modules.

5. A fiber optic enclosure assembly as claimed in claim 1, wherein the axial end (41; 136) of the cable spool (37; 137) defines a cable passage (63).

6. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that is a cable management spool (61; 161).

8 ~~7~~.A method of paying out a fiber optic cable from a fiber optic enclosure, comprising:

providing a fiber optic enclosure including:

a housing (23; 123) defining an interior region (33; 130);

a cable spool (37; 137) disposed in the interior region (33; 130), the cable spool (37; 137) having a spooling portion (39);

a termination module (45; 149) disposed on the cable spool (37; 137);

a first fiber optic cable (22; 122) coiled around the spooling portion (39) of the cable spool (37; 137), the first fiber optic cable (22; 122) including connectorized ends (146) that are engaged with the termination module (45; 149);

rotating the cable spool (37; 137) about an axis of the housing (23; 123) of the fiber optic enclosure until a desired length of the first fiber optic cable (22; 122) is paid out

characterized by

connecting a connectorized end of a second fiber optic cable to the termination module (45; 149) in the interior region (33; 130) of the fiber optic enclosure, and

providing a slotted foam member (128), the slotted foam member including a plurality of slots through which the second fiber optic cable is inserted. [Pg. 11, lines 9-13].

9 ~~8~~.A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the termination module (45; 149) includes a plurality of adapters (401).

10 ~~9~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9 ~~8~~, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with the plurality of adapters (401) engaged with the adapter slot (55).

11 ~~10~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9 ~~8~~, where the termination module (45; 149) includes a plurality of sliding adapter modules.

12 ~~11~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the connectorized ends (146) of a first end of the first fiber optic cable (22; 122) are connected to adapters (401) disposed in the termination module (45; 149).

13 ~~12~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the housing (23; 123) is mounted to a wall.

14 ~~13~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, further comprising fixing the position of the cable spool (37; 137) with respect to the housing (23; 123) when the desired length of the first fiber optic cable (22; 122) has been paid out.

15 ~~14~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 14 ~~13~~, wherein a pin fixes the position of the cable spool (37; 137) with respect to the housing (23; 123).

7 ~~15~~. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that includes an outer radius that is larger than a minimum bend radius of the fiber optic cable.

MAIN REQUEST OF CLAIMS (MARKED-UP COPY)

1. A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing (23; 123) having an interior region (33; 130);

a bearing mount (71) disposed in the interior region (33; 130) of the housing (23; 123);

a cable spool (37; 137) engaged with the bearing mount (71) such that the cable spool (37; 137) selectively rotates within the housing (23; 123);

a termination module (45; 149) disposed on the cable spool (37; 137) so that the termination module (45; 149) rotates in unison with the cable spool (37; 137); and

a first fiber optic cable (22; 122) wrapped about a spooling portion of the cable spool (37; 137), the first fiber optic cable (22; 122) having connectorized ends (146) that are routed to the termination module (45; 149);

characterized in that the housing (23; 123) includes a port (136) ~~allowing~~ wherein a second fiber optic cable having connectorized ends is connected to the termination module (45; 149) in the interior region (33; 130) of the housing (23; 123) ~~to~~ and exits the housing via the port. [Fig. 12, 13, 14; Pg. 11, lines 8-9; Pg. 11 lines 5-9 and Fig. 12 for original characterized text]

2. A fiber optic enclosure assembly as claimed in claim 1, wherein a needle bearing is disposed on an outer surface (73) of the bearing mount (71).

3. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with a plurality of adapters (401) engaged with the adapter slot (55).

4. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes a plurality of sliding adapter modules.

5. A fiber optic enclosure assembly as claimed in claim 1, wherein the axial end (41; 136) of the cable spool (37; 137) defines a cable passage (63).

6. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that is a cable management spool (61; 161).

8 ~~7~~.A method of paying out a fiber optic cable from a fiber optic enclosure, comprising:

providing a fiber optic enclosure including:

a housing (23; 123) defining an interior region (33; 130);

a cable spool (37; 137) disposed in the interior region (33; 130), the cable spool (37; 137) having a spooling portion (39);

a termination module (45; 149) disposed on the cable spool (37; 137);

a first fiber optic cable (22; 122) coiled around the spooling portion (39) of the cable spool (37; 137), the first fiber optic cable (22; 122) including connectorized ends (146) that are engaged with the termination module (45; 149);

rotating the cable spool (37; 137) about an axis of the housing (23; 123) of the fiber optic enclosure until a desired length of the first fiber optic cable (22; 122) is paid out

characterized by

connecting a connectorized end of a second fiber optic cable to the termination module (45; 149) in the interior region (33; 130) of the fiber optic enclosure.

9 ~~8~~.A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the termination module (45; 149) includes a plurality of adapters (401).

10 ~~9~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9 ~~8~~, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with the plurality of adapters (401) engaged with the adapter slot (55).

11 ~~10~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9 ~~8~~, where the termination module (45; 149) includes a plurality of sliding adapter modules.

12 ~~11~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the connectorized ends (146) of a first end of the first fiber optic cable (22; 122) are connected to adapters (401) disposed in the termination module (45; 149).

13 ~~12~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the housing (23; 123) is mounted to a wall.

14 ~~13~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, further comprising fixing the position of the cable spool (37; 137) with respect to the housing (23; 123) when the desired length of the first fiber optic cable (22; 122) has been paid out.

15 ~~14~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 14 ~~13~~, wherein a pin fixes the position of the cable spool (37; 137) with respect to the housing (23; 123).

7 ~~15~~. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that includes an outer radius that is larger than a minimum bend radius of the fiber optic cable.

SECOND AUXILIARY REQUEST OF CLAIMS (MARKED-UP COPY)

1. A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing (23; 123) having an interior region (33; 130);

a bearing mount (71) disposed in the interior region (33; 130) of the housing (23; 123);

a cable spool (37; 137) engaged with the bearing mount (71) such that the cable spool (37; 137) selectively rotates within the housing (23; 123);

a termination module (45; 149) disposed on the cable spool (37; 137) so that the termination module (45; 149) rotates in unison with the cable spool (37; 137); and

a first fiber optic cable (22; 122) wrapped about a spooling portion of the cable spool (37; 137), the first fiber optic cable (22; 122) having connectorized ends (146) that are routed to the termination module (45; 149);

characterized in that the housing (23; 123) includes a port (136) ~~allowing~~ wherein a second fiber optic cable having connectorized ends is connected to the termination module (45; 149) in the interior region (33; 130) of the housing (23; 123) ~~to~~ and exits the housing via the port [Fig. 12, 13, 14; Pg. 11, lines 8-9], and

a slotted foam member (128) is disposed in the port (136), the slotted foam member including a plurality of slots through which the second fiber optic cable is inserted, and [Pg. 11, lines 9-13]

the housing (23; 123) includes a hinged cover (25, 125) [Pg. 9, lines 12-13].

2. A fiber optic enclosure assembly as claimed in claim 1, wherein a needle bearing is disposed on an outer surface (73) of the bearing mount (71).

3. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with a plurality of adapters (401) engaged with the adapter slot (55).

4. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes a plurality of sliding adapter modules.

5. A fiber optic enclosure assembly as claimed in claim 1, wherein the axial end (41; 136) of the cable spool (37; 137) defines a cable passage (63).

6. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that is a cable management spool (61; 161).

8 ~~7~~.A method of paying out a fiber optic cable from a fiber optic enclosure, comprising:

providing a fiber optic enclosure including:

a housing (23; 123) defining an interior region (33; 130);

a cable spool (37; 137) disposed in the interior region (33; 130), the cable spool (37; 137) having a spooling portion (39);

a termination module (45; 149) disposed on the cable spool (37; 137);

a first fiber optic cable (22; 122) coiled around the spooling portion (39) of the cable spool (37; 137), the first fiber optic cable (22; 122) including

connectorized ends (146) that are engaged with the termination module (45; 149);

rotating the cable spool (37; 137) about an axis of the housing (23; 123) of the fiber optic enclosure until a desired length of the first fiber optic cable (22; 122) is paid out

characterized by

connecting a connectorized end of a second fiber optic cable to the termination module (45; 149) in the interior region (33; 130) of the fiber optic enclosure, and

providing a slotted foam member (128), the slotted foam member including a plurality of slots through which the second fiber optic cable is inserted, and [Pg. 11, lines 9-13]

providing the housing (23; 123) with a hinged cover (25, 125) [Pg. 9, lines 12-13].

9 ~~8~~.A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the termination module (45; 149) includes a plurality of adapters (401).

10 ~~9~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9 ~~8~~, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with the plurality of adapters (401) engaged with the adapter slot (55).

11 ~~10~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9 ~~8~~, where the termination module (45; 149) includes a plurality of sliding adapter modules.

12 ~~11~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the connectorized ends (146) of

a first end of the first fiber optic cable (22; 122) are connected to adapters (401) disposed in the termination module (45; 149).

13 ~~12~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the housing (23; 123) is mounted to a wall.

14 ~~13~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, further comprising fixing the position of the cable spool (37; 137) with respect to the housing (23; 123) when the desired length of the first fiber optic cable (22; 122) has been paid out.

15 ~~14~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 14 ~~13~~, wherein a pin fixes the position of the cable spool (37; 137) with respect to the housing (23; 123).

7 ~~15~~. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that includes an outer radius that is larger than a minimum bend radius of the fiber optic cable.

Europäisches Patentamt
European Patent Office
Office européen des brevets

European patent application No. 08837186.9

URGENT !
To be completed (under II.) and returned to the formalities officer immediately

Maintenance / Change of date / Cancellation of oral proceedings arranged for: day 18.11.13 at 09.30 hrs

I. To the Examining / Opposition division

1. ☐ The proprietor has requested the revocation (or the like) of his patent (date: .....).

2. ☒ The party / witness Dr.J.Bohnenberger has indicated (date: 17.10.13) that he / she

   ☐ requests the date / time of oral proceedings to be changed.

   ☐ withdraws the request for oral proceedings.

   ☐ will not be attending.

   ☐ wishes to be heard by a national court.

   ☒ has filed amendments (in examination proceedings).

   ☐ has requested that the oral proceedings be held as a videoconference (in examination proceedings).

3. ☐ Two months before the oral proceedings the application is deemed to be withdrawn (in examination proceedings). The oral proceedings have to be cancelled.

21-10-2013
Date

Schulze, Cornelia
Formalities Officer

IPR2025-01119
Belden EX1010
CS30168

European patent application No. 08837186.9

II. To the Formalities Officer

1. ☐ The date / time fixed for oral proceedings is maintained.

☐ (if necessary) The reasons are indicated on enclosed EPO Form 2906/2906O, which is to be dispatched to the party with EPO Form 2008A/2310A.

2. ☐ At the instigation of the division the oral proceedings cannot take place on the arranged date for the reasons indicated on enclosed EPO Form 2906, which is to be dispatched to the party with EPO Form 2008A/2310A.

Date _____ Director (see Internal Instructions IE-III, 1.2) _____

3. ☐ The summons to attend oral proceedings on 18.11.13 should be cancelled.

3.1 ☐ The proceedings will be continued in writing.

3.2 ☐ A new date will be set later.

3.3 ☐ A new date/time is set as follows:

date ..... at ..... hrs.
Parties' written submissions and amendments in preparation for the oral proceedings, if any, should be made not later than

..... month(s) before the date of the oral proceedings.

4. ☐ The request for the oral proceedings to be held as a videoconference

4.1 ☐ is allowed.

4.2 ☐ is rejected for the reasons indicated on enclosed EPO Form 2906, which is to be dispatched to the party with EPO Form 2008A.

5. ☐ The application is deemed to be withdrawn. The oral proceedings are cancelled.

Date _____

Chairman _____ Second member _____ Primary Examiner _____ Legal member _____

III. Action taken by the formalities officer

☐ EPO Form 2008A/2310A has been dispatched, if applicable (see point II above) together with EPO Form 2906/2906O.

☐ A new summons has been dispatched.

☐ .....

Date _____ Formalities Officer _____

IPR2025-01119
Belden EX1010
CS30168

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Datum Date	Ihr Zeichen Your ref.	Unser Zeichen Our ref.	Ihr Ansprechpartner Your contact
November 13, 2013 BO/PA/BM/kad	08837186.9-1504	M/MGD-354-PC/EP	Dr. J. Bohnenberger Martin Bicker

European Patent Application No. 08837186.9-1504
FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
ADC Telecommunications, Inc.

ip_law@mbp.®

VERY URGENT

Dear Madam/Sir,

In response to the Summons to attend Oral Proceedings of September 9, 2013 and in response to the informal Communication of November 12, 2013.

We request that examination be continued on the basis of the following documents:

- claims 1-14 as enclosed;
- description pages 1-2, 1a, 5, and 11 as filed October 16, 2013;
- description pages 3-4 and 6-10 as originally filed; as well as
- drawing sheets 1/14 to 14/14 as originally filed.

The Examiner will note that the Applicant has chosen to file an amended set of claims 1-14 that is based on claims 1-15 as filed October 11, 2011, and as discussed herein below. These claims replace the claims presently on file. A marked-up copy of the claims is enclosed for the Examiner's convenience.

Duration: 13.11.2013 11:58:10 - 13.11.2013 12:00:06. This page 1 of 11 was completed at 13.11.2013 11:58:21
Received at the EPO on Nov 13, 2013 12:00:06. Page 1 of 11

Support for the amendments can be found as follows:

New claim 1	Claim 1 of October 11, 2011 (Original claim 1 Page 4, lines 17 to 19 and Page 6, lines 29 to 31 Page 11, lines 5 to 9 in combination with Fig. 12) Page 11, lines 8 to 9 Figs. 12, 13, 14 Page 8, lines 16 to 17, 19 to 20, and 20 to 22 Page 11, lines 5 to 8
New claims 2 to 5	Claims 2 to 5 of October 11, 2011 (Original claims 2 to 5)
New claim 6	Claim 6 of October 11, 2011 (Original claim 7)
New claim 7	Claim 15 of October 11, 2011 (Page 5, lines 29 to 32)
New claim 8	Claim 7 of October 11, 2011 (Original claim 8 Original claim 1 Page 4, lines 17 to 19 and Page 6, lines 29 to 31 Page 11, lines 5 to 9 in combination with Fig. 12 Page 11, lines 8 to 9) Page 8, lines 16 to 17, 19 to 20, and 20 to 22 Page 11, lines 5 to 8
New claims 9 to 14	Claims 8 to 12 and 14 of October 11, 2011 (Original claims 10 to 14 and 17)

ip_law@mbp.de

Remarks:

1. In response to the informal Communication received November 12, 2013, the Applicant herewith withdraws the Main, First Auxiliary and Second Auxiliary Requests as filed October 16, 2013. In addition, the Applicant herewith files a replacement claim set, for which examination should be continued upon.

Duration: 13.11.2013 11:58:10 - 13.11.2013 12:00:06. This page 2 of 11 was completed at 13.11.2013 11:58:31
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2. In the Communication of November 12, 2013, the Examining Division indicates their opinion that the Main, First Auxiliary and Second Auxiliary Requests as filed October 16, 2013 do not meet the requirements of novelty and inventiveness. The Examining Division, however, provided a proposal of claims that they deem to satisfy the requirements of the EPC. The Applicant has therefore accepted the Examining Division's proposal and accordingly files an amended set of claims detailing the same. As it is understood that the Examining Division's proposal satisfies the requirements of the EPC, an issuance of an Intention to Grant is kindly requested.

3. It is hoped that the submissions overcome the outstanding objections from the Examining Division. Should certain minor amendment be required to bring the claims into an allowable format, the Applicant's Representative will be delighted to attend to such at short notice. In particular it is hoped that the submission will obviate the necessity of the Oral Proceedings.

ip_law@mbp.®

Respectfully submitted,

Dr. Andrew Parker
European Patent Attorney

Enclosures:
- New Claims 1-14
- Marked-up Copy of Claims

Duration: 13.11.2013 11:58:10 - 13.11.2013 12:00:06. This page 3 of 11 was completed at 13.11.2013 11:58:41
Received at the EPO on Nov 13, 2013 12:00:06. Page 3 of 11

MEISSNER BOLTE

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European Patent Attorneys
European Trademark Attorneys
European Design Attorneys
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European Patent Office

80298 München

EPO - Munich
27
13. Nov. 2013

Datum Date	Ihr Zeichen Your ref.	Unser Zeichen Our ref.	Ihr Ansprechpartner Your contact
November 13, 2013 BO/PA/BM/kad	08837186.9-1504	M/MGD-354-PC/EP	Dr. J. Bohnenberger Martin Bicker

European Patent Application No. 08837186.9-1504
FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
ADC Telecommunications, Inc.

Confirmation

ip_law@mbp.®

VERY URGENT

Dear Madam/Sir,

In response to the Summons to attend Oral Proceedings of September 9, 2013 and in response to the informal Communication of November 12, 2013.

We request that examination be continued on the basis of the following documents:

- claims 1-14 as enclosed;
- description pages 1-2, 1a, 5, and 11 as filed October 16, 2013;
- description pages 3-4 and 6-10 as originally filed; as well as
- drawing sheets 1/14 to 14/14 as originally filed.

The Examiner will note that the Applicant has chosen to file an amended set of claims 1-14 that is based on claims 1-15 as filed October 11, 2011, and as discussed herein below. These claims replace the claims presently on file. A marked-up copy of the claims is enclosed for the Examiner's convenience.

Support for the amendments can be found as follows:

New claim 1	Claim 1 of October 11, 2011 (Original claim 1 Page 4, lines 17 to 19 and Page 6, lines 29 to 31 Page 11, lines 5 to 9 in combination with Fig. 12) Page 11, lines 8 to 9 Figs. 12, 13, 14 Page 8, lines 16 to 17, 19 to 20, and 20 to 22 Page 11, lines 5 to 8
New claims 2 to 5	Claims 2 to 5 of October 11, 2011 (Original claims 2 to 5)
New claim 6	Claim 6 of October 11, 2011 (Original claim 7)
New claim 7	Claim 15 of October 11, 2011 (Page 5, lines 29 to 32)
New claim 8	Claim 7 of October 11, 2011 (Original claim 8 Original claim 1 Page 4, lines 17 to 19 and Page 6, lines 29 to 31 Page 11, lines 5 to 9 in combination with Fig. 12 Page 11, lines 8 to 9) Page 8, lines 16 to 17, 19 to 20, and 20 to 22 Page 11, lines 5 to 8
New claims 9 to 14	Claims 8 to 12 and 14 of October 11, 2011 (Original claims 10 to 14 and 17)

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Remarks:

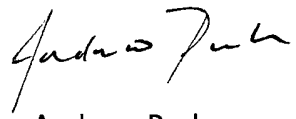
1. In response to the informal Communication received November 12, 2013, the Applicant herewith withdraws the Main, First Auxiliary and Second Auxiliary Requests as filed October 16, 2013. In addition, the Applicant herewith files a replacement claim set, for which examination should be continued upon.

2. In the Communication of November 12, 2013, the Examining Division indicates their opinion that the Main, First Auxiliary and Second Auxiliary Requests as filed October 16, 2013 do not meet the requirements of novelty and inventiveness. The Examining Division, however, provided a proposal of claims that they deem to satisfy the requirements of the EPC. The Applicant has therefore accepted the Examining Division's proposal and accordingly files an amended set of claims detailing the same. As it is understood that the Examining Division's proposal satisfies the requirements of the EPC, an issuance of an Intention to Grant is kindly requested.

3. It is hoped that the submissions overcome the outstanding objections from the Examining Division. Should certain minor amendment be required to bring the claims into an allowable format, the Applicant's Representative will be delighted to attend to such at short notice. In particular it is hoped that the submission will obviate the necessity of the Oral Proceedings.

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Respectfully submitted,



Dr. Andrew Parker
European Patent Attorney

Enclosures:
- New Claims 1-14
- Marked-up Copy of Claims

Europäisches Patentamt
European Patent Office
Office européen des brevets

European patent application No. 08837186.9

URGENT !
To be completed (under II.) and returned to the formalities officer immediately

Maintenance / Change of date / Cancellation of oral proceedings arranged for: day 18.11.13 at 09.30 hrs

I. To the Examining / Opposition division

1. ☐ The proprietor has requested the revocation (or the like) of his patent (date: .....).

2. ☒ The party / witness A. Parker ..... has indicated (date: .....13.11.13.....) that he / she

   ☐ requests the date / time of oral proceedings to be changed.

   ☐ withdraws the request for oral proceedings.

   ☐ will not be attending.

   ☐ wishes to be heard by a national court.

   ☒ has filed amendments (in examination proceedings).

   ☐ has requested that the oral proceedings be held as a videoconference (in examination proceedings).

3. ☐ Two months before the oral proceedings the application is deemed to be withdrawn (in examination proceedings). The oral proceedings have to be cancelled.

13-11-2013
Date

Schulze, Cornelia
Formalities Officer

IPR2025-01119
Belden EX1010
CS30168

European patent application No. 08837186.9

II. To the Formalities Officer

1. ☐ The date / time fixed for oral proceedings is maintained.

☐ (if necessary) The reasons are indicated on enclosed EPO Form 2906/2906O, which is to be dispatched to the party with EPO Form 2008A/2310A.

2. ☐ At the instigation of the division the oral proceedings cannot take place on the arranged date for the reasons indicated on enclosed EPO Form 2906, which is to be dispatched to the party with EPO Form 2008A/2310A.

Date _____ Director (see Internal Instructions IE-III, 1.2) _____

3. ☐ The summons to attend oral proceedings on 18.11.13 should be cancelled.

3.1 ☐ The proceedings will be continued in writing.

3.2 ☐ A new date will be set later.

3.3 ☐ A new date/time is set as follows:

date ..... at ..... hrs.
Parties' written submissions and amendments in preparation for the oral proceedings, if any, should be made not later than

..... month(s) before the date of the oral proceedings.

4. ☐ The request for the oral proceedings to be held as a videoconference

4.1 ☐ is allowed.

4.2 ☐ is rejected for the reasons indicated on enclosed EPO Form 2906, which is to be dispatched to the party with EPO Form 2008A.

5. ☐ The application is deemed to be withdrawn. The oral proceedings are cancelled.

Date _____

Chairman _____ Second member _____ Primary Examiner _____ Legal member _____

III. Action taken by the formalities officer

☐ EPO Form 2008A/2310A has been dispatched, if applicable (see point II above) together with EPO Form 2906/2906O.

☐ A new summons has been dispatched.

☐ .....

Date _____ Formalities Officer _____

IPR2025-01119
Belden EX1010
CS30168

NEW CLAIMS

1. A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing (23; 123) having an interior region (33; 130);

a bearing mount (71) disposed in the interior region (33; 130) of the housing (23; 123);

a cable spool (37; 137) engaged with the bearing mount (71) such that the cable spool (37; 137) selectively rotates within the housing (23; 123);

a termination module (45; 149) disposed on the cable spool (37; 137) so that the termination module (45; 149) rotates in unison with the cable spool (37; 137);

a first fiber optic cable (22; 122) wrapped about a spooling portion of the cable spool (37; 137), the first fiber optic cable (22; 122) having connectorized ends (146) that are routed to the termination module (45; 149); and

fixing means to fix the position of the cable spool (37; 137) with respect to the housing (23; 123);

characterized in that the housing (23; 123) includes a port (136) wherein a second fiber optic cable having connectorized ends can be connected to the termination module (45; 149) in the interior region (33; 130) of the housing (23; 123) and exits the housing via the port, after the cable spool (37; 137) has been fixed in position relative to the housing (23; 123).

2. A fiber optic enclosure assembly as claimed in claim 1, wherein a needle bearing is disposed on an outer surface (73) of the bearing mount (71).

3. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with a plurality of adapters (401) engaged with the adapter slot (55).

4. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes a plurality of sliding adapter modules.

5. A fiber optic enclosure assembly as claimed in claim 1, wherein the axial end (41; 136) of the cable spool (37; 137) defines a cable passage (63).

6. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that is a cable management spool (61; 161).

7. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that includes an outer radius that is larger than a minimum bend radius of the fiber optic cable.

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

providing a fiber optic enclosure including:

a housing (23; 123) defining an interior region (33; 130);

a cable spool (37; 137) disposed in the interior region (33; 130), the cable spool (37; 137) having a spooling portion (39);

a termination module (45; 149) disposed on the cable spool (37; 137);

a first fiber optic cable (22; 122) coiled around the spooling portion (39) of the cable spool (37; 137), the first fiber optic cable (22; 122) including connectorized ends (146) that are engaged with the termination module (45; 149);

and fixing means to fix the position of the cable spool (37; 137) with respect to the housing (23, 123):

rotating the cable spool (37; 137) about an axis of the housing (23; 123) of the fiber optic enclosure until a desired length of the first fiber optic cable (22; 122) is paid out;

characterized by

fixing the position of the cable spool (37; 137) with respect to the housing (23; 123) when a desired length of the first fiber optic cable (22; 122) has been paid out;

connecting a connectorized end of a second fiber optic cable to the termination module (45; 149) in the interior region (33; 130) of the fiber optic enclosure after the fixing has been carried out.

9. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the termination module (45; 149) includes a plurality of adapters (401).

10. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with the plurality of adapters (401) engaged with the adapter slot (55).

11. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9, where the termination module (45; 149) includes a plurality of sliding adapter modules.

12. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the connectorized ends (146) of a first end of the first fiber optic cable (22; 122) are connected to adapters (401) disposed in the termination module (45; 149).

13. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the housing (23; 123) is mounted to a wall.

14. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein a pin fixes the position of the cable spool (37; 137) with respect to the housing (23; 123).

European Patent Application
No. 08837186.9-1504
November 13, 2013

ADC Telecommunications, Inc.
M/MGD-354-PC/EP
BO/BM/kad

NEW CLAIMS

1. A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing (23; 123) having an interior region (33; 130);

a bearing mount (71) disposed in the interior region (33; 130) of the housing (23; 123);

a cable spool (37; 137) engaged with the bearing mount (71) such that the cable spool (37; 137) selectively rotates within the housing (23; 123);

a termination module (45; 149) disposed on the cable spool (37; 137) so that the termination module (45; 149) rotates in unison with the cable spool (37; 137);

a first fiber optic cable (22; 122) wrapped about a spooling portion of the cable spool (37; 137), the first fiber optic cable (22; 122) having connectorized ends (146) that are routed to the termination module (45; 149); and

fixing means to fix the position of the cable spool (37; 137) with respect to the housing (23; 123);

characterized in that the housing (23; 123) includes a port (136) wherein a second fiber optic cable having connectorized ends can be connected to the termination module (45; 149) in the interior region (33; 130) of the housing (23; 123) and exits the housing via the port, after the cable spool (37; 137) has been fixed in position relative to the housing (23; 123).

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2. A fiber optic enclosure assembly as claimed in claim 1, wherein a needle bearing is disposed on an outer surface (73) of the bearing mount (71).

3. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with a plurality of adapters (401) engaged with the adapter slot (55).

4. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes a plurality of sliding adapter modules.

5. A fiber optic enclosure assembly as claimed in claim 1, wherein the axial end (41; 136) of the cable spool (37; 137) defines a cable passage (63).

6. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that is a cable management spool (61; 161).

7. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that includes an outer radius that is larger than a minimum bend radius of the fiber optic cable.

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

providing a fiber optic enclosure including:

a housing (23; 123) defining an interior region (33; 130);

a cable spool (37; 137) disposed in the interior region (33; 130), the cable spool (37; 137) having a spooling portion (39);

a termination module (45; 149) disposed on the cable spool (37; 137);

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a first fiber optic cable (22; 122) coiled around the spooling portion (39) of the cable spool (37; 137), the first fiber optic cable (22; 122) including connectorized ends (146) that are engaged with the termination module (45; 149);

and fixing means to fix the position of the cable spool (37; 137) with respect to the housing (23, 123):

rotating the cable spool (37; 137) about an axis of the housing (23; 123) of the fiber optic enclosure until a desired length of the first fiber optic cable (22; 122) is paid out;

characterized by

fixing the position of the cable spool (37; 137) with respect to the housing (23; 123) when a desired length of the first fiber optic cable (22; 122) has been paid out;

connecting a connectorized end of a second fiber optic cable to the termination module (45; 149) in the interior region (33; 130) of the fiber optic enclosure after the fixing has been carried out.

9. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the termination module (45; 149) includes a plurality of adapters (401).

10. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with the plurality of adapters (401) engaged with the adapter slot (55).

11. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9, where the termination module (45; 149) includes a plurality of sliding adapter modules.

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12. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the connectorized ends (146) of a first end of the first fiber optic cable (22; 122) are connected to adapters (401) disposed in the termination module (45; 149).

13. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the housing (23; 123) is mounted to a wall.

14. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein a pin fixes the position of the cable spool (37; 137) with respect to the housing (23; 123).

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European Patent Application
No. 08837186.9-1504
November 13, 2013

ADC Telecommunications, Inc.
M/MGD-354-PC/EP
BO/BM/kad

MARKED-UP COPY OF CLAIMS

1. A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing (23; 123) having an interior region (33; 130);

a bearing mount (71) disposed in the interior region (33; 130) of the housing (23; 123);

a cable spool (37; 137) engaged with the bearing mount (71) such that the cable spool (37; 137) selectively rotates within the housing (23; 123);

a termination module (45; 149) disposed on the cable spool (37; 137) so that the termination module (45; 149) rotates in unison with the cable spool (37; 137); ~~and~~

a first fiber optic cable (22; 122) wrapped about a spooling portion of the cable spool (37; 137), the first fiber optic cable (22; 122) having connectorized ends (146) that are routed to the termination module (45; 149); and

fixing means to fix the position of the cable spool (37; 137) with respect to the housing (23; 123); [Pg. 8, lines 16-17, 19-20, and 20-22]

characterized in that the housing (23; 123) includes a port (136) ~~allowing~~ wherein a second fiber optic cable having connectorized ends can be connected to the termination module (45; 149) in the interior region (33; 130) of the housing (23; 123) ~~to~~ and exits the housing via the port [Fig. 12, 13, 14; Pg. 11, lines 8-9; Pg. 11 lines 5-9 and Fig. 12 for original characterized text], after the cable spool (37; 137) has been fixed in position relative to the housing (23; 123). [Pg. 11, lines 5-8]

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2. A fiber optic enclosure assembly as claimed in claim 1, wherein a needle bearing is disposed on an outer surface (73) of the bearing mount (71).

3. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with a plurality of adapters (401) engaged with the adapter slot (55).

4. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes a plurality of sliding adapter modules.

5. A fiber optic enclosure assembly as claimed in claim 1, wherein the axial end (41; 136) of the cable spool (37; 137) defines a cable passage (63).

6. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that is a cable management spool (61; 161).

8 ~~7~~. A method of paying out a fiber optic cable from a fiber optic enclosure, comprising:

providing a fiber optic enclosure including:

a housing (23; 123) defining an interior region (33; 130);

a cable spool (37; 137) disposed in the interior region (33; 130), the cable spool (37; 137) having a spooling portion (39);

a termination module (45; 149) disposed on the cable spool (37; 137);

a first fiber optic cable (22; 122) coiled around the spooling portion (39) of the cable spool (37; 137), the first fiber optic cable (22; 122) including connectorized ends (146) that are engaged with the termination module (45; 149);

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and fixing means to fix the position of the cable spool (37; 137) with respect to the housing (23, 123): [Pg. 8, lines 16-17, 19-20, and 20-22]

rotating the cable spool (37; 137) about an axis of the housing (23; 123) of the fiber optic enclosure until a desired length of the first fiber optic cable (22; 122) is paid out;

characterized by

fixing the position of the cable spool (37; 137) with respect to the housing (23; 123) when a desired length of the first fiber optic cable (22; 122) has been paid out; [cl. 13, original claim 16; Page 11, lines 5-8]

connecting a connectorized end of a second fiber optic cable to the termination module (45; 149) in the interior region (33; 130) of the fiber optic enclosure after the fixing has been carried out. [Pg. 11, lines 5-8]

9 ~~8~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the termination module (45; 149) includes a plurality of adapters (401).

10 ~~9~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9 ~~8~~, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with the plurality of adapters (401) engaged with the adapter slot (55).

11 ~~10~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9 ~~8~~, where the termination module (45; 149) includes a plurality of sliding adapter modules.

12 ~~11~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the connectorized ends (146) of a first end of the first fiber optic cable (22; 122) are connected to adapters (401) disposed in the termination module (45; 149).

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13 ~~12~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the housing (23; 123) is mounted to a wall.

~~13. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 7, further comprising fixing the position of the cable spool with respect to the housing when the desired length of the first fiber optic cable has been paid out.~~

14. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~13~~, wherein a pin fixes the position of the cable spool (37; 137) with respect to the housing (23; 123).

7 ~~15~~. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that includes an outer radius that is larger than a minimum bend radius of the fiber optic cable.

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MARKED-UP COPY OF CLAIMS

1. A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing (23; 123) having an interior region (33; 130);

a bearing mount (71) disposed in the interior region (33; 130) of the housing (23; 123);

a cable spool (37; 137) engaged with the bearing mount (71) such that the cable spool (37; 137) selectively rotates within the housing (23; 123);

a termination module (45; 149) disposed on the cable spool (37; 137) so that the termination module (45; 149) rotates in unison with the cable spool (37; 137); ~~and~~

a first fiber optic cable (22; 122) wrapped about a spooling portion of the cable spool (37; 137), the first fiber optic cable (22; 122) having connectorized ends (146) that are routed to the termination module (45; 149); and

fixing means to fix the position of the cable spool (37; 137) with respect to the housing (23; 123); [Pg. 8, lines 16-17, 19-20, and 20-22]

characterized in that the housing (23; 123) includes a port (136) ~~allowing~~ wherein a second fiber optic cable having connectorized ends can be connected to the termination module (45; 149) in the interior region (33; 130) of the housing (23; 123) ~~to~~ and exits the housing via the port [Fig. 12, 13, 14; Pg. 11, lines 8-9; Pg. 11 lines 5-9 and Fig. 12 for original characterized text], after the cable spool (37; 137) has been fixed in position relative to the housing (23; 123). [Pg. 11, lines 5-8]

2. A fiber optic enclosure assembly as claimed in claim 1, wherein a needle bearing is disposed on an outer surface (73) of the bearing mount (71).

3. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with a plurality of adapters (401) engaged with the adapter slot (55).

4. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes a plurality of sliding adapter modules.

5. A fiber optic enclosure assembly as claimed in claim 1, wherein the axial end (41; 136) of the cable spool (37; 137) defines a cable passage (63).

6. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that is a cable management spool (61; 161).

8 ~~7~~. A method of paying out a fiber optic cable from a fiber optic enclosure, comprising:

providing a fiber optic enclosure including:

a housing (23; 123) defining an interior region (33; 130);

a cable spool (37; 137) disposed in the interior region (33; 130), the cable spool (37; 137) having a spooling portion (39);

a termination module (45; 149) disposed on the cable spool (37; 137);

a first fiber optic cable (22; 122) coiled around the spooling portion (39) of the cable spool (37; 137), the first fiber optic cable (22; 122) including connectorized ends (146) that are engaged with the termination module (45; 149);

and fixing means to fix the position of the cable spool (37; 137) with respect to the housing (23, 123): [Pg. 8, lines 16-17, 19-20, and 20-22]

rotating the cable spool (37; 137) about an axis of the housing (23; 123) of the fiber optic enclosure until a desired length of the first fiber optic cable (22; 122) is paid out;

characterized by

fixing the position of the cable spool (37; 137) with respect to the housing (23; 123) when a desired length of the first fiber optic cable (22; 122) has been paid out; [cl. 13, original claim 16; Page 11, lines 5-8]

connecting a connectorized end of a second fiber optic cable to the termination module (45; 149) in the interior region (33; 130) of the fiber optic enclosure after the fixing has been carried out. [Pg. 11, lines 5-8]

9 ~~8~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the termination module (45; 149) includes a plurality of adapters (401).

10 ~~9~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9 ~~8~~, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with the plurality of adapters (401) engaged with the adapter slot (55).

11 ~~10~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9 ~~8~~, where the termination module (45; 149) includes a plurality of sliding adapter modules.

12 ~~11~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the connectorized ends (146) of a first end of the first fiber optic cable (22; 122) are connected to adapters (401) disposed in the termination module (45; 149).

13 ~~12~~. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~7~~, wherein the housing (23; 123) is mounted to a wall.

~~13. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 7, further comprising fixing the position of the cable spool with respect to the housing when the desired length of the first fiber optic cable has been paid out.~~

14. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8 ~~13~~, wherein a pin fixes the position of the cable spool (37; 137) with respect to the housing (23; 123).

7 ~~15~~. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that includes an outer radius that is larger than a minimum bend radius of the fiber optic cable.

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Date
14-11-2013

Reference	Application No./Patent No.
M/MGD-354-PC/EP	08837186.9 - 1504 / 2176696

Applicant/Proprietor
ADC Telecommunications, INC.

BRIEF COMMUNICATION

Oral Proceedings on 18.11.13

Subject: ☒ Your letter of 13.11.2013

Communication:
- ☒ The summons to attend oral proceedings on 18.11.13 has been cancelled.
- ☒ The procedure will be continued in writing.
- ☐ The date fixed for oral proceedings is maintained.
- ☐ A new date will be set later.
- ☐

Please take note.

For the Examining Division

Europäisches Patentamt • European Patent Office • Office européen des brevets

European patent application No. 08837186.9

II. To the Formalities Officer

1. ☐ The date / time fixed for oral proceedings is maintained.

   ☐ (if necessary) The reasons are indicated on enclosed EPO Form 2906/2906O, which is to be dispatched to the party with EPO Form 2008A/2310A.

2. ☐ At the instigation of the division the oral proceedings cannot take place on the arranged date for the reasons indicated on enclosed EPO Form 2906, which is to be dispatched to the party with EPO Form 2008A/2310A.

Date _____ Director (see Internal Instructions IE-III, 1.2) _____

3. ☒ The summons to attend oral proceedings on 18.11.13 should be cancelled.

   3.1 ☒ The proceedings will be continued in writing.

   3.2 ☐ A new date will be set later.

   3.3 ☐ A new date/time is set as follows:

   date ..... at ..... hrs.
   Parties' written submissions and amendments in preparation for the oral proceedings, if any, should be made not later than

   ..... month(s) before the date of the oral proceedings.

4. ☐ The request for the oral proceedings to be held as a videoconference

   4.1 ☐ is allowed.

   4.2 ☐ is rejected for the reasons indicated on enclosed EPO Form 2906, which is to be dispatched to the party with EPO Form 2008A.

5. ☐ The application is deemed to be withdrawn. The oral proceedings are cancelled.

14.11.2013
Date

Chairman _____ Second member _____ Primary Examiner _____ Legal member _____

III. Action taken by the formalities officer

☒ EPO Form 2008A/2310A has been dispatched, if applicable (see point II above) together with EPO Form 2906/2906O.

☐ A new summons has been dispatched.

☐ .....

14/11/13
Date

Formalities Officer _____

IPR2025-01119
Belden EX1010
CS30168

Europäisches Patentamt
European Patent Office
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Application No. : 08 837 186.9

Consultation by telephone with the applicant / representative

Despatch for information

Participants

Applicant: ADC Telecommunications, INC.

Representative: Bohnenberger, Johannes

Member(s) of the Examining Division: Verdrager, Véronique

Result of consultation

See Separate Sheet

12.11.2013
. . . . . .
Date

Verdrager, Véronique
. . . . . .
Examiner

Enclosure(s):
Email dated 12.10.2013

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Application No.	Ref.	Date
08 837 186.9 - 1504	M/MGD-354-PC/EP	10.12.2013
Applicant ADC Telecommunications, INC.		

Result of consultation

A copy of the result of consultation of 12.11.2013 is enclosed for your information.

Verdrager, Véronique
For the Examining Division

Enclosure(s): Copy of result of consultation (Form 2036)
Email dated 12.10.2013

The first examiner sent an email to the representative to submit a proposal of allowable claims.

Your ref: M/MGD-354-PC/EP
Our ref: 08837186.9-1504

Dear Mr. Bohnenberger,

1. The examining division is of the opinion that the Main Request, as well as the First and the Second Auxiliary Request filed with the letter dated 16.10.2013 do not meet the requirements of the EPC as regards novelty and inventive step.

2. Moreover, the "fixing means to fix the position of the cable spool" are considered to be essential features and should be introduced into the independent claims.

3. Therefore, the examining division suggest following formulations for independent claims 1 and 8:

1) A fiber optic enclosure assembly for enclosing optical fiber connections comprising:
a housing (23; 123) having an interior region (33; 130);
a bearing mount (71) disposed in the interior region (33; 130) of the housing (23; 123);
a cable spool (37; 137) engaged with the bearing mount (71) such that the cable spool (37; 137) selectively rotates within the housing (23; 123);
a termination module (45; 149) disposed on the cable spool (37; 137) so that the termination module (45; 149) rotates in unison with the cable spool (37; 137); ~~and~~
a first fiber optic cable (22; 122) wrapped about a spooling portion of the cable spool (37; 137), the first fiber optic cable (22; 122) having connectorized ends (146) that are routed to the termination module (45;149); and
fixing means to fix the position of the cable spool (37;137) with respect to the housing (23;123); *[see page 8, lines 19-20]*
characterized in that
the housing (23; 123) includes a port (136) wherein a second fiber optic cable having connectorized ends can be connected to the termination module (45; 149) in the interior region (33; 130) of the housing (23; 123) and exits the housing via the port after the cable spool (37;137) has been fixed in position relative to the housing (23;123). *[see page 11, lines 5-7]*

8) A method of paying out a fiber optic cable from a fiber optic enclosure, comprising:
providing a fiber optic enclosure including:
a housing (23; 123) defining an interior region (33; 130);
a cable spool (37; 137) disposed in the interior region (33; 130), the cable spool (37; 137) having a spooling portion (39);
a termination module (45; 149) disposed on the cable spool (37; 137);
a first fiber optic cable (22; 122) coiled around the spooling portion (39) of the cable spool (37; 137), the first fiber optic cable (22; 122) including connectorized ends

(146) that are engaged with the termination module;
and fixing means to fix the position of the cable spool (37;137) with respect to the housing (23;123) *[see page 8, lines 19-20];*
rotating the cable spool (37; 137) about an axis of the housing (23; 123) of the fiber optic enclosure until a desired length of the first fiber optic cable (22; 122) is paid out;
characterized by
fixing the position of the cable spool (37;137) with respect to the housing (23;123) when a desired length of the first fiber optic cable (22;122) has been paid out; *[see claim 16 as published - corresponding to claim 14 of the present Main Request - and page 11, lines 5-7]*
connecting a connectorized end of a second fiber optic cable to the termination module (45; 149) in the interior region (33; 130) of the fiber optic enclosure after the fixing has been carried out.

4. Claim 14 of an amended Main Request should be deleted to avoid redundancy with an amended claim 8.

5. It is proposed to file a single amended request, and to withdraw the Main Request, as well as the First and the Second Auxiliary Request presently on file. Otherwise, the Oral Proceedings would have to be formally held.

Best regards / Mit freundlichen Grüßen / Sincères salutations

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Please consider the environment before printing this email.

FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

Cross-Reference to Related Application

~~This application is being filed on 05 August 2008, as a PCT~~ International Patent application in the name of ADC Telecommunications, Inc., a U.S. national corporation, applicant for the designation of all countries except the U.S., and Scott C. KOWALCZYK, a citizen of the U.S., Jonathan Walter COAN, a citizen of the U.S., and Jonathan KAML, a citizen of the U.S., applicants for the designation of the U.S. only, and claims priority to U.S. Provisional Patent Application Serial No. 60/954,214 filed on 06 August 2007, U.S. Provisional Patent Application Serial No. 61/029,248 filed on 15 February 2008, and U.S. Utility ~~Patent Application Serial No. 12/182,705 filed on 30 July 2008.~~

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.

<- insert page 1a ->

~~Summary~~

exemplary device

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

EPO No. 08837186.9-1504 M/MGD-354-PC/EP

DESCRIPTION

One prior art approach is disclosed in US 6 220 413, which shows a cable storage device which has a reel rotatably mounted in a frame. A connector panel for connecting fiber optic cables fits on the reel for rotation with the reel. When lines leading to an equipment are to be connected to the connector panel, the connector panel is moved to a docking station on the reel.

SUMMARY

The present invention provides a fiber optic enclosure assembly for enclosing optical fiber connections according to independent claim 1. Further, the present invention provides a method of paying out a fiber optic cable from a fiber optic enclosure according to independent claim 8. Further advantageous embodiments of the invention may be realised according to the corresponding dependent claims.

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 exemplary method 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

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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.~~

European Patent Application
No. 08837186.9-1504
November 13, 2013

ADC Telecommunications, Inc.
M/MGD-354-PC/EP
BO/BM/kad

NEW CLAIMS

1. A fiber optic enclosure assembly for enclosing optical fiber connections comprising:

a housing (23; 123) having an interior region (33; 130);

a bearing mount (71) disposed in the interior region (33; 130) of the housing (23; 123);

a cable spool (37; 137) engaged with the bearing mount (71) such that the cable spool (37; 137) selectively rotates within the housing (23; 123);

a termination module (45; 149) disposed on the cable spool (37; 137) so that the termination module (45; 149) rotates in unison with the cable spool (37; 137);

a first fiber optic cable (22; 122) wrapped about a spooling portion of the cable spool (37; 137), the first fiber optic cable (22; 122) having connectorized ends (146) that are routed to the termination module (45; 149); and

fixing means to fix the position of the cable spool (37; 137) with respect to the housing (23; 123);

characterized in that the housing (23; 123) includes a port (136) wherein a second fiber optic cable having connectorized ends can be connected to the termination module (45; 149) in the interior region (33; 130) of the housing (23; 123) and exits the housing via the port, after the cable spool (37; 137) has been fixed in position relative to the housing (23; 123).

2. A fiber optic enclosure assembly as claimed in claim 1, wherein a needle bearing is disposed on an outer surface (73) of the bearing mount (71).

3. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with a plurality of adapters (401) engaged with the adapter slot (55).

4. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module (45; 149) includes a plurality of sliding adapter modules.

5. A fiber optic enclosure assembly as claimed in claim 1, wherein the axial end (41; 136) of the cable spool (37; 137) defines a cable passage (63).

6. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that is a cable management spool (61; 161).

7. A fiber optic enclosure assembly as claimed in claim 1, wherein the fiber optic enclosure assembly further comprises a cable manager that includes an outer radius that is larger than a minimum bend radius of the fiber optic cable.

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

providing a fiber optic enclosure including:

a housing (23; 123) defining an interior region (33; 130);

a cable spool (37; 137) disposed in the interior region (33; 130), the cable spool (37; 137) having a spooling portion (39);

a termination module (45; 149) disposed on the cable spool (37; 137);

a first fiber optic cable (22; 122) coiled around the spooling portion (39) of the cable spool (37; 137), the first fiber optic cable (22; 122) including connectorized ends (146) that are engaged with the termination module (45; 149);

and fixing means to fix the position of the cable spool (37; 137) with respect to the housing (23, 123):

rotating the cable spool (37; 137) about an axis of the housing (23; 123) of the fiber optic enclosure until a desired length of the first fiber optic cable (22; 122) is paid out;

characterized by

fixing the position of the cable spool (37; 137) with respect to the housing (23; 123) when a desired length of the first fiber optic cable (22; 122) has been paid out;

connecting a connectorized end of a second fiber optic cable to the termination module (45; 149) in the interior region (33; 130) of the fiber optic enclosure after the fixing has been carried out.

9. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the termination module (45; 149) includes a plurality of adapters (401).

10. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9, wherein the termination module (45; 149) includes an adapter plate (47; 149) having an adapter slot (55) with the plurality of adapters (401) engaged with the adapter slot (55).

11. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 9, where the termination module (45; 149) includes a plurality of sliding adapter modules.

12. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the connectorized ends (146) of a first end of the first fiber optic cable (22; 122) are connected to adapters (401) disposed in the termination module (45; 149).

13. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein the housing (23; 123) is mounted to a wall.

14. A method of paying out a fiber optic cable from a fiber optic enclosure as claimed in claim 8, wherein a pin fixes the position of the cable spool (37; 137) with respect to the housing (23; 123).

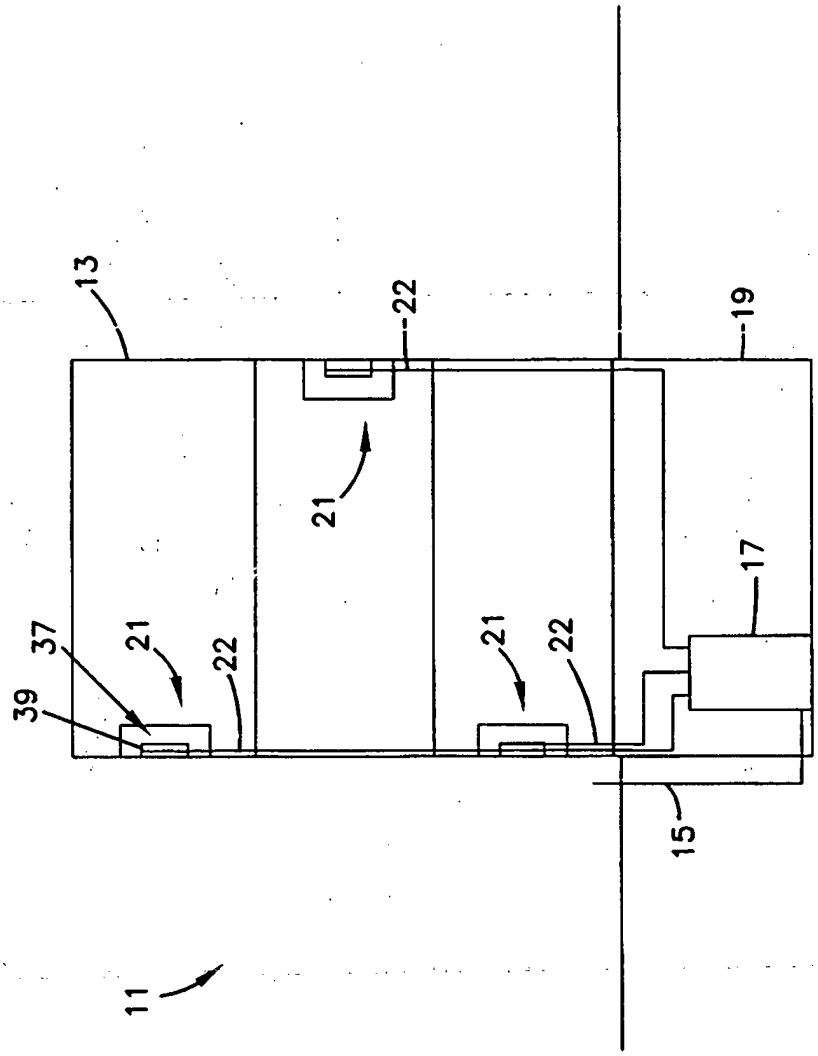


FIG. 1

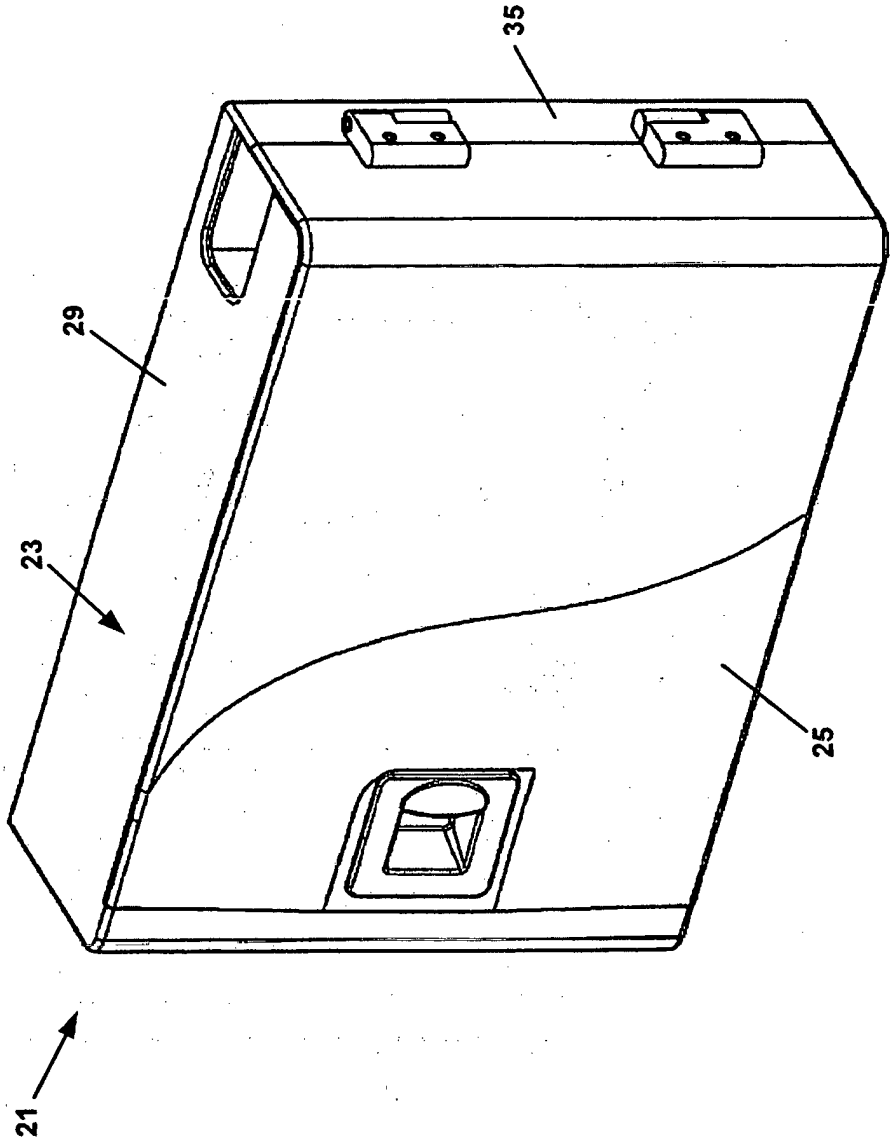


FIG. 2

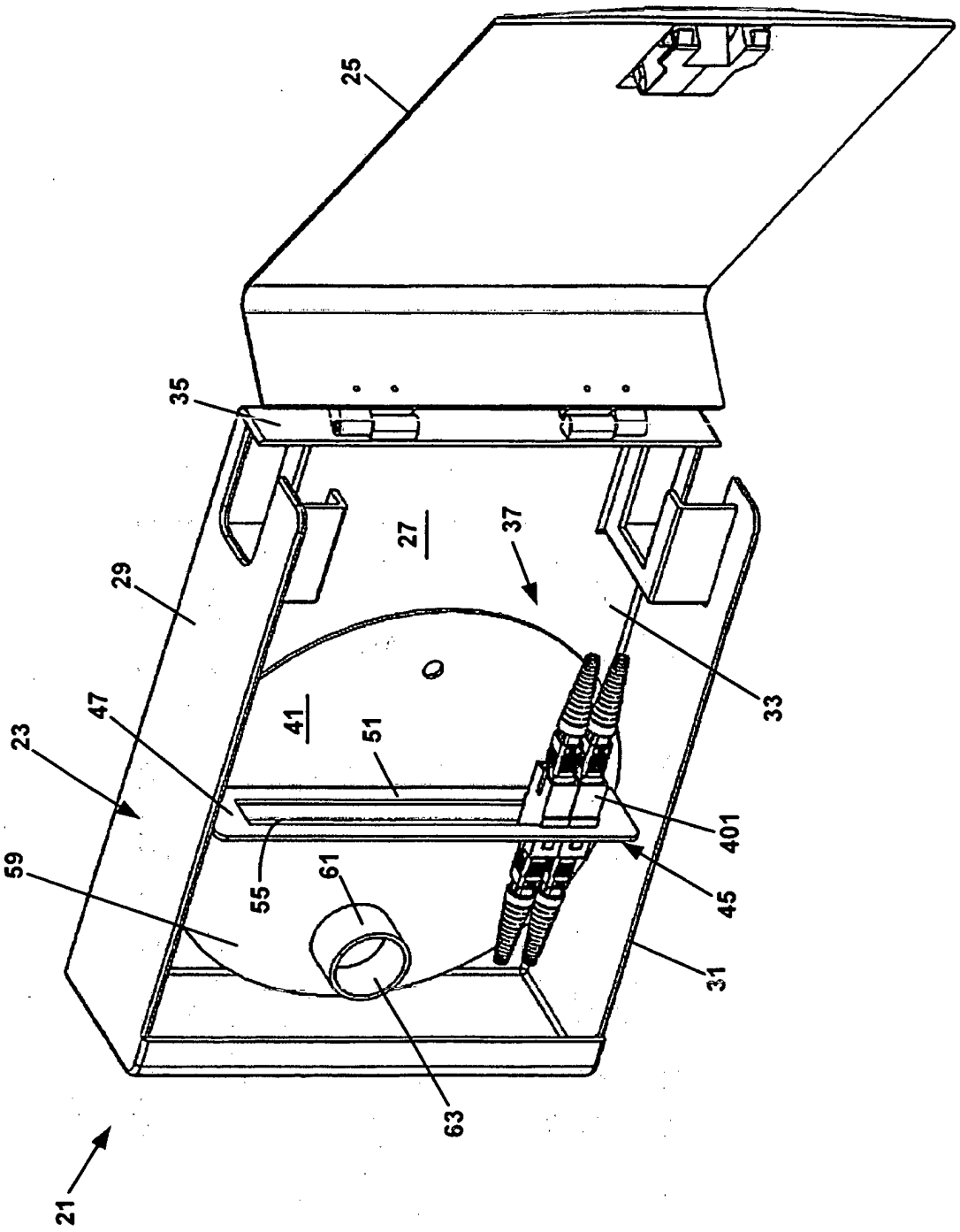


FIG. 3

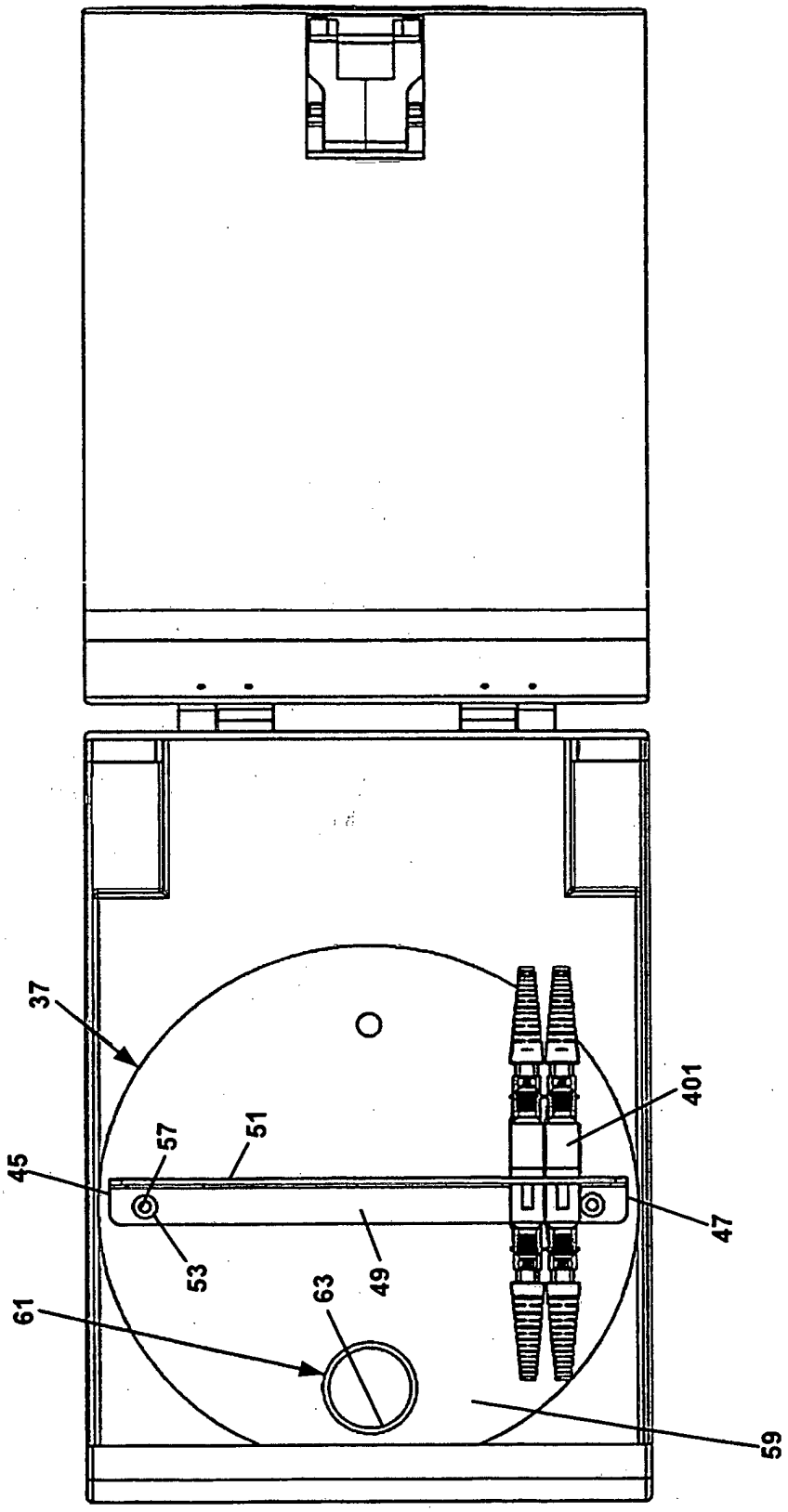


FIG. 4

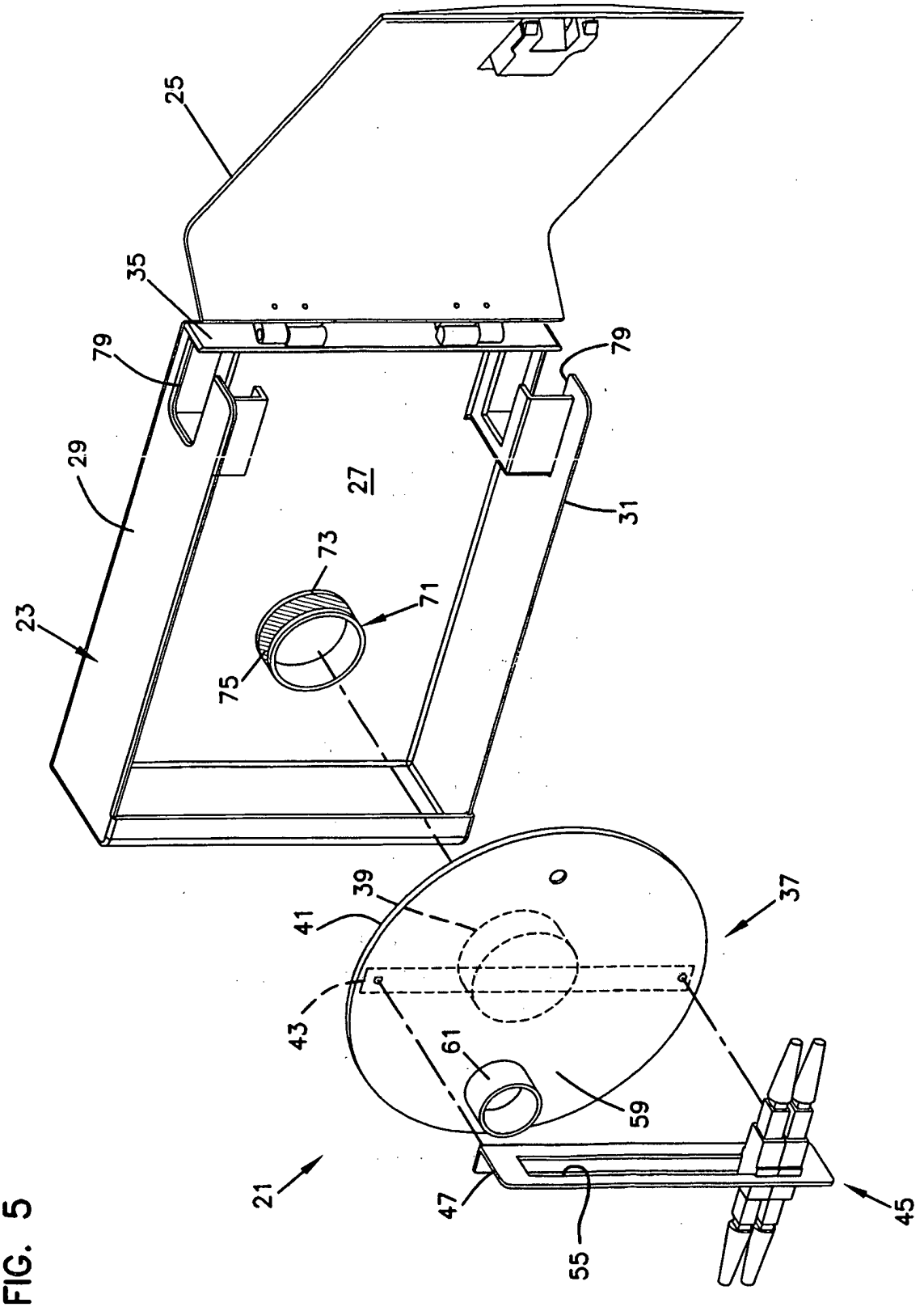


FIG. 5

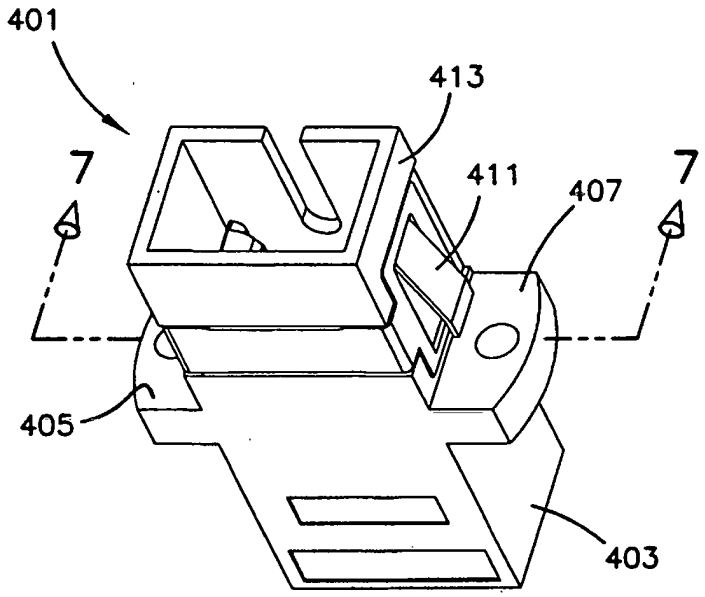


FIG. 6

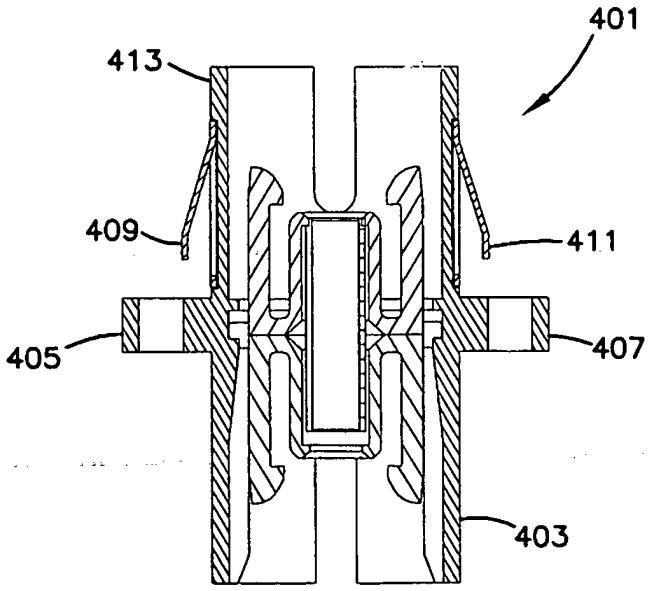


FIG. 7

FIG. 8

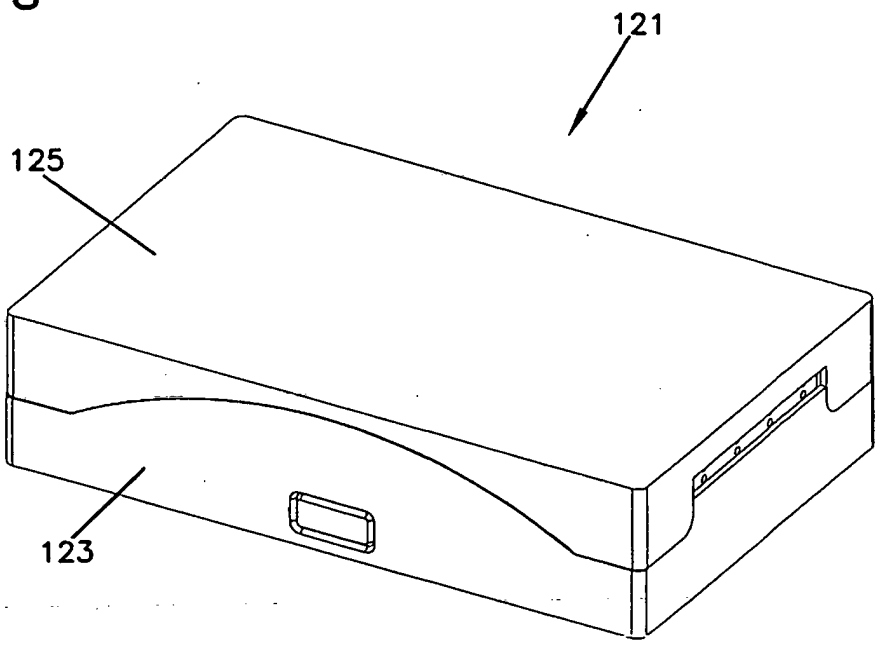


FIG. 9

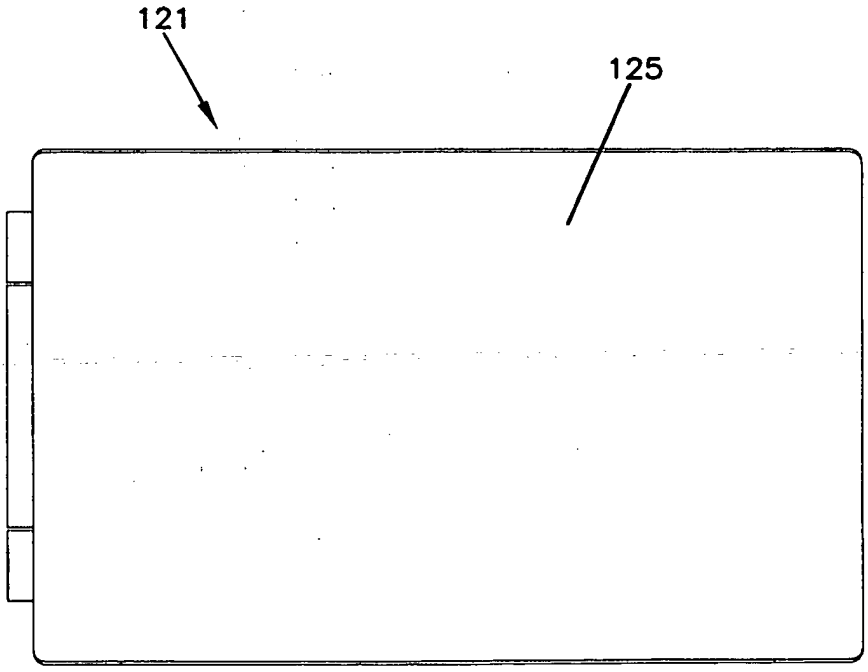


FIG. 10

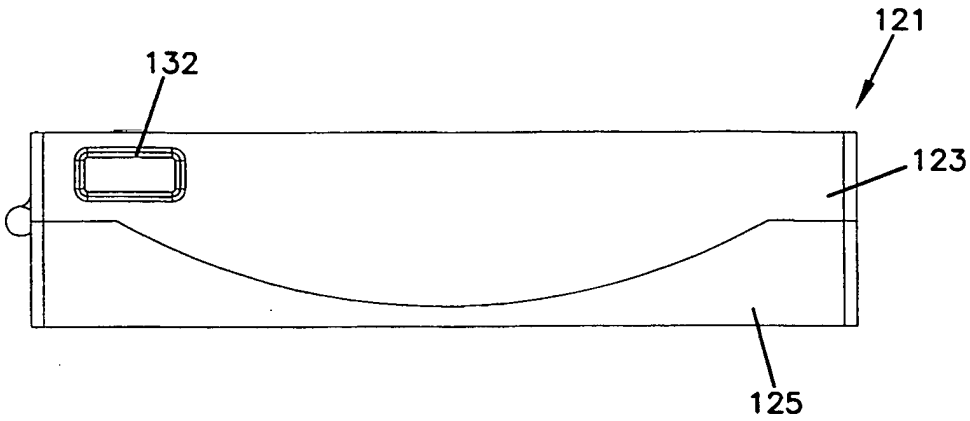


FIG. 11

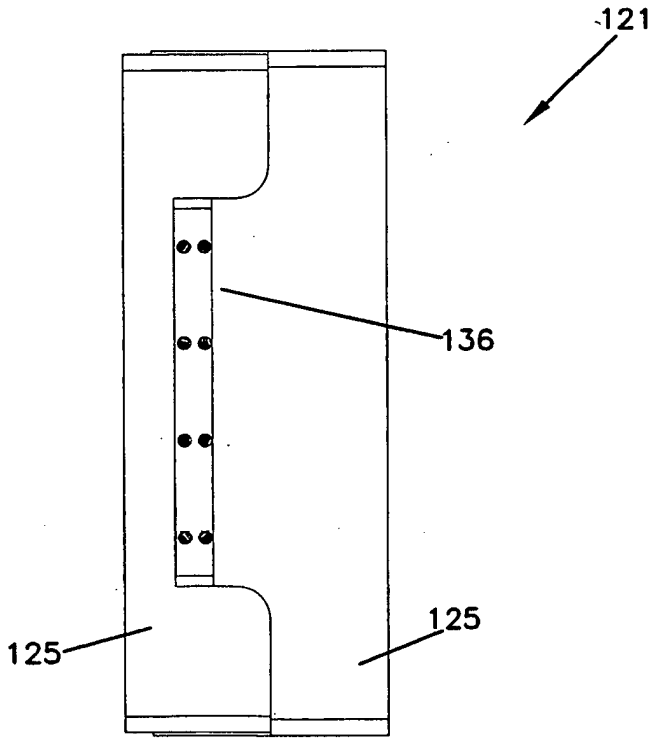


FIG. 12

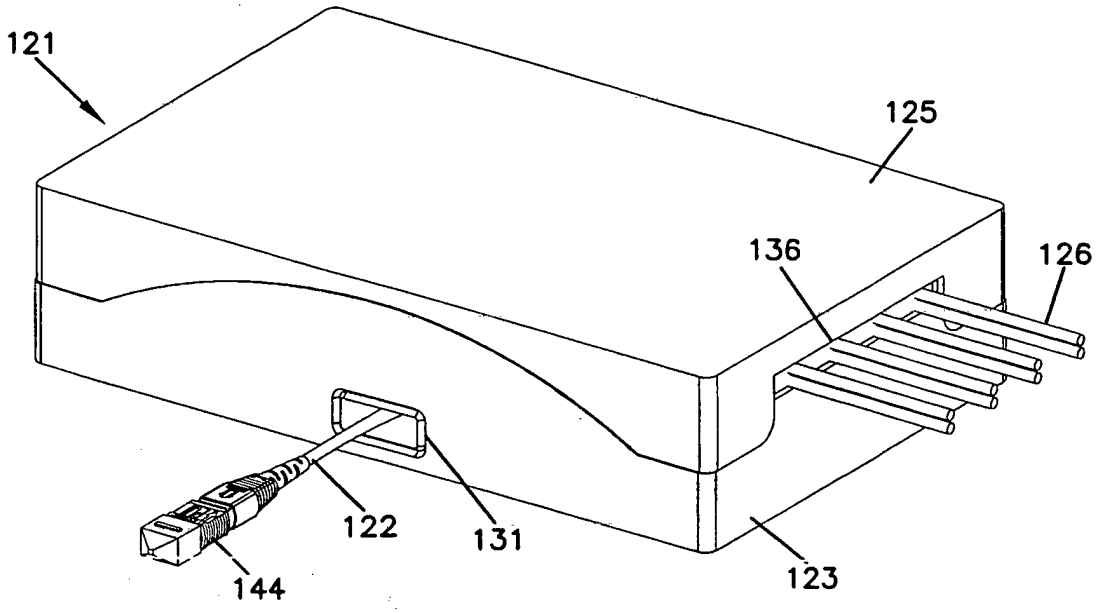
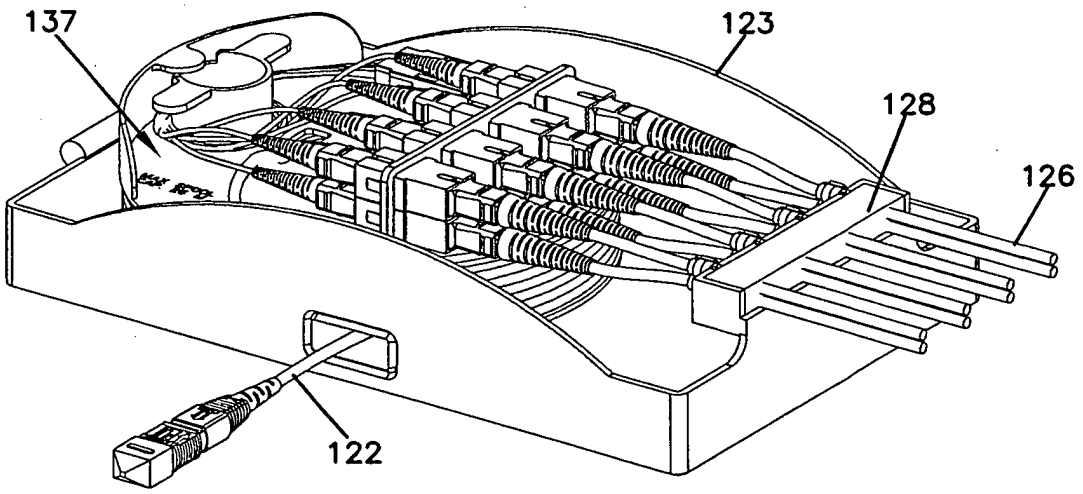


FIG. 13



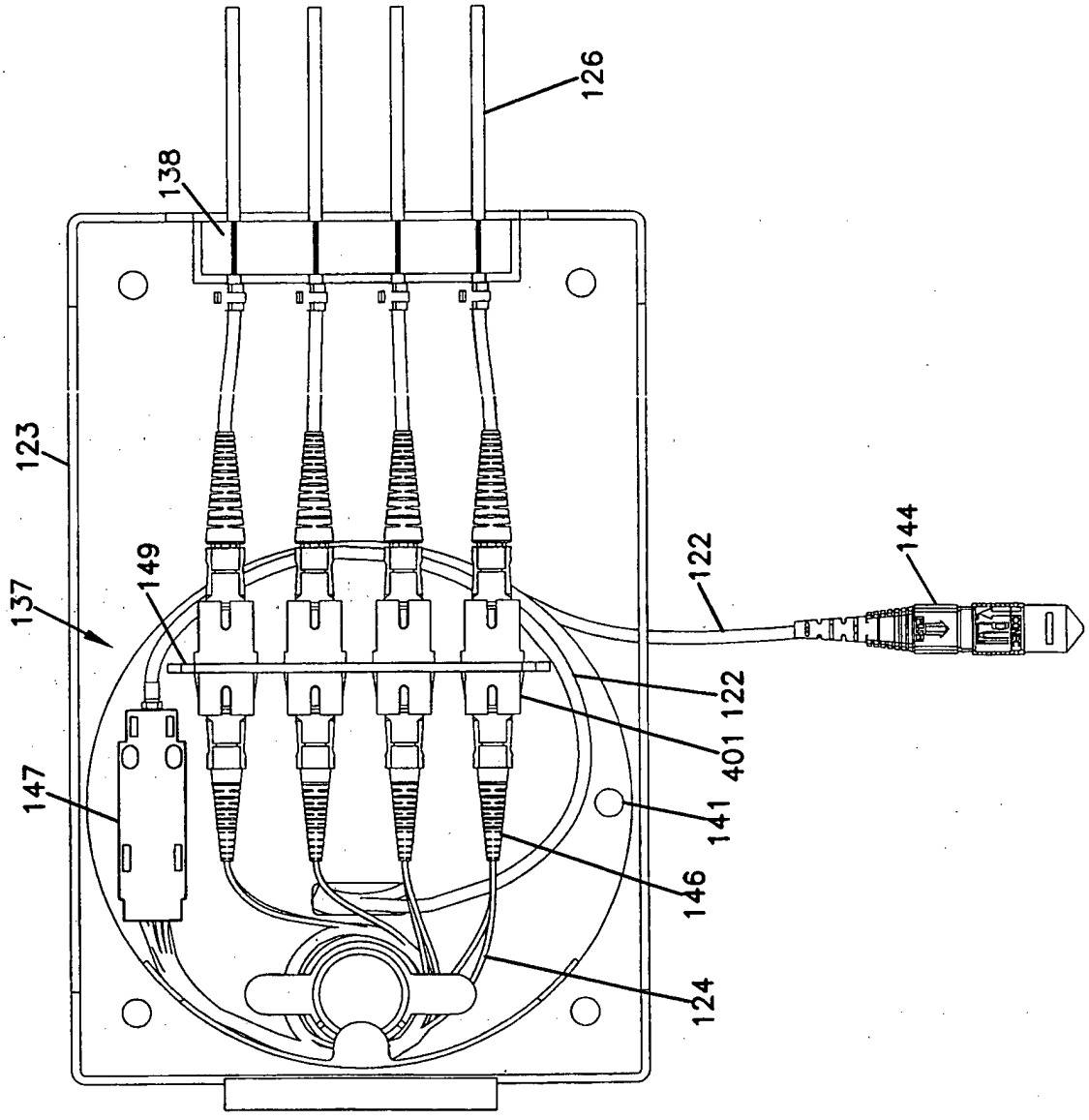


FIG. 14

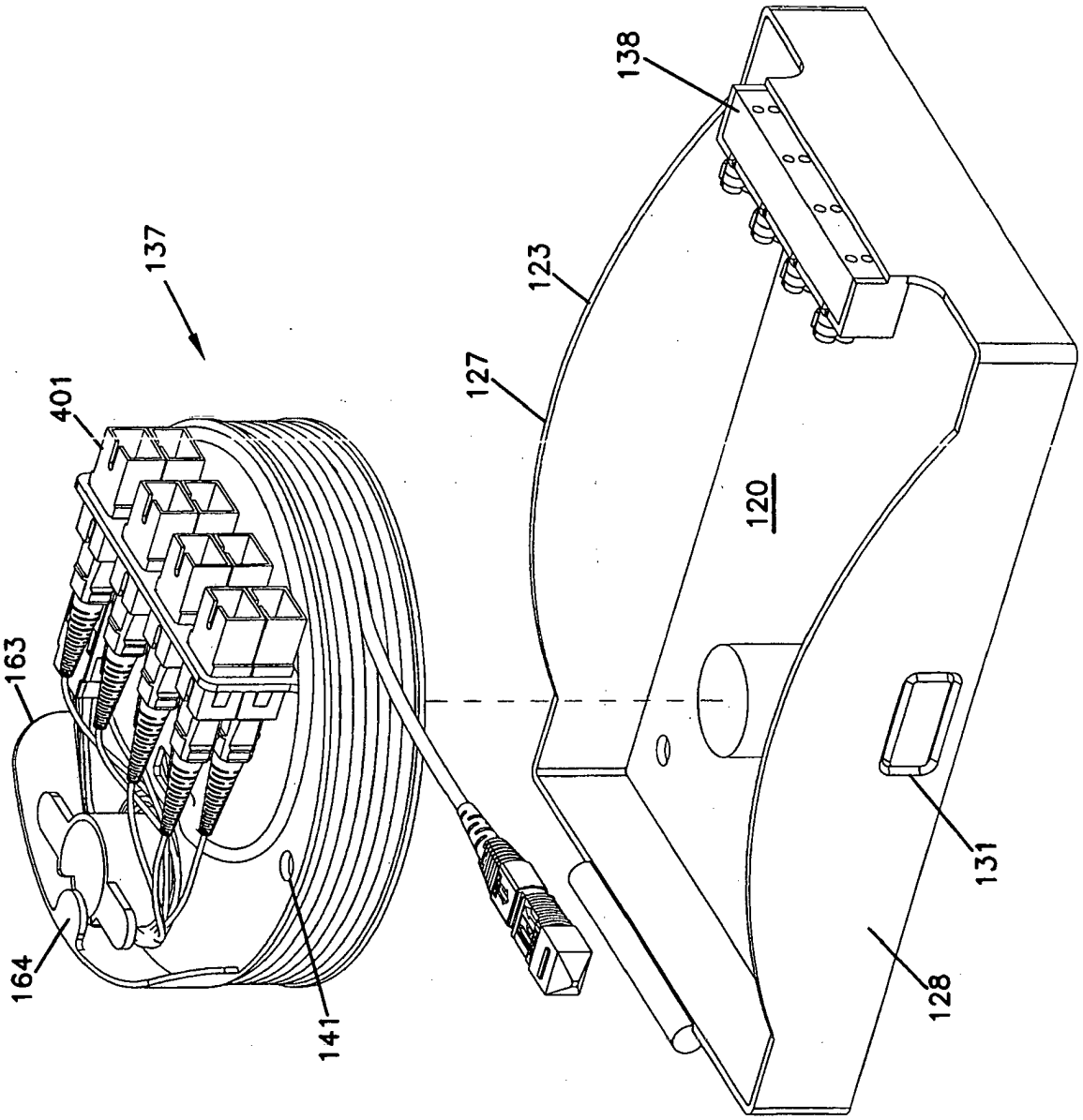


FIG. 15

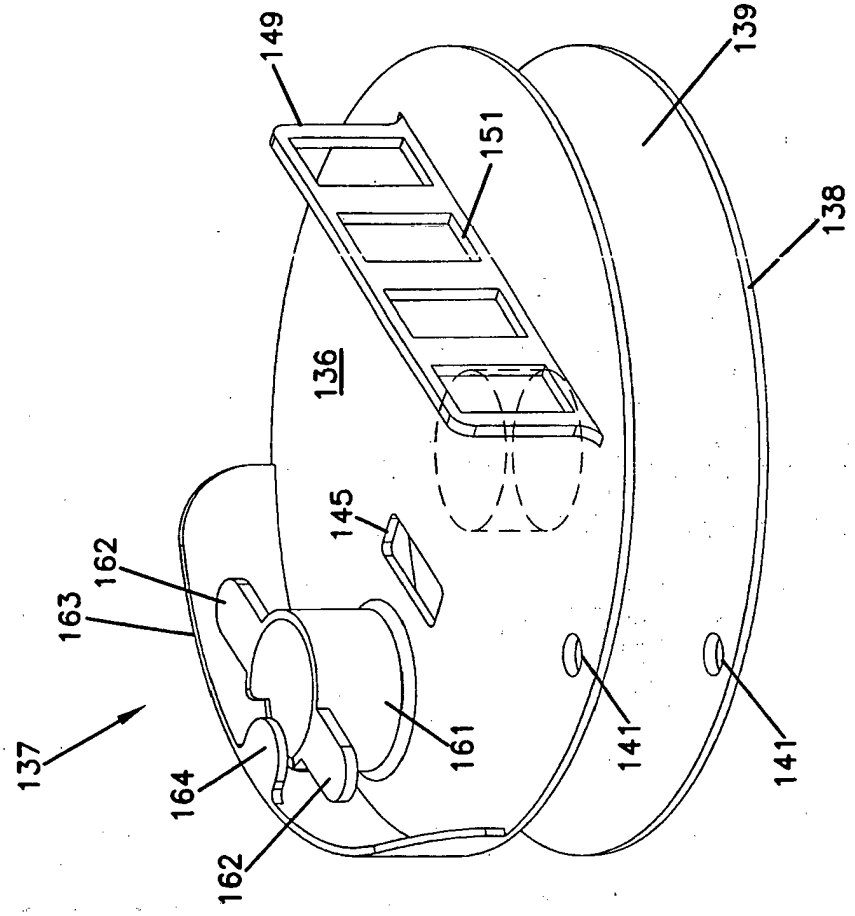


FIG. 16

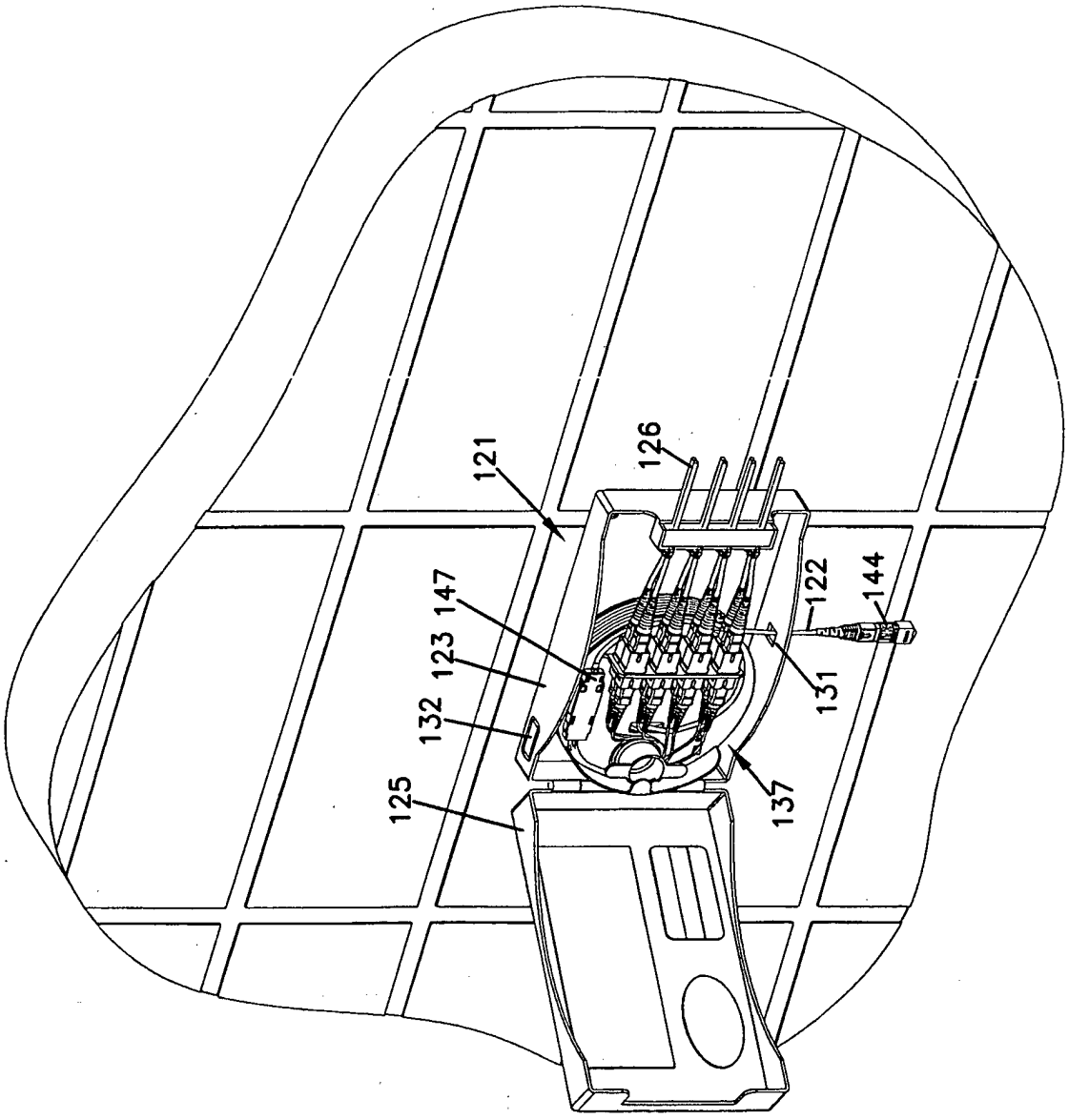
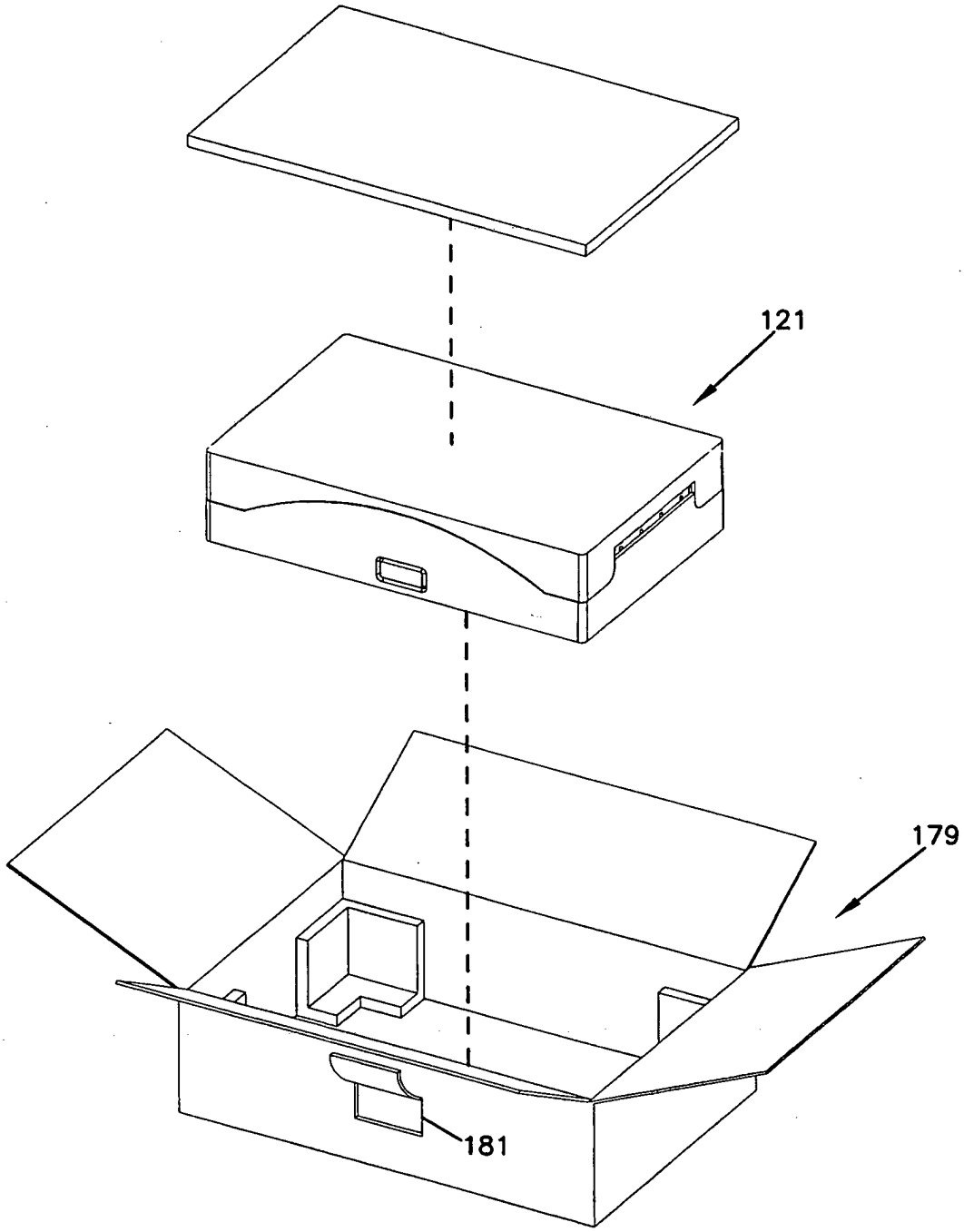


FIG. 17

FIG. 18



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GERMANY
Tel: +49 30 2590 10
Fax: +49 30 2590 1840

Application No.: 08 837 186.9

IV.2. Patent classification

The classification indicated on the published patent application remains unchanged. It is as follows:

INV. G02B6/44

IV.3. Title of the invention

The title indicated on the published patent application remains unchanged. It reads as follows:

GLASFASERGEHÄUSE MIT INTERNER KABELSPULE

FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

ENCEINTE DE FIBRE OPTIQUE À ENROULEUR DE CÂBLE EXTERNE

IV.4. Documentation

29.11.2013
Date

Andreassen, Jon
Chairman

Verdrager, Véronique
1st examiner

Hylla, Winfried
2nd examiner

Enclosure(s):

Europäisches Patentamt
European Patent Office
Office européen des brevets

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Tel: +49 30 2590 10
Fax: +49 30 2590 1840

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Meissner, Bolte & Partner GbR
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Formalities Officer
Name: Schulze, Cornelia
Tel: +49 30 25901 - 701
or call
+31 (0)70 340 45 00

Application No.	Ref.	Date
08 837 186.9 - 1504	M/MGD-354-PC/EP	17.12.2013
Applicant: ADC Telecommunications, INC.		

Communication under Rule 71(3) EPC

1. Intention to grant

You are informed that the Examining Division intends to grant a European patent on the basis of the above application with the text and drawings and the related bibliographic data as indicated below.

A copy of the relevant documents is enclosed.

1.1 In the text for the Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR

Description, Pages

3, 4, 6-10	as published			
1, 1a, 2, 5, 11	received on	17-10-2013	with letter of	16-10-2013

Claims, Numbers

1-14 filed with telefax on 13-11-2013

Drawings, Sheets

1/14-14/14 as published

1.2 Bibliographic data

The title of the invention in the three official languages of the European Patent Office, the international patent classification, the designated Contracting States, the registered name(s) of the applicant(s) and the other bibliographic data are shown on the **enclosed EPO Form 2056.**

2. Invitation

You are invited, **within a non-extendable period of four months** of notification of this communication,

2.1 to EITHER approve the text communicated above and verify the bibliographic data (R. 71(5) EPC)

(1) by filing a translation of the claim(s) in the other two official languages of the EPO

	Fee code	EUR
(2a) by paying the fee for grant including the fee for publication:	**007**	875.00
minus any amount already paid (R. 71a(5) EPC):		0.00
	Total amount:	875.00
(3) by paying additional claims fees under Rule 71(4) EPC; number of claims fees payable: 0	**016**	0.00
minus any amount already paid (R. 71a(5) EPC):		0.00
	Total amount:	0.00

Important: If the translations of the claims and fees have already been filed and paid respectively in reply to a previous communication under Rule 71(3) EPC, e.g. in the case of resumption of examination after approval (see Guidelines C-V, 6), **agreement as to the text to be granted** (R. 71a(1) EPC) must be expressed within the same time limit (e.g. by approving the text and verifying the bibliographic data, by confirming that grant proceedings can go ahead with the documents on file and/or by stating which translations of the claims already on file are to be used).

Note 1: See "Important notes concerning fee payments" below.
Note 2: Any overpaid "minus" amounts will be refunded when the decision to grant (EPO Form 2006A) has been issued.

2.2 OR, in the case of disapproval, to request reasoned amendments or corrections to the text communicated above or keep to the latest text submitted by you (R. 71(6) EPC).

In this case the translations of the claims and fee payments mentioned under point 2.1 above are NOT due.

The terms "amendment(s)" and "correction(s)" refer only to amendments or corrections of the application documents and not of other documents (e.g. bibliographic data, the designation of the inventor, etc.).

If filing amendments, you must identify them and indicate the basis for them in the application as filed. Failure to meet either requirement may lead to a communication from the Examining Division requesting that you correct this deficiency (R. 137(4) EPC).

2.3 Bibliographic data

Where you request a change or correction of bibliographic data in response to the Rule 71(3) communication, this will **not** cause the sending of a second communication under Rule 71(3) EPC. You will still have to pay the fees and file translations in reply to the Rule 71(3) communication in the case of 2.1 above, unless you also file a reasoned request for amendments or corrections in response to the Rule 71(3) communication (see case 2.2 above).

3. Loss of rights

If neither of the two possible actions above (see points 2.1 or 2.2) is performed in due time, the European patent application will be deemed to be withdrawn (R. 71(7) EPC).

4. Further procedure

4.1 In the case of point 2.1 above

4.1.1 The decision to grant the European patent will be issued, and the **mention of the grant** of the patent will be published in the European Patent Bulletin, if the requirements concerning the translation of the claims and the payment of all fees are fulfilled and there is agreement as to the text to be granted (R. 71a(1) EPC).

Note on payment of the renewal fee:
If a renewal fee becomes due before the next possible date for publication of the mention of the grant of the European patent, publication will be effected only after the renewal fee and any additional fee have been paid (R. 71a(4) EPC).

Under Article 86(2) EPC, the obligation to pay renewal fees to the European Patent Office terminates with the payment of the renewal fee due in respect of the year in which the mention of the grant of the European patent is published.

Note on payment of the designation fee(s):
If the designation fee(s) become(s) due after the communication under Rule 71(3) EPC, the mention of the grant of the European patent will not be published until the designation fee(s) has/have been paid (R. 71a(3) EPC).

4.1.2 After publication, the **European patent specification** can be downloaded free of charge from the EPO publication server https://data.epo.org/publication-server or ordered from the Vienna sub-office upon payment of a fee (OJ EPO 2005, 126).

Until 31 December 2013, each proprietor may request in writing to receive the certificate for the European patent together with one copy of the new patent specification only if the request is filed within three-month or the additional two-month period (R. 95(3) and (4) EPC). If such request has been previously filed, it has to be confirmed within the same period. The requested copy is free of charge. Any request or confirmation of a request filed after 31 December 2013 or after expiry of these periods will not be dealt with and the certificate will be delivered without a copy of the new European patent specification (cf. Notice from the European Patent Office dated 16 July 2013 concerning communication of the certificate for a European patent, OJ 2013, 418).

4.1.3 Filing of translations in the Contracting States

As regards translation requirements prescribed by the Contracting States under Article 65(1) EPC, please consult the website of the European Patent Office
www.epo.org ➞Law & practice ➞Legal texts, National law relating to the EPC
www.epo.org ➞Law & practice ➞All Legal texts ➞London Agreement

In the case of a valid extension

As regards translation requirements prescribed by the Extension States, please consult the website of the European Patent Office
www.epo.org ➞Law & practice ➞Legal texts, National law relating to the EPC

Failure to supply a prescribed translation in a Contracting State or an Extension State may result in the patent being deemed to be void *ab initio* in the State concerned (Art. 65(3) EPC).

4.2 In case of 2.2 above

If the present communication under Rule 71(3) EPC is based on an auxiliary request and, within the time limit, you maintain the main request or a higher ranking request which is not allowable, the application will be refused (Art. 97(2) EPC).

If the Examining Division gives its consent to the requested amendments or corrections, it will issue a new communication under Rule 71(3) EPC; otherwise, it shall resume the examination proceedings (R. 71(6) EPC).

5. Filing of a divisional application

Any divisional application relating to this European patent application must be filed directly with the European Patent Office in Munich, The Hague or Berlin and will be in the language of the proceedings for the present application, or if the latter was not in an official language of the EPO, the divisional application may be filed in the language of the present application as filed (see Article 76(1) and Rule 36(2) EPC). Any such divisional application must be filed while the present application is still pending and the time limit for filing divisional applications must be observed (R. 36(1) EPC; Guidelines A-IV, 1.1.1).

6. Important notes concerning fee payments

6.1 For all payments, please refer to the relevant **fee code(s).**

6.2 Automatic debiting procedure

The fee for grant, including the fee for publication, and any additional claims fees due under Rule 71(4) EPC will be debited automatically on the date of filing of the translations of the claims, or on the last day of the period of this communication. However, if the designation fee(s) become(s) due as set out in Rule 71a(3) EPC and/or a renewal fee becomes due as set out in Rule 71a(4) EPC, these should be paid separately by another permitted way of payment in order not to delay the publication of the mention of the grant. The same applies in these circumstances to the payment of extension fees. For further details see the Arrangements for the automatic debiting procedure (AAD) and accompanying information from the EPO concerning the automatic debiting procedure (Annexes A.1 and A.2 to the Arrangements for deposit accounts (ADA) in Supplement to OJ EPO 3/2009).

6.3 Important information relating to fee amounts

Following any amendment to the Rules relating to Fees, the amount(s) mentioned in this communication may be different from the amount(s) **actually due on the date of payment.** The latest version of the Schedule of fees and expenses, published as a Supplement to the Official Journal of the EPO, is also available on the EPO website (www.epo.org) and can be found under www.epo.org/schedule-of-fees, which allows the viewing, downloading and searching for individual fee amounts, both current and previous.
Please note that procedural fees are usually adjusted every two years, on even years, with effect from 1 April.

6.4 Payments by cheque delivered or sent direct to the EPO are no longer accepted as from 1 April 2008 (see OJ EPO 2007, 626).

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Page 295 of 412 Belden EX1010

Examining Division:

Chairman:	Andreassen, Jon
2nd Examiner:	Hylla, Winfried
1st Examiner:	Verdrager, Véronique

Schulze, Cornelia
For the Examining Division
Tel. No.: +49 30 25901 - 701 **Berlin sub-office**

Enclosure(s): Text intended for grant(30 pages)

EPO Form 2056

IPR2025-01119
Page 396 of 412 Belden EX1010

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European Patent Office
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European Patent Office
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GERMANY
Tel: +49 30 2590 10
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Annex to EPO Form 2004, Communication pursuant to Rule 71(3) EPC

Bibliographical data of European patent application No. 08 837 186.9

For the intended grant of the European patent, the bibliographical data are set out below, for information:

Title of invention:
- GLASFASERGEHÄUSE MIT INTERNER KABELSPULE
- FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
- ENCEINTE DE FIBRE OPTIQUE À ENROULEUR DE CÂBLE EXTERNE

Classification: INV. G02B6/44

Date of filing: 05.08.2008

Priority claimed:
US / 06.08.2007 / USP954214
US / 15.02.2008 / USA29248
US / 30.07.2008 / USA182705

Contracting States* for which fees have been paid:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR

Extension States* for which fees have been paid:

Applicant(s):**
ADC Telecommunications, INC.
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Eden Prairie, MN 55344-2552
US

Inventor(s):
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Savage, MN 55378
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COAN, Jonathan, Walter
4441 W. 134th Street
Savage, MN 55378
US

KAML, Jonathan
560 Gorman Street
Apt. 312
Shakopee, MN 55379
US

*) If the time limit for the payment of designation fees according to Rule 39(1) EPC has not yet expired and the applicant has not withdrawn any designation, **all Contracting**

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States/Extension States are currently still deemed to be designated. See also Rule 71(8) EPC and, if applicable, the above Note to users of the automatic debiting procedure.

**) If two or more applicants have designated different Contracting States, this is indicated here.

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Payment of fees and expenses

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82
10. März 2014

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Patent application/patent No. (please use a separate form for each application)

03 EP 08 837 186.9 PCT 03

	Code		Currency	Amount
04	001	Filing fee – EP direct[3]	EUR	
05	002	Search fee	EUR	
06	005	Designation fee(s)[4]	EUR	
07	015	Claims fee(s) (Rules 45(1), 162(1) EPC)[5]	EUR	
08	055	Additional copy	EUR	
09	006	Examination fee	EUR	
10	007	Fee for grant[6]	EUR	875.00
11	008	Additional fee for printing specification (more than 35 pages)[7]	EUR	
12	033	Renewal fee for the 3rd year	EUR	
13	034	Renewal fee for the 4th year	EUR	
14	035	Renewal fee for the 5th year	EUR	
15	020	Filing fee – entry EP phase[3]	EUR	
16		Extension fee(s) for[8]:	EUR	
17			EUR	
18			EUR	
19			EUR	
20			EUR	
21			EUR	
22		Total	EUR	875.00

Dr. Johannes Bohnenberger
Signature

Munich, March 10, 2014
Place, date

IPR2025-01119

Notes 1 - 8 see overleaf.

EPO 1010 09.10

PATENTANSPRÜCHE

1. Lichtwellenleiterumschließungssystem zum Umschließen von Lichtwellenleiterverbindungen, Folgendes umfassend:

ein Gehäuse (23; 123) mit einem Innenbereich (33; 130);

eine Lagerhalterung (71), die im Innenbereich (33; 130) des Gehäuses (23; 123) angeordnet ist;

eine Kabelspule (37; 137), die mit der Lagerhalterung (71) derart in Eingriff ist, dass sich die Kabelspule (37; 137) selektiv in dem Gehäuse (23; 123) dreht;

ein Anschlussmodul (45; 149), das so an der Kabelspule (37; 137) angeordnet ist, dass sich das Anschlussmodul (45; 149) in Übereinstimmung mit der Kabelspule (37; 137) dreht;

ein erstes Lichtwellenleiterkabel (22; 122), das um einen Wickelabschnitt der Kabelspule (37; 137) gewickelt ist, wobei das erste Lichtwellenleiterkabel (22; 122) vorkonfektionierte Enden (146) besitzt, die zum Anschlussmodul (45; 149) geleitet sind; und

Fixierungseinrichtungen, um die Position der Kabelspule (37; 137) im Hinblick auf das Gehäuse (23; 123) zu fixieren;

dadurch gekennzeichnet, dass das Gehäuse (23; 123) eine Anschlussöffnung (136) aufweist, wobei ein zweites Lichtwellenleiterkabel mit vorkonfektionierten Enden an das Anschlussmodul (45; 149) im Innenbereich (33; 130) des Gehäuses (23; 123) angeschlossen werden kann und über die Anschlussöffnung aus dem Gehäuse austritt, nachdem die Kabelspule (37; 137) in Bezug auf das Gehäuse (23; 123) in seiner Position fixiert wurde.

2. Lichtwellenleiterumschließungssystem nach Anspruch 1, wobei ein Nadellager an einer Außenfläche (73) der Lagerhalterung (71) angeordnet ist.

3. Lichtwellenleiterumschließungssystem nach Anspruch 1, wobei das Anschlussmodul (45; 149) eine Adapterplatte (47; 149) mit einem Adapterschlitz (55) umfasst, wobei mehrere Adapter (401) mit dem Adapterschlitz (55) in Eingriff sind.

4. Lichtwellenleiterumschließungssystem nach Anspruch 1, wobei das Anschlussmodul (45; 149) mehrere Verschiebeadaptermodule umfasst.

5. Lichtwellenleiterumschließungssystem nach Anspruch 1, wobei das axiale Ende (41; 136) der Kabelspule (37; 137) eine Kabeldurchführung (63) definiert.

6. Lichtwellenleiterumschließungssystem nach Anspruch 1, wobei das Lichtwellenleiterumschließungssystem darüber hinaus einen Kabelmanager aufweist, bei dem es sich um eine Kabelführungsspule (61; 161) handelt.

7. Lichtwellenleiterumschließungssystem nach Anspruch 1, wobei das Lichtwellenleiterumschließungssystem darüber hinaus einen Kabelmanager aufweist, der einen Außenradius hat, der größer ist als ein Mindestbiegeradius des Lichtwellenleiterkabels.

8. Verfahren zum Ausgeben eines Lichtwellenleiterkabels aus einer Lichtwellenleiterumschließung, Folgendes umfassend:

Bereitstellen einer Lichtwellenleiterumschließung, die Folgendes aufweist:

ein Gehäuse (23; 123), das einen Innenbereich (33; 130) definiert;

eine Kabelspule (37; 137), die im Innenbereich (33; 130) angeordnet ist, wobei die Kabelspule (37; 137) einen Wickelabschnitt (39) besitzt;

ein Anschlussmodul (45; 149), das an der Kabelspule (37; 137) angeordnet ist;

ein erstes Lichtwellenleiterkabel (22; 122), das um den Spulenabschnitt (39) der Kabelspule (37; 137) aufgewickelt ist, wobei das erste Lichtwellenleiterkabel (22; 122) vorkonfektionierte Enden (146) aufweist, die mit dem Anschlussmodul (45; 149) in Eingriff sind;

und Fixierungseinrichtungen, um die Position der Kabelspule (37; 137) im Hinblick auf das Gehäuse (23; 123) zu fixieren:

Drehen der Kabelspule (37; 137) um eine Achse des Gehäuses (23; 123) der Lichtwellenleiterumschließung, bis eine gewünschte Länge des ersten Lichtwellenleiterkabels (22; 122) ausgegeben ist;

gekennzeichnet durch

Fixieren der Position der Kabelspule (37; 137) im Hinblick auf das Gehäuse (23; 123), wenn eine gewünschte Länge des ersten Lichtwellenleiterkabels (22; 122) ausgegeben wurde;

Anschließen eines vorkonfektionierten Endes eines zweiten Lichtwellenleiterkabels an das Anschlussmodul (45; 149) im Innenbereich (33; 130) der Lichtwellenleiterumschließung, nachdem das Fixieren durchgeführt wurde.

9. Verfahren zum Ausgeben eines Lichtwellenleiterkabels aus einer Lichtwellenleiterumschließung wie in Anspruch 8 beansprucht, wobei das Anschlussmodul (45; 149) mehrere Adapter (401) aufweist.

10. Verfahren zum Ausgeben eines Lichtwellenleiterkabels aus einer Lichtwellenleiterumschließung wie in Anspruch 9 beansprucht, wobei das Anschlussmodul (45; 149) eine Adapterplatte (47; 149) mit einem Adapterschlitz (55) umfasst, wobei die mehreren Adapter (401) mit dem Adapterschlitz (55) in Eingriff sind.

11. Verfahren zum Ausgeben eines Lichtwellenleiterkabels aus einer Lichtwellenleiterumschließung wie in Anspruch 9 beansprucht, wobei das Anschlussmodul (45; 149) mehrere Schiebeadaptermodule umfasst.

12. Verfahren zum Ausgeben eines Lichtwellenleiterkabels aus einer Lichtwellenleiterumschließung wie in Anspruch 8 beansprucht, wobei die vorkonfektionierten Enden (146) eines ersten Endes des ersten Lichtwellenleiterkabels (22; 122) an Adapter (401) angeschlossen werden, die im Anschlussmodul (45; 149) angeordnet sind.

13. Verfahren zum Ausgeben eines Lichtwellenleiterkabels aus einer Lichtwellenleiterumschließung wie in Anspruch 8 beansprucht, wobei das Gehäuse (23; 123) an einer Wand montiert ist.

14. Verfahren zum Ausgeben eines Lichtwellenleiterkabels aus einer Lichtwellenleiterumschließung wie in Anspruch 8 beansprucht, wobei ein Stift die Position der Kabelspule (37; 137) im Hinblick auf das Gehäuse (23; 123) fixiert.

REVENDICATIONS

1. Ensemble d'enceinte de fibre optique pour enfermer des connexions de fibre optique, comprenant :

un boîtier (23 ; 123) ayant une région intérieure (33 ; 130) ;

un montant de roulement (71) disposé dans la région intérieure (33 ; 130) du boîtier (23 ; 123) ;

une bobine de câble (37 ; 137) mise en prise avec le montant de roulement (71) de sorte que la bobine de câble (37 ; 137) tourne sélectivement à l'intérieur du boîtier (23 ; 123) ;

un module de terminaison (45 ; 149) disposé sur la bobine de câble (37, 137) de sorte que le module de terminaison (45 ; 149) tourne à l'unisson avec la bobine de câble (37 ; 137) ;

un premier câble à fibre optique (22 ; 122) enroulé autour d'une partie de bobinage de la bobine de câble (37 ; 137), le premier câble à fibre optique (22 ; 122) ayant des extrémités de connecteur (146) qui sont acheminées vers le module de terminaison (45 ; 149) ; et

des moyens de fixation pour fixer la position de la bobine de câble (37 ; 137) par rapport au boîtier (23 ; 123) ;

caractérisé en ce que le boîtier (23 ; 123) comprend un orifice (136), dans lequel un second câble à fibre optique ayant des extrémités de connecteur peut être raccordé au module de terminaison (45 ; 149) dans la région intérieure (33 ; 130) du boîtier (23 ; 123) et sort du boîtier via l'orifice, après que la bobine de câble (37 ; 137) a été fixée en position par rapport au boîtier (23 ; 123).

2. Ensemble d'enceinte de fibre optique selon la revendication 1, dans lequel un roulement à aiguilles est

disposé sur une surface externe (73) du montant de roulement (71).

3. Ensemble d'enceinte de fibre optique selon la revendication 1, dans lequel le module de terminaison (45 ; 149) comprend une plaque d'adaptateur (47 ; 149) ayant une fente d'adaptateur (55) avec une pluralité d'adaptateurs (401) mis en prise avec la fente d'adaptateur (55).

4. Ensemble d'enceinte de fibre optique selon la revendication 1, dans lequel le module de terminaison (45 ; 149) comprend une pluralité de modules d'adaptateur coulissants.

5. Ensemble d'enceinte de fibre optique selon la revendication 1, dans lequel l'extrémité axiale (41 ; 136) de la bobine de câble (37 ; 137) défini un passage de câble (63).

6. Ensemble d'enceinte de fibre optique selon la revendication 1, dans lequel l'ensemble d'enceinte de fibre optique comprend en outre un gestionnaire de câble qui est une bobine de gestion de câble (61 ; 161).

7. Ensemble d'enceinte de fibre optique selon la revendication 1, dans lequel l'ensemble d'enceinte de fibre optique comprend en outre un gestionnaire de câble qui comprend un rayon externe qui est supérieur à un rayon de flexion minimum du câble à fibre optique.

8. Procédé pour dérouler un câble à fibre optique d'une enceinte de fibre optique, comprenant les étapes consistant à :

prévoir une enceinte de fibre optique comprenant :

un boîtier (23 ; 123) définissant une région intérieure (33 ; 130) ;

une bobine de câble (37 ; 137) disposée dans la région intérieure (33 ; 130), la bobine de câble (37 ; 137) ayant une partie de bobinage (39) ;

un module de terminaison (45 ; 149) disposé sur la bobine de câble (37 ; 137) ;

un premier câble à fibre optique (22 ; 122) enroulé autour de la partie de bobinage (39) de la bobine de câble (37 ; 137), le premier câble à fibre optique (22 ; 122) comprenant des extrémités de connecteur (146) qui sont mises en prise avec le module de terminaison (45 ; 149) ;

et des moyens de fixation pour fixer la position de la bobine de câble (37 ; 137) par rapport au boîtier (23, 123) ;

faire tourner la bobine de câble (37 ; 137) autour d'un axe du boîtier (23 ; 123) de l'enceinte de fibre optique jusqu'à ce qu'une longueur souhaitée du premier câble à fibre optique (22 ; 122) soit déroulée ;

caractérisé par les étapes consistant à :

fixer la position de la bobine de câble (37 ; 137) par rapport au boîtier (23 ; 123) lorsqu'une longueur souhaitée du premier câble à fibre optique (22 ; 122) a été déroulée ;

raccorder une extrémité de connecteur d'un second câble à fibre optique au module de terminaison (45 ; 149) dans la région intérieure (33 ; 130) de l'enceinte de fibre optique après avoir réalisé la fixation.

9. Procédé pour dérouler un câble à fibre optique d'une enceinte de fibre optique selon la revendication 8, dans lequel le module de terminaison (45 ; 149) comprend une pluralité d'adaptateurs (401).

10. Procédé pour dérouler un câble à fibre optique d'une enceinte de fibre optique selon la revendication 9, dans lequel le module de terminaison (45 ; 149) comprend une plaque d'adaptateur (47 ; 149) ayant une fente d'adaptateur (55) avec la pluralité d'adaptateurs (401) mis en prise avec la fente d'adaptateur (55).

11. Procédé pour dérouler un câble à fibre optique d'une enceinte de fibre optique selon la revendication 9, dans lequel le module de terminaison (45 ; 149) comprend une pluralité de modules d'adaptateur coulissants.

12. Procédé pour dérouler un câble à fibre optique d'une enceinte de fibre optique selon la revendication 8, dans lequel les extrémités de connecteur (146) d'une première extrémité du premier câble à fibre optique (22 ; 122) sont raccordées aux adaptateurs (401) disposés dans le module de terminaison (45 ; 149).

13. Procédé pour dérouler un câble à fibre optique d'une enceinte de fibre optique selon la revendication 8, dans lequel le boîtier (23 ; 123) est monté sur une paroi.

14. Procédé pour dérouler un câble à fibre optique d'une enceinte de fibre optique selon la revendication 8, dans lequel une broche fixe la position de la bobine de câble (37 ; 137) par rapport au boîtier (23 ; 123).

MEISSNER BOLTE

EPO - Munich
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10. März 2014

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European Trademark Attorneys
European Design Attorneys
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European Patent Office

80298 München

Datum Date	Ihr Zeichen Your ref.	Unser Zeichen Our ref.	Ihr Ansprechpartner Your contact
March 10, 2014 BO/st	08837186.9-1504	M/MGD-354-PC/EP	Dr. J. Bohnenberger

European Patent Application No. 08837186.9-1504
FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL
ADC Telecommunications, Inc.

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ip_law@mbp.®

Dear Madam/Sir,

In response to the Communication under Rule 71(3) EPC dated December 17, 2013 we would like to confirm that the Applicant approves the documents intended for grant.

Accordingly, we herewith enclose a German and a French translation of the allowable patent claims. Furthermore, we herewith request that the official fees for grant and printing in the amount of EUR **875,00** be deducted from our deposit account No. 2800.0438.

We herewith request that Zur Kasse

- the Decision to Grant be issued and the certificate of the European Patent be supplied.

Yours faithfully,

Dr. Johannes Bohnenberger
European Patent Attorney

Enclosures:
- German translation of the claims
- French translation of the claims
- Voucher for the settlement of fees

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European Patent Office
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Meissner, Bolte & Partner GbR
Postfach 86 06 24
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ALLEMAGNE

Date: 27.03.14

Reference	Application No./Patent No.
M/MGD-354-PC/EP	08837186.9 - 1504 / 2176696

Applicant/Proprietor
ADC Telecommunications, INC.

Decision to grant a European patent pursuant to Article 97(1) EPC

Following examination of European patent application No. 08837186.9 a European patent with the title and the supporting documents indicated in the communication pursuant to Rule 71(3) EPC dated 17.12.13 is hereby granted in respect of the designated Contracting States.

Patent No. : 2176696
Date of filing : 05.08.08
Priority claimed : 06.08.07/USP 954214
15.02.08/USA 29248
30.07.08/USA 182705

Designated Contracting States and Proprietor(s) : AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR
ADC Telecommunications, INC.
13625 Technology Drive
Eden Prairie, MN 55344-2552/US

This decision will take effect on the date on which the European Patent Bulletin mentions the grant (Art. 97(3) EPC).

The mention of the grant will be published in European Patent Bulletin 14/17 of 23.04.14.

Examining Division

Verdrager V Hylla W Andreassen J

Europäisches Patentamt • European Patent Office • Office européen des brevets

Registered letter
EPO Form 2006A 12.07 (20/03/14)

IPR2025-01119
Belden EX1010
to EPO postal service: 21.03.14

ANMERKUNG ZUR ENTSCHEIDUNG ÜBER DIE ERTEILUNG
EINES EUROPÄISCHEN PATENTS (EPA Form 2006)

1. **EPA Informationsbroschüre "Nationales Recht zum EPÜ"**
Diese Broschüre enthält nützliche Informationen zu den formalen Erfordernissen und den Handlungen, die vor den Patentbehörden der Vertragsstaaten vorzunehmen sind, um Rechte in diesen Staaten zu erlangen. Da diese Handlungen einem ständigen Wandel unterworfen sind, sollte immer nur die neueste Ausgabe der Broschüre benutzt werden. Nachträgliche Informationen werden im Amtsblatt veröffentlicht.

2. **Übersetzung der europäischen Patentschrift nach Artikel 65 (1) des Europäischen Patentübereinkommens**
Sie werden erneut darauf hingewiesen, dass bestimmte Vertragsstaaten nach Artikel 65 (1) EPÜ eine Übersetzung der europäischen Patentschrift verlangen; hierauf wird in der Mitteilung gemäß Regel 71 (5) EPÜ verwiesen. Die Nichteinreichung dieser Übersetzung kann zur Folge haben, dass das Patent in dem betreffenden Staat/in den betreffenden Staaten als von Anfang an nicht eingetreten gilt. Weitere Einzelheiten entnehmen Sie bitte der oben genannten Broschüre.

3. **Zahlung von Jahresgebühren für europäische Patente**
Nach Artikel 141 EPÜ können "nationale" Jahresgebühren für das europäische Patent für die Jahre erhoben werden, die an das Jahr anschließen, in dem der Hinweis auf die Erteilung des europäischen Patents im "Europäischen Patentblatt" bekanntgemacht wird. Weitere Einzelheiten entnehmen Sie bitte der oben genannten Broschüre.

NOTE RELATING TO THE DECISION TO GRANT A
EUROPEAN PATENT (EPO Form 2006)

1. **EPO Information Brochure "National law relating to the EPC"**
This brochure provides useful information regarding formal requirements and the steps to be taken before the patent authorities of the Contracting States in order to acquire rights in those states. Since the necessary steps are subject to change the latest edition of the brochure should always be used. Subsequent information is published In the Official Journal.

2. **Translation of the European patent application under Article 65(1) of the European Patent Convention**
Your attention is again drawn to the requirements regarding translation of the European patent specification laid down by a number of Contracting States under Article 65(1) EPC, to which reference is made in the communication under Rule 71(5) EPC. Failure to supply such translation(s) may result in the patent being deemed to be void "ab initio" in the State(s) in question. For further details you are recommended to consult the above-mentioned brochure.

3. **Payment of renewal fees for European patents**
Under Article 141 EPC "national" renewal fees in respect of a European patent may be imposed for the years which follow that in which the mention of the grant of the European patent is published in the "European Patent Bulletin". For further details you are recommended to consult the above-mentioned brochure.

REMARQUE RELATIVE A LA DECISION DE DELIVRANCE
D'UN BREVET EUROPEEN (OEB Form 2006)

1. **Brochure d'information de l'OEB "Droit national relatif à la CBE"**
Cette brochure fournit d'utiles renseignements sur les conditions de forme requises et sur les actes à accomplir auprès des offices de brevet des Etats contractants aux fins d'obtenir des droits dans les Etats contractants. Etant donné que les actes indispensables sont susceptibles de modifications, il serait bon de toujours consulter la dernière édition de la brochure. Toute information ultérieure est publiée au Journal Officiel.

2. **Traduction du fascicule du brevet européen en vertu de l'article 65(1) de la Convention sur le brevet européen**
Votre attention est de nouveau attirée sur l'obligation faite par certains Etats contractants, en vertu de l'article 65(1) CBE, da fournir une traduction du fascicule du brevet européen, à laquelle il est fait référence dans la notification établie conformément à la règle 71(5) CBE. Si la(les) traduction(s) n'est(ne sont) pas fournie(s), le brevet européen peut, dès l'origine, être réputé sans effet dans cet(ces) Etat(s). Pour plus de détails, nous vous renvoyons à la brochure susmentionnée.

3. **Paiement des taxes annuelles pour le brevet européen**
Conformément à l'article 141 CBE des taxes annuelles "nationales" dues au titre du brevet européen peuvent être perçues pour les années suivant celle au cours de laquelle la mention de la délivrance du brevet européen est publiée au "Bulletin européen des brevets. Pour plus de détails, nous vous renvoyons à la brochure susmentionnée.

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Date
23.04.14

Reference	Application No./Patent No.
M/MGD-354-PC/EP	08837186.9 - 1504 / 2176696
Applicant/Proprietor	
ADC Telecommunications, INC.	

Transmission of the certificate for a European patent pursuant to Rule 74 EPC

The certificate for a European patent is herewith transmitted.

The European patent specification can be downloaded from the EPO publication server **https://data.epo.org/publication-server/** (see OJ EPO 2005, 126).

Note:
A corrected title page of the European patent specification will be published, if the bibliographic data have been changed after completion of the technical preparations.

For the Examining Division

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Date
27.02.15

Reference	Application No./Patent No.
M/MGD-354-PC/EP	08837186.9 - 1504 / 2176696
Applicant/Proprietor	
ADC Telecommunications, INC.	

Communication regarding the expiry of the time limit within which notice of opposition may be filed

You are hereby informed that on expiry of the nine-month time limit from the publication of the mention of the grant of European patent No. 2176696 no notice of opposition had reached the files.

The entry in the Register of European Patents will be automatically generated by the electronic data processing system.

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