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Table with 7 columns: APPLICATION NUMBER, FILING or 371(c) DATE, GRP ART UNIT, FIL FEE REC'D, ATTY.DOCKET.NO, TOT CLAIMS, IND CLAIMS. Values: 60/954,214, 08/06/2007, 200, 2316.2584USP3

CONFIRMATION NO. 9722

FILING RECEIPT

23552
MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN55402-0903

Date Mailed: 08/16/2007

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

Applicant(s)

Scott C. Kowalczyk, Savage, MN;
Jonathan Walter Coan, Savage, MN;

Power of Attorney: The patent practitioners associated with Customer Number 23552

If Required, Foreign Filing License Granted: 08/15/2007

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is US60/954,214

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

Non-Publication Request: No

Early Publication Request: No

Title

FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

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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):

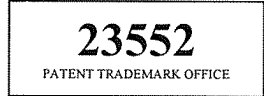
Full Name Of Inventor	Family Name Kowalczyk	First Given Name Scott	Second Given Name C.
Residence & Citizenship	City Savage	State or Foreign Country Minnesota	Country of Citizenship USA
Post Office Address	Post Office Address 7628 Southridge Court	City Savage	State & Zip Code/Country Minnesota 55378/ 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. 134 th 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 \$.
 - Please charge Deposit Account No. 13-2725.
 - PAYMENT OF THE FILING FEE IS BEING DEFERRED.
4. The Commissioner is hereby authorized to charge any additional fees as set forth in 37 CFR §§ 1.16 to 1.18 which may be required by this paper or credit any overpayment to Account No. 13-2725.
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:
7. The invention was made by the following agency of the United States Government or under a contract with the following agency of the United States Government:

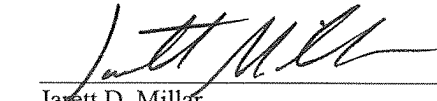
8. Address all future communications to the **Attention of Jarett D. Millar** (may only be completed by attorney or agent of record) at the address below.

Respectfully submitted,

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



Date: August 6, 2007



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

FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL

Technical Field

5 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
10 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
15 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
20 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
25 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
5 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.

10 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.

15 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.

20 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
25 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 41 of 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.

5 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.

10 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
15 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.

20 Various modifications and alterations of this disclosure will become apparent to those skilled in the art without departing from the scope and spirit of this disclosure, and it should be understood that the inventive scope of this disclosure is not to be unduly limited to the illustrative embodiments set forth herein.

WHAT IS CLAIMED IS:

1. A fiber optic enclosure assembly for enclosing optical fiber connections comprising:
 - a housing having an interior region;
 - a bearing mount disposed in the interior region of the housing;
 - a cable spool connectedly engaged with the bearing mount such that the cable spool selectively rotates within the housing; and
 - a termination module mounted to the cable spool so that the termination module unitarily rotates with the cable spool.

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

3. A fiber optic enclosure assembly as claimed in claim 1, wherein the termination module includes an adapter plate having an adapter slot with a plurality of adapters engaged with the adapter slot.

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

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

6. A fiber optic enclosure assembly as claimed in claim 1, wherein an axial end of the cable spool defines a slack storage area.

7. A fiber optic enclosure assembly as claimed in claim 6, wherein the slack storage area includes a cable management spool.

8. A method of paying out a subscriber cable from a fiber optic enclosure, comprising rotating a cable spool, which includes a subscriber cable coiled around a spooling portion of the cable spool, about an axis of a housing of the fiber optic enclosure until a desired length of subscriber cable is paid out, wherein a termination module is mounted to the cable spool.
9. A method of paying out a subscriber cable from a fiber optic enclosure as claimed in claim 8, wherein the termination module is mounted to an axial end of the cable spool.
10. A method of paying out a subscriber cable from a fiber optic enclosure as claimed in claim 8, wherein the termination module includes a plurality of adapters.
11. A method of paying out a subscriber cable from a fiber optic enclosure as claimed in claim 10, wherein the termination module includes an adapter plate having an adapter slot with the plurality of adapters engaged with the adapter slot.
12. A method of paying out a subscriber cable from a fiber optic enclosure as claimed in claim 10, where the termination module includes a plurality of sliding adapter modules.
13. A method of paying out a subscriber cable from a fiber optic enclosure as claimed in claim 8, wherein connectorized ends of a first end of the subscriber cable are connected to adapters disposed in the termination module.
14. A method of paying out a subscriber cable from a fiber optic enclosure as claimed in claim 8, wherein the housing is mounted to a wall.

15. A method of paying out a subscriber cable from a fiber optic enclosure as claimed in claim 8, wherein the fiber optic enclosure is packaged in a shipping container during pay out of the subscriber cable.

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

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

Abstract

A fiber optic enclosure assembly includes a housing having an interior region and a bearing mount disposed in the interior region of the housing. A cable spool is connectedly engaged with the bearing mount such that the cable spool selectively
5 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.
10 A termination module is mounted to the cable spool.

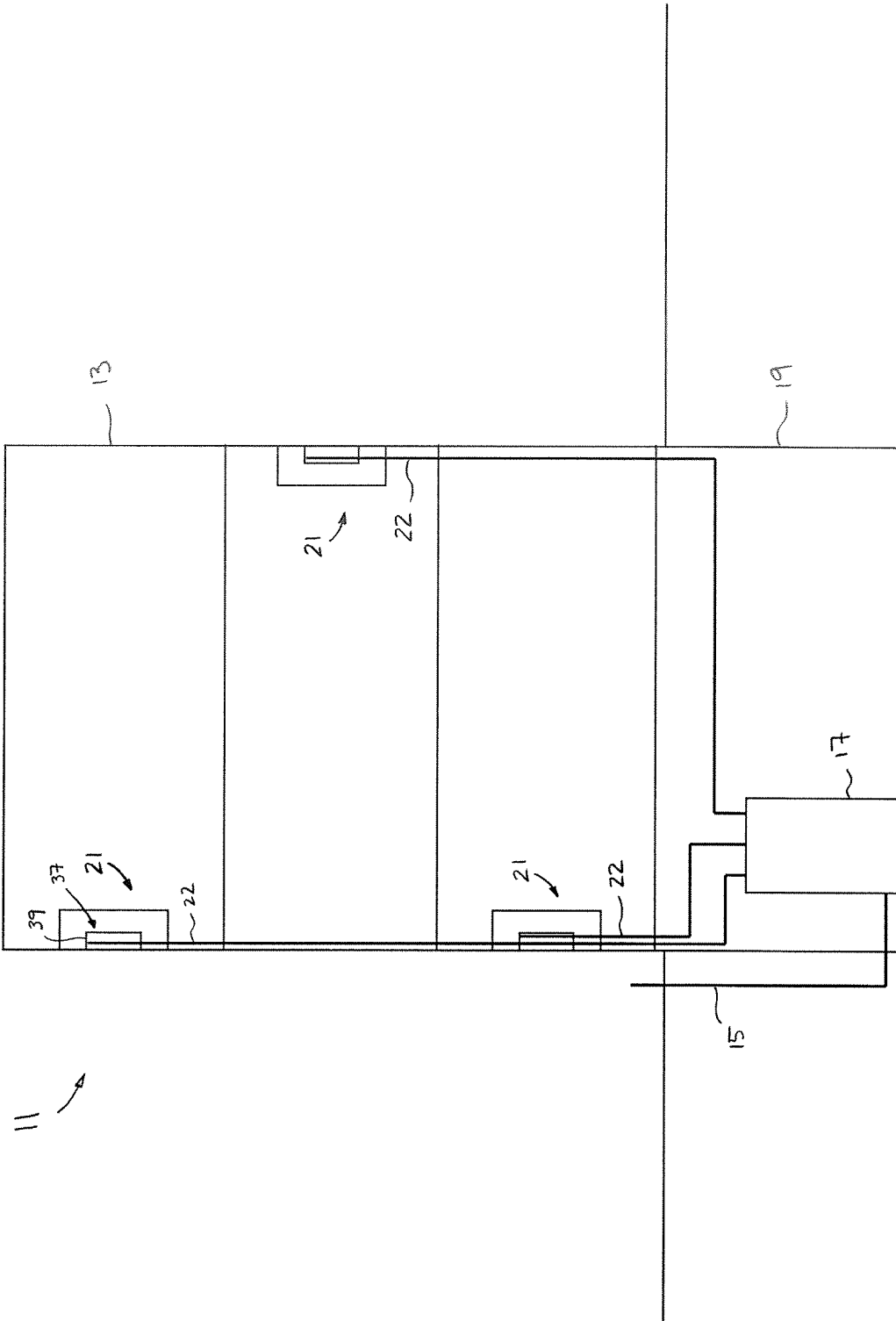


FIG. 1

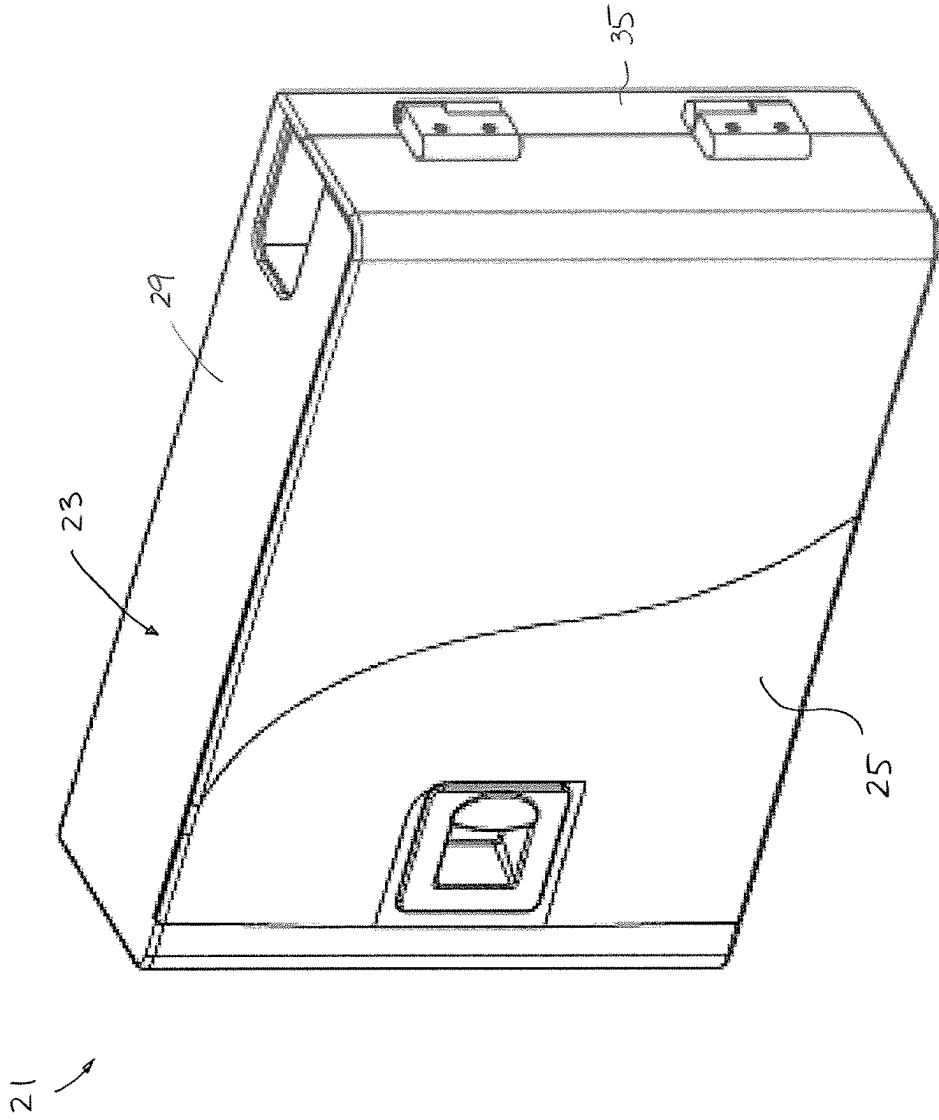


FIG. 2

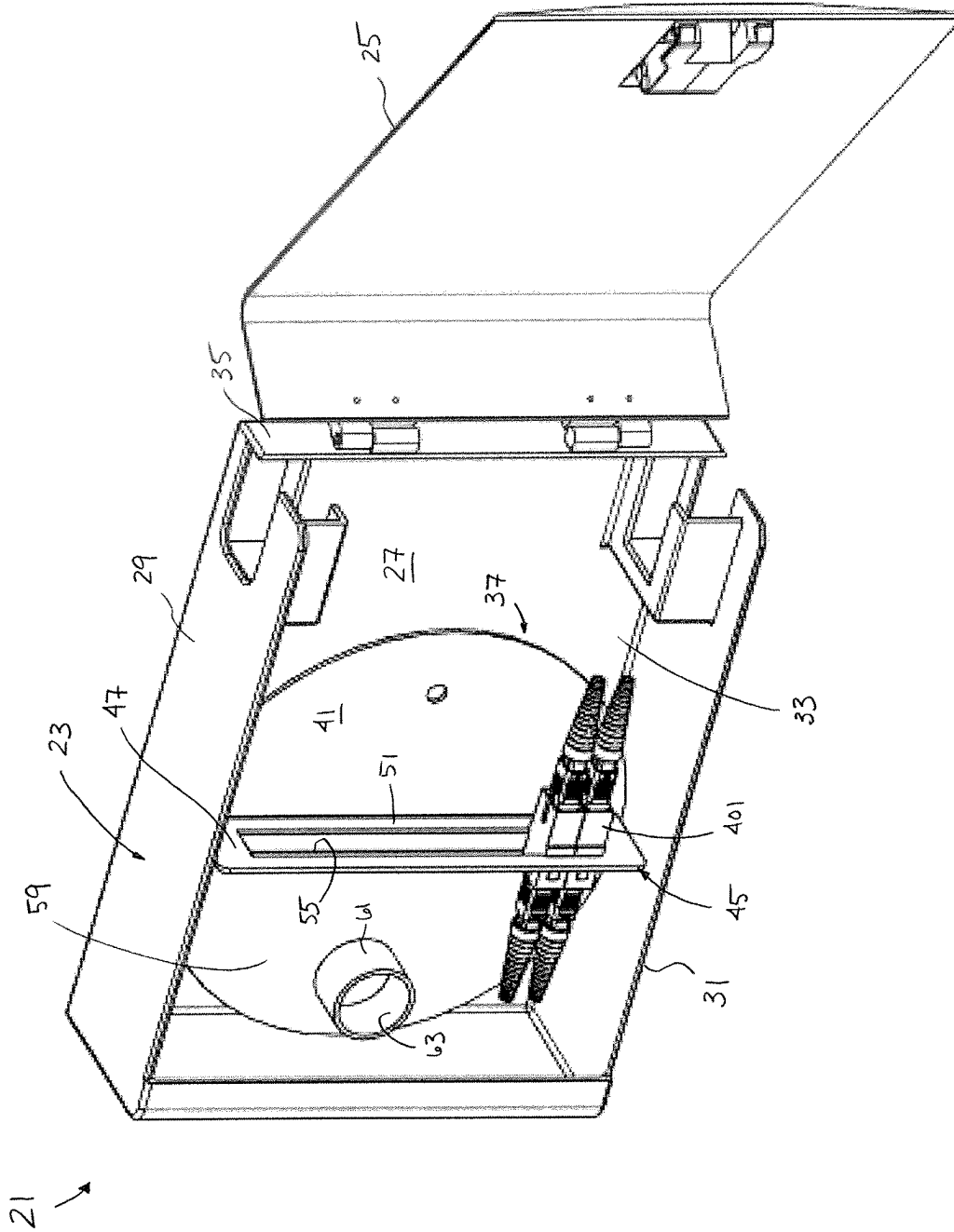


FIG. 3

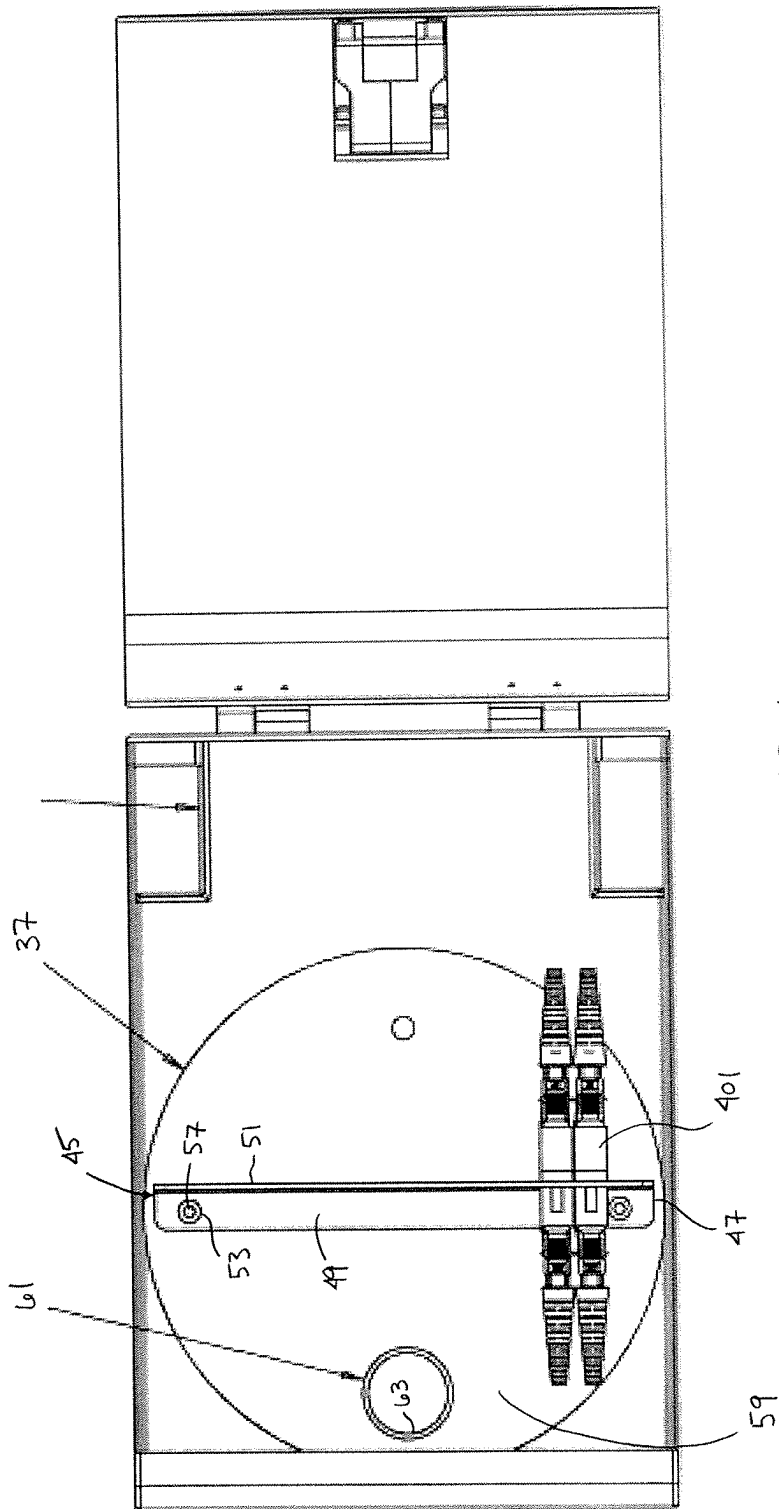


FIG. 4

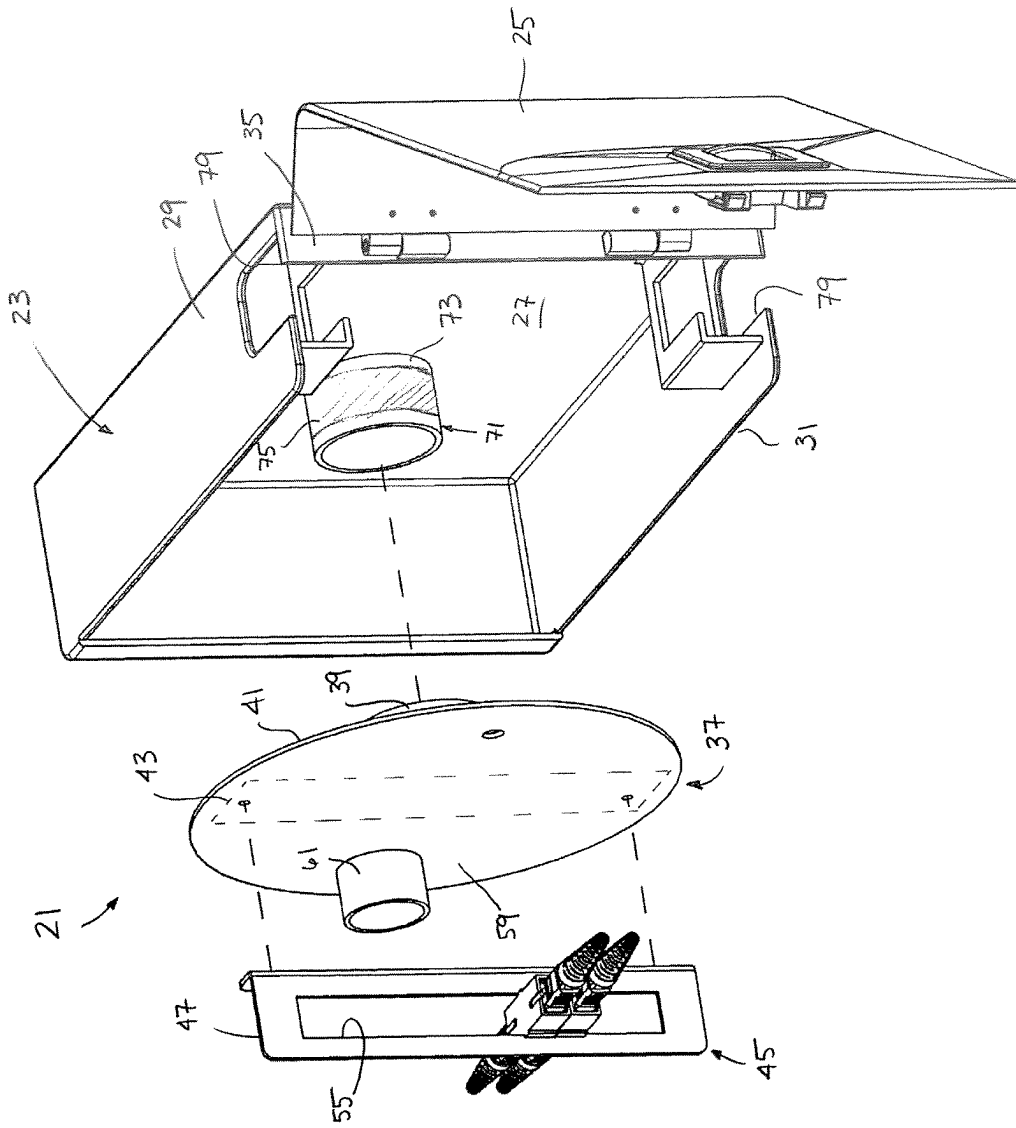


FIG. 5

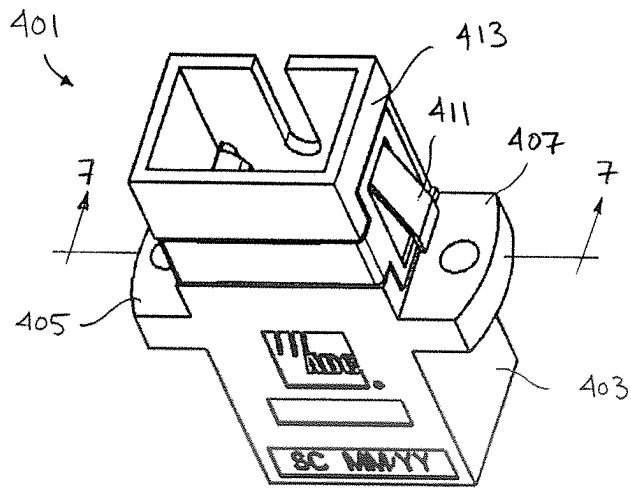


FIG. 6

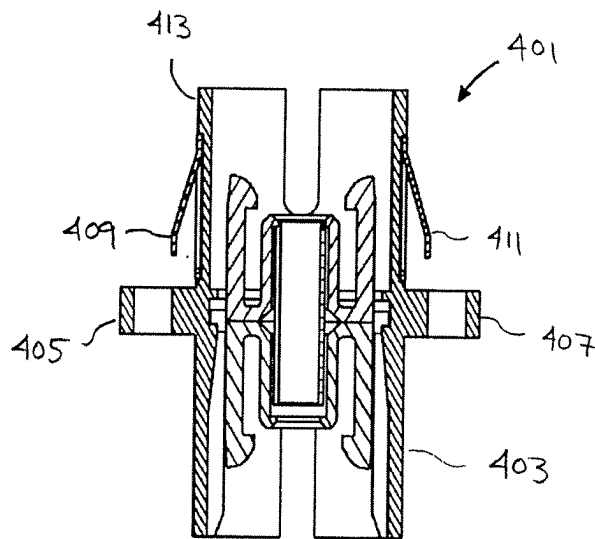


FIG. 7

Electronic Patent Application Fee Transmittal

Application Number:				
Filing Date:				
Title of Invention:	FIBER OPTIC ENCLOSURE WITH INTERNAL CABLE SPOOL			
First Named Inventor/Applicant Name:	Scott C. Kowalczyk			
Filer:	Jarett Dykes Millar/Jessica Molitor			
Attorney Docket Number:	02316.2584USP3			
Filed as Large Entity				
Provisional Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Provisional application filing	1005	1	200	200
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				IPR2025-01119

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				200

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
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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
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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.

IPR2025-01119