

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BELDEN INC. AND PPC BROADBAND, INC., AND OPTERNA AM, INC.,
Petitioners,

v.

COMMSCOPE TECHNOLOGIES LLC,
Patent Owner.

Case IPR2025-01119
U.S. Patent No. 10,996,417

**PETITION FOR INTER PARTES REVIEW
OF U.S. PATENT NO. 10,996,417**

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EXHIBIT LIST

EXHIBIT	DESCRIPTION
EX1001	U.S. Patent No. 10,996,417 (“’417 Patent”)
EX1002	U.S. Patent No. 5,109,467 (“ <i>Hogan</i> ”)
EX1003	U.S. Patent No. 6,220,413 (“ <i>Walters</i> ”)
EX1004	U.S. Patent No. 5,987,203 (“ <i>Abel</i> ”)
EX1005	File History of the ’417 Patent (U.S. Application No. 15/875,564) (“’564 Application”)
EX1006	U.S. Patent Application No. 12/192,705 (“’705 Application”)
EX1007	U.S. Provisional Patent Application No. 60/954,214 (“First Provisional”)
EX1008	U.S. Provisional Patent Application No. 61/029,248 (“Second Provisional”)
EX1009	European Patent No. EP2176696 B1 (“EP ’696 Patent”)
EX1010	European Patent Application No. 08837186.9 (“EP ’186 Application”)
EX1011	U.S. Patent No. 6,933,441 (“ <i>Fuller</i> ”)
EX1012	U.S. Patent No. 4,595,255 (“ <i>Bhatt</i> ”)
EX1013	U.S. Patent No. 6,201,920 (“ <i>Noble</i> ”)
EX1014	U.S. Patent No. 6,591,053 (“ <i>Fritz</i> ”)
EX1015	U.S. Patent Application Publication No. US2006/0210230 A1 (“ <i>Kline</i> ”)
EX1016	U.S. Patent No. 7,315,681 (“ <i>Kewitsch</i> ”)
EX1017	U.S. Patent No. 7,400,814 (“ <i>Hendrickson</i> ”)

EXHIBIT	DESCRIPTION
EX1018	CommScope Technologies LLC v. Belden Inc. et al, C.A. No. 24-440-RGA (D. Del.) Joint Claim Construction Chart for the '417 Patent
EX1019	Claims Listing Appendix
EX1020	<i>Curriculum Vitae</i> of Dr. Charles A. Eldering
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I. PRELIMINARY STATEMENT

Belden Inc., PPC Broadband, Inc., and Opterna AM, Inc. (“Petitioners”) respectfully request *inter partes* review (“IPR”) of claims 1-7, 9-12, and 21-38 (the “Challenged Claims”) of U.S. Patent No. 10,996,417 (“the ’417 patent”).

The ’417 Patent—filed over ten years after its priority claim as the ninth continuation in the family—claims drastically different subject matter than originally claimed. Patent Owner even conceded in a related application that the alleged inventive features disclosed in the specification and originally claimed (*e.g.*, a rotating spool with adapters mounted to and rotating with the spool for storing and paying out fiber optic cable) were part of the prior art and resorted to claiming conventional features of an enclosure for housing those elements (*e.g.*, a pivoting cover, sidewalls and a base, openings for the cables in the sidewalls, etc.). In the end, all that remains in the Challenged Claims are combinations of these conventional enclosure elements that are expressly disclosed by a primary prior art reference never considered by the Examiner with other claim elements that Patent Owner has already admitted are disclosed by the prior art. As demonstrated in the grounds below, this IPR should be instituted and the Challenged Claims canceled because nothing in the claims recites anything nonobvious.

II. RELIEF REQUESTED AND GROUNDS

The application that eventually issued as the ’417 Patent (U.S. Application

No. 15/875,564 (“’564 Application”)) (EX1005) was filed on January 19, 2018, claiming priority to (i) two provisional patent applications (*i.e.*, Application No. 60/954,214 (“First Provisional”) (EX1007) filed August 6, 2007, and application No. 61/029,248 (“Second Provisional”) (EX1008) filed February 15, 2008), and (ii) the first non-provisional application in the family (Application No. 12/192,705 (“’705 Application”)) (EX1006) that was filed on July 30, 2008. *See* EX1001, Cover.

The following prior art references relied upon for the Grounds asserted in this IPR all issued more than one year before the earliest possible priority date and therefore qualify as prior art under pre-AIA 35 U.S.C. § 102(b).

Exhibit	U.S. Patent Number
EX1002 (“ <i>Hogan</i> ”)	5,109,467, issued April 28, 1992
EX1003 (“ <i>Walters</i> ”)	6,220,413, issued April 24, 2001
EX1004 (“ <i>Abel</i> ”)	5,987,203, issued Nov. 16, 1999

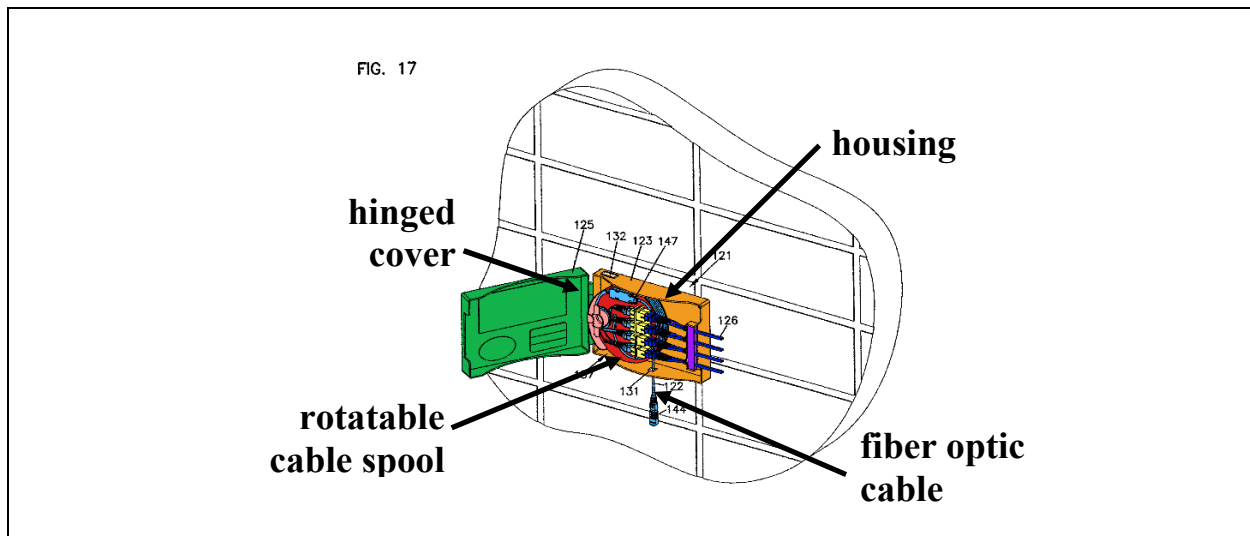
The Challenged Claim are unpatentable based on the following Grounds under 35 U.S.C. § 103:

Ground	Claims	Obviousness Combination
1	1-6, 22-25, 29-38	Obvious over <i>Hogan</i> and <i>Walters</i>
2	7, 9-12, 21, 26-28	Obvious over <i>Hogan</i> , <i>Walters</i> , and <i>Abel</i>

III. THE '417 PATENT

A. Overview of the '417 Patent

The '417 Patent discloses a wall mountable fiber optic enclosure with a housing (shown below in orange) and a hinged cover (green) enclosing a rotatable cable spool (red) for storing and paying out a fiber optic cable (light blue). EX1001, Title, Abstract, 1:32-34, 3:15-16, 6:38-39, FIGS. 1-5, 8-17.

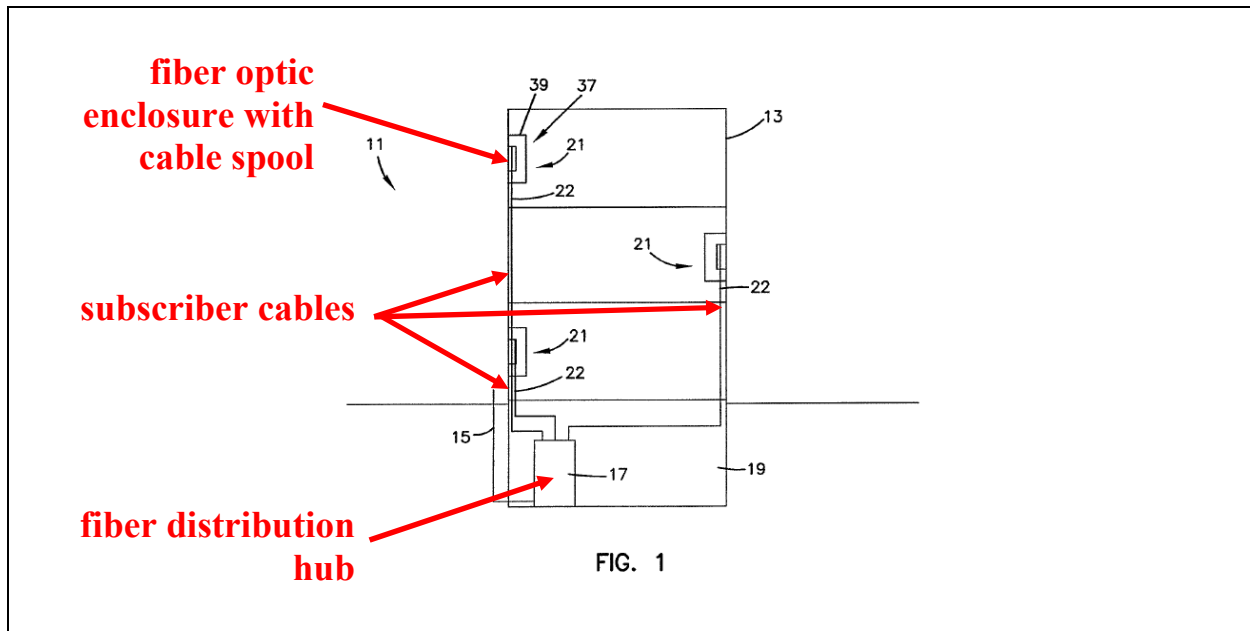


As explained in the Background, “[i]n facilities such as multiple dwelling units, apartments, condominiums, businesses, etc., fiber optic enclosures are used to provide a subscriber access point to the fiber optic network” and “are connected to the fiber optic network through subscriber cables connected to a network hub.” EX1001, 1:38-45, FIG. 1. Because “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,” “there is a need for a fiber

optic enclosure that can effectively manage varying lengths of subscriber cable.”

EX1001, 1:45-50; 5:1-6, FIG. 1.

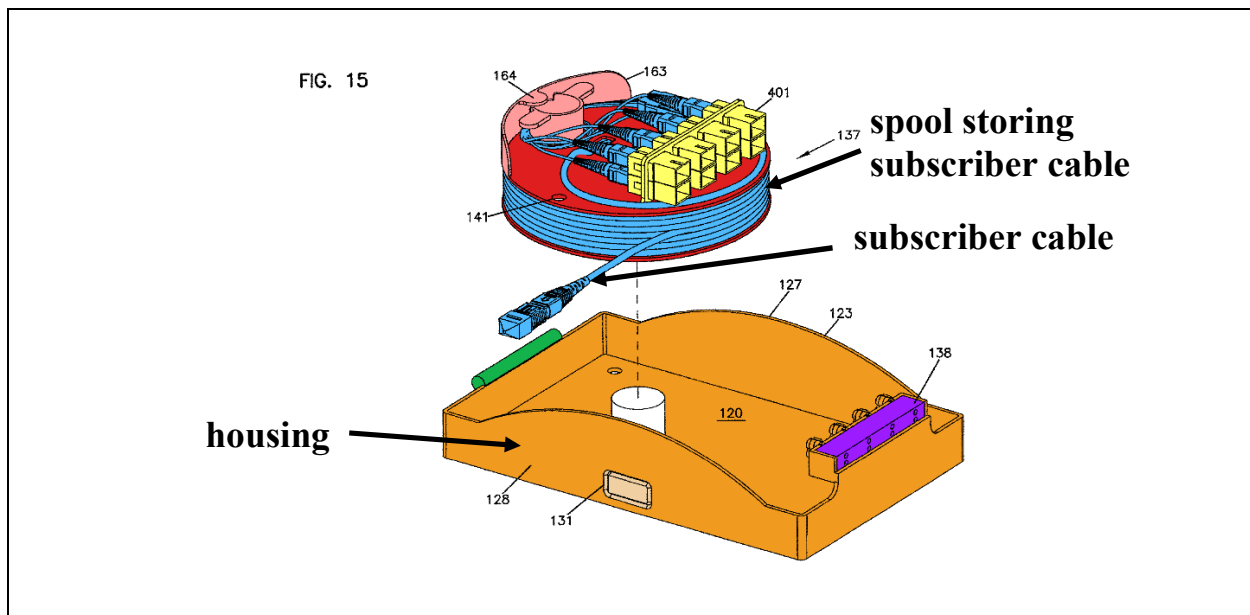
FIG. 1 of the '417 Patent shows a fiber optic network 11 in a facility 13, where a feeder cable 15 from a central office serves as an input to a fiber distribution hub 17 with an optical splitter (e.g., a 1-to-32 splitter) providing output subscriber cables 22 (typically including multiple fibers) from the fiber distribution hub 17 to each fiber optic enclosure 21. EX1001, 2:63-3:13, FIG. 1.



“[A]s 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.” EX1001, 5:1-6, FIG. 1. “[T]o account for the varying lengths of subscriber cable 22 needed between the fiber optic enclosure 21

and the fiber distribution hub 17 [t]he 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.” EX1001, 5:7-13, FIG. 1.

Regarding the first function (storage), “the subscriber cable 22 is stored in the fiber optic enclosure 21 by coiling the length of subscriber cable 22 around the cable spool 37.” EX1001, 5:14-16, 3:27-31, 6:53-62, FIGS. 3-5, 13-15, 17.

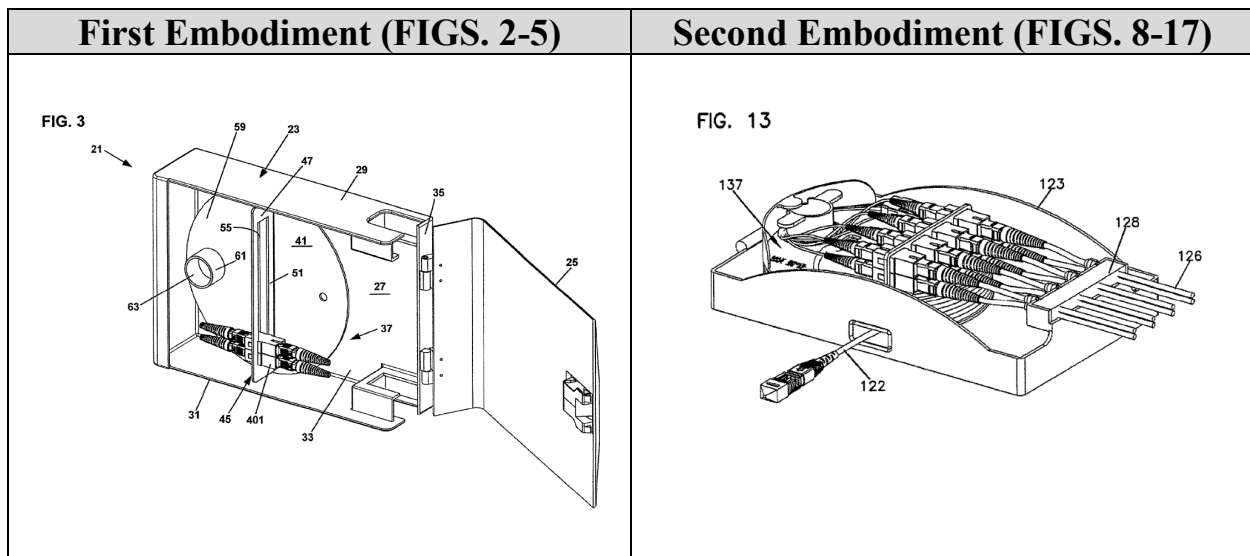


“In order to protect the subscriber cable 22 from attenuation resulting from the coiling of the subscriber cable 22 around the spooling portion 39, the cable spool 37 has an outer circumferential surface having a radius that is greater than the minimum bend radius of the subscriber cable 22.” EX1001, 4:56-63, FIG. 5.

Regarding the second function (paying out), the subscriber cable 22 stored on

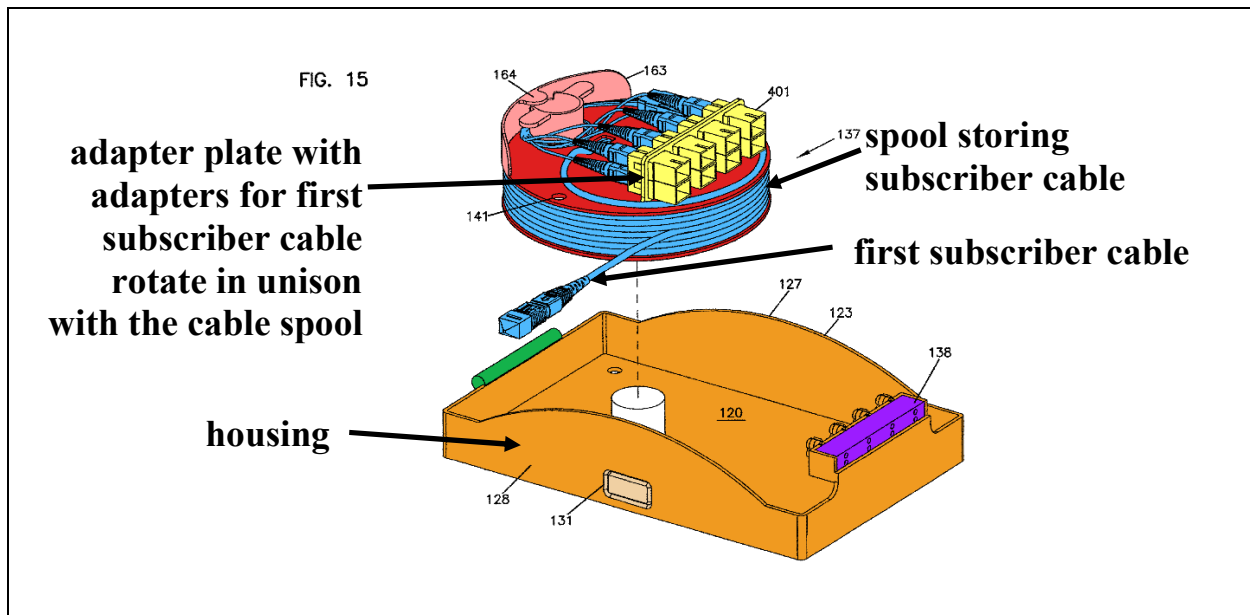
the cable spool 37 “is paid out of the fiber optic enclosure 21 by selectively rotating the cable spool 37 with respect to the housing 23” EX1001, 5:45-56, 6:63-67, FIGS. 1-5, 13-15, 17. If the distance between the fiber distribution hub 17 (*e.g.* 150 feet) is less than the length of the subscriber cable 22 (*e.g.*, 250 feet) coiled around the cable spool 37, then the excess cable length (*i.e.*, 100 feet) after the subscriber cable 22 is paid off will be stored on the cable spool as shown above in FIG. 13. EX1001, 5:39-44, FIGS. 1, 13, 15, 17.

The '417 Patent discloses two different embodiments of the fiber optic enclosure 21, 121. EX1001, 3:14-15, 6:37-38, FIGS. 2-5, 8-17.



Regarding the second embodiment shown in FIGS. 8-17, an “adapter plate 149 is disposed on the first axial end 136 of the cable spool 137” and “includes separate openings 151 ... adapted to receive two adapters 401.” EX1001, 7:33-37, 13-16; *see also id.*, 3:33-61, FIGS. 3-5.

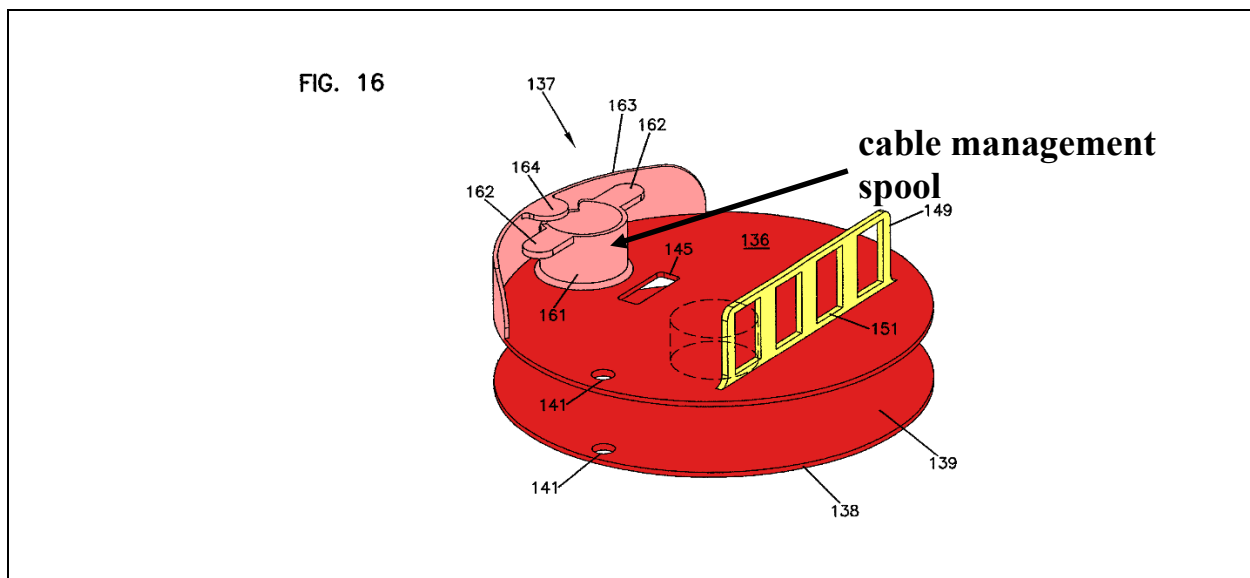
FIG. 15 below shows the configuration of the spool 137 (shown in red) and the adapter plate 149 (yellow) and adapters 401 (yellow) prior to and while the subscriber cable 122 (light blue) is paid out with the connectors 146 on the first end of the first subscriber cable 122 inserted into the adapters 401 on the front side of the adapter plate 149. EX1001, 3:63-66, FIGS. 3-5, 13-15, 17.



Since the adapter plate 149 is disposed on the cable spool 137, the rotation of the cable spool 137 in turn rotates the adapter plate 149, which rotates in unison with the cable spool 137, allowing the second end of the first subscriber cable 122 to be paid out without the connectors 146 on the first end of the first subscriber cable 122 being disturbed. EX1001, Abstract, 5:56-64, FIGS. 1-5, 13-15, 17.

As shown in FIG. 14 below, “[a]fter the subscriber cable 122 is paid out and cable spool 137 fixed in position relative to the housing 123, individual

124” from the first subscriber cable 122 after they are broken out into individual fibers having connectorized ends 146 using a fanout 147. EX1001, 7:6-16, FIGS. 13-17; *see also id.*, 4:17-20, FIGS. 3-5. The cable management spool (light red) is sized such that its outer radius is larger than the minimum bend radius of the optical fibers to avoid signal attenuation and damage to the optical fibers during storage. EX1001, 4:20-24, FIGS. 3-5, 13-17.



B. U.S. Prosecution History

The application that eventually issued as the '417 Patent (the '564 Application (EX1005)) was filed on January 19, 2018, as the ninth continuation in a patent family, more than ten years after its priority date. *See* EX1001, Cover.

On May 9, 2009, the Examiner issued a first office action Notice of Allowance (“First NOA”) of all twenty claims. EX1005, 226-233, 353-355 (original claims). In the Reasons for Allowance, the Examiner simply recited verbatim the text of allowed

independent claim 1. EX1005, 231-232.

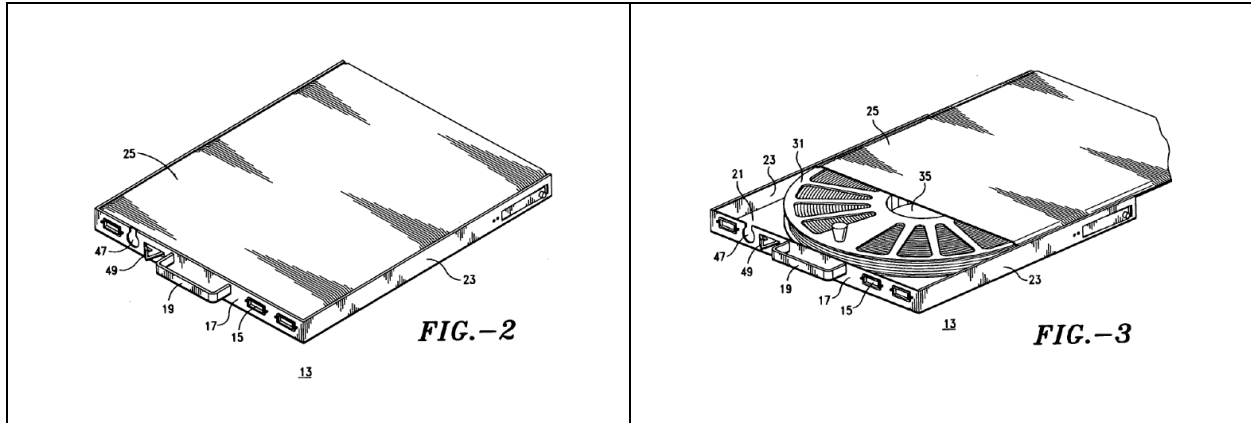
The Applicant then filed a Request for Continued Examination (“RCE”) to consider an Information Disclosure Statement (“IDS”) filed after the First NOA. EX1005, 186-194.

On November 26, 2019, the Examiner issued a non-final office action, rejecting claims 1-12 as obvious, but allowing claims 13-20.¹ EX1005, 159-171.

The first obviousness rejection was based on the combination of *Walters* and U.S. Patent No. 6,933,441 B2 (“*Fuller*”) (EX1011). The Examiner found that *Walters* discloses all the elements of original claim 1 (EX1005, 352) except the claim element requiring that “the cover is movable in order to selectively cover and uncover the opening in the housing.” (EX1005, 167-169).

To account for this allegedly missing claim element, the Examiner argued that *Fuller*’s teachings of a fiber optic cable storage enclosure for housing a cable storage reel with a sliding cover would be obvious to use in *Walters* for various reasons. EX1005, 169-170.

¹ The ’417 Patent’s issued claims have the same numbering as the pending claims during prosecution. EX1005, 24 (Index of Claims).



Fuller FIGS. 2-3.

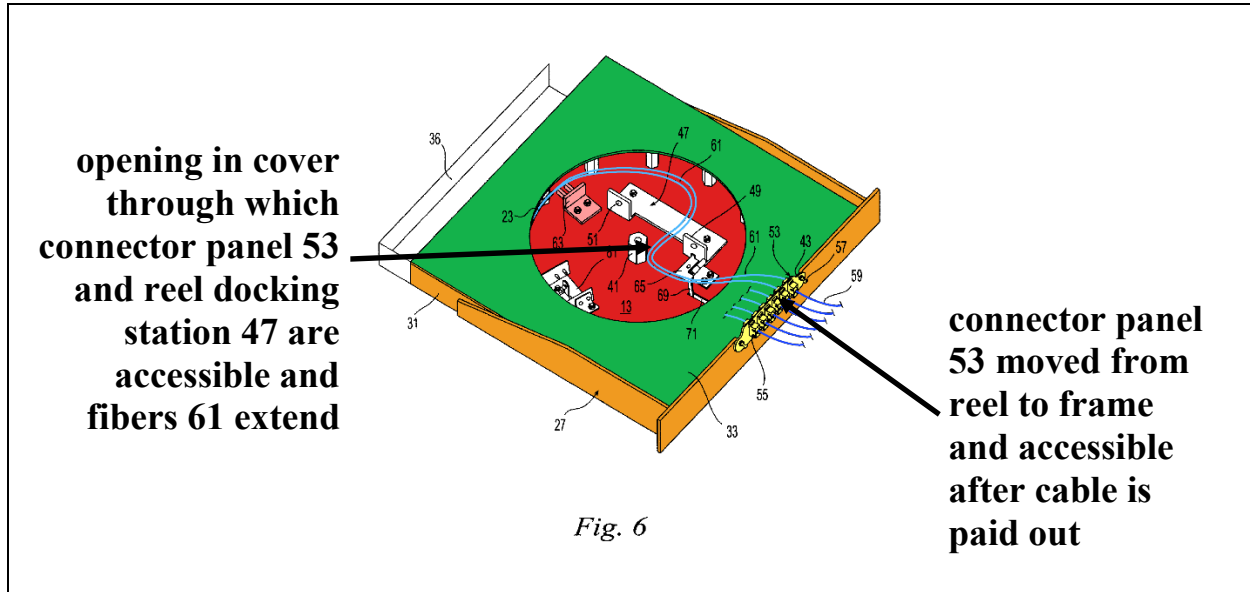
In response, the Applicant made minor amendments to the original claims and added new claims 22-33. EX1005, 136-142. Trying to distinguish the combination of *Walters* and *Fuller* from the amended claims, the Applicant argued that the proposed combination

does not disclose or suggest that access for plugging a connectorized end of the first cable into the second connector port of the fiber optic adapter is: a) available from the front of the housing when the cover is in the open position; and b) not available from the front of the housing when the cover is in the closed position in combination with the other features recited in amended claim 1.

EX1005, 145. In other words, the Applicant argued that *Walters* did not have a cover that would cover the adapters when closed.

The Applicant pointed to the fact that “the cover of *Walters* defines a large opening through which the connector panel 53 and reel docking station 47 are accessible” and that “[w]hen the connector panel 53 is moved from the reel docking

station 47 to the frame docking station 43, the fibers 61 extend through the opening (see FIG. 6).” EX1005, 145 (citing *Walters* FIG. 6).



The Applicant further argued that “[e]ven if the opening [in *Walters*] were removed, the connector panel 53 would still be accessible from the front of the housing when the cover was closed when the connector panel 53 was disposed at the frame docking station 43.” EX1005, 145. The Applicant still further argued that “removing the opening from the cover of *Walters* would destroy the functionality of *Walters* because the fibers 61 could not reach the connector panel 53 at the frame docking station 43.” EX1005, 145-146.

Regarding new claims 21-33, the Applicant continued to focus on the claim elements directed to the enclosure to distinguish *Walters* and *Fuller* (*i.e.*, not the spooling or adapter/connector features). EX1005, 146 (“None of the cited references discloses or suggests a cable spool mounted to and rotatable relative to an enclosure

arrangement; and a cover being securable in a position in which the cover engages sidewalls of the enclosure arrangement and extends across a fiber optic adapter.”).

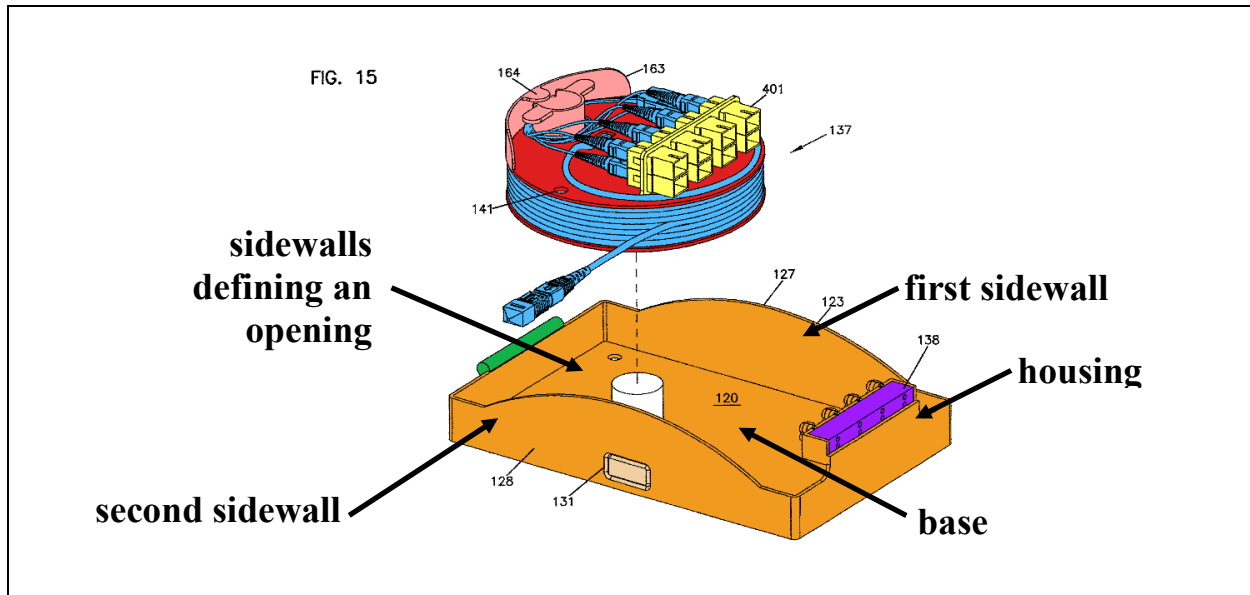
In a final office action, the Examiner maintained the same rejection of claims 1-12, but allowed new claims 21-33 (along with already allowed claims 13-20). EX1005, 108-123.

In response, the Applicant amended the first element of claim 1 with amendments directed to a “wall mountable” enclosure and its cover to try to distinguish the rack mounted enclosures disclosed by *Walters* and *Fuller*. EX1005, 91.

1. (Currently Amended) A fiber optic enclosure comprising:
a housing-wall mountable enclosure arrangement including a base, sidewalls that project forwardly from the base, and a cover-at a front of the housing, the sidewalls defining an access opening and defining a cable opening separate from the access opening, the cover being movable pivotal relative to the base about a pivot axis between an open position providing access to the access opening and a closed position covering the access opening, the cover contacting the sidewalls when disposed in the closed position;

The new claim limitations (wall mountable enclosure, base, sidewalls defining an opening, pivoting cover providing access to the opening and covering the opening by contacting the sidewalls) simply defined a conventional enclosure/box with a hinged cover. *Eldering*, ¶53.²

² References to “Eldering” are to the Declaration of Dr. Charles A. Eldering in

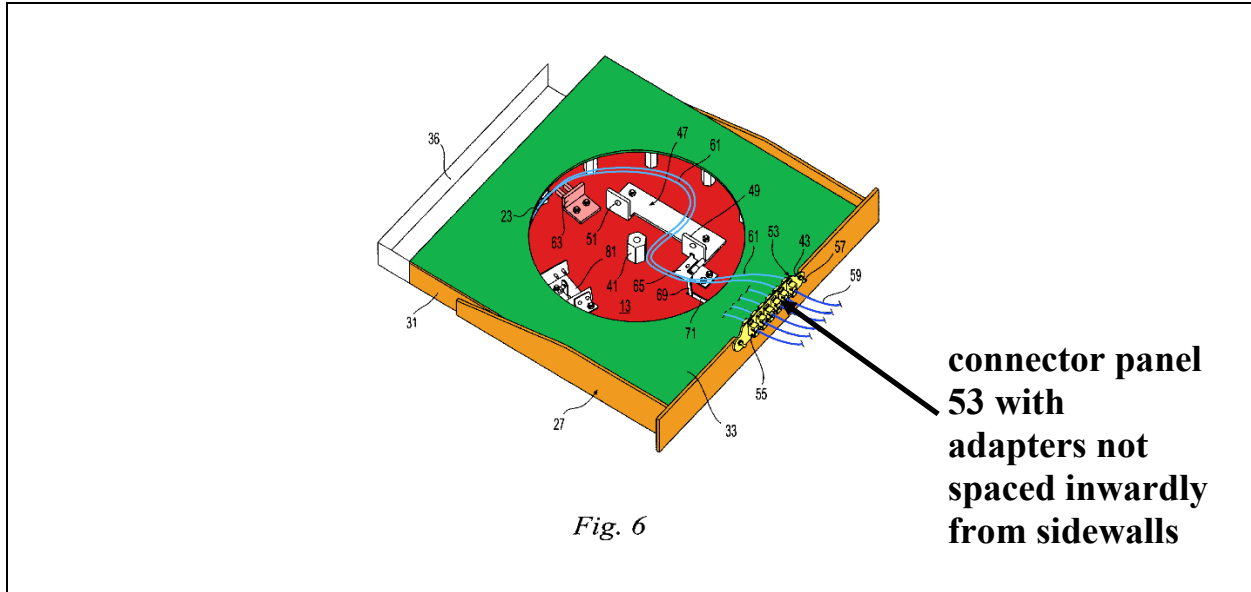


EX1001, FIG. 15.

The amendment of claim 1 also clarified that the fiber optic adapter was “spaced inwardly from the sidewalls of the housing” (*i.e.*, the adapter was in the box). EX1005, 91.

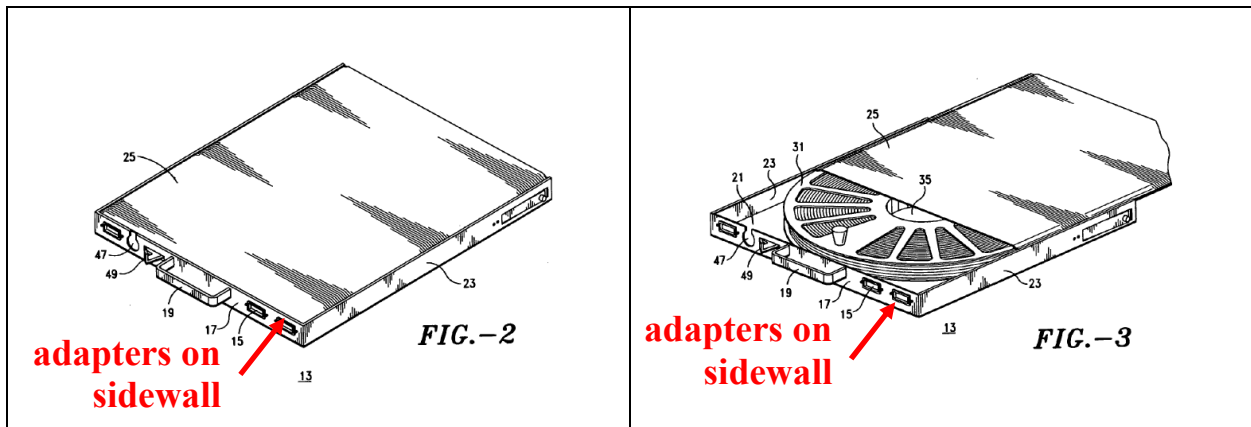
In the remarks, the Applicant distinguished the claimed invention’s “wall mountable enclosure arrangement” with the “rack-mounted housings” disclosed in *Walters* and *Fuller*. EX1005, 88. The Applicant also distinguished that the fiber optic adapter in *Walters* is not spaced inwardly from the sidewalls when the connectorized second cable is plugged into the adapter, but instead the adapter is mounted at the sidewall (EX1005, 89) as shown in FIG. 6 below.

Support of the Petition for IPR (EX1021).



Walters FIG. 6.

Regarding *Fuller*, the Applicant pointed out that the fiber optic adapters are mounted to the sidewalls rather than “inwardly” from the sidewalls. EX1005, 89.

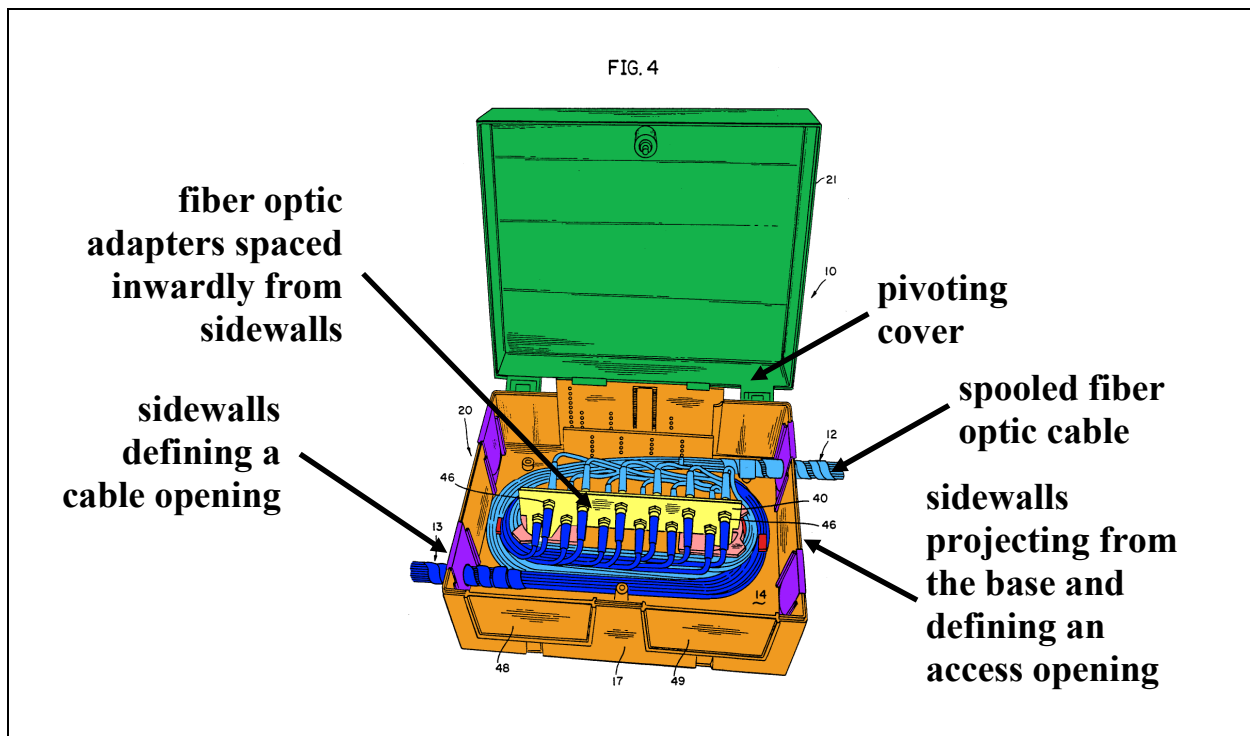


Fuller FIGS. 2-3.

The Examiner then issued a second Notice of Allowance on February 4, 2021, with Reasons for Allowance that simply recited verbatim all the elements of the independent claims. EX1005, 51-61.

The '417 Patent eventually issued on May 4, 2021. '417 Patent Cover.

As will be explained, the conventional enclosure claim elements that the Examiner concluded were not present in *Walters* and *Fuller* are expressly taught by the wall mountable cabinet enclosing a spool for storing a fiber optic cable disclosed in *Hogan* (shown below), the primary reference in this proceeding that was never considered by the Examiner during prosecution of the entire patent family. Elderling, ¶61.



Hogan FIG. 4.

C. European Patent Office File History

The Applicant filed a related patent application in the European Patent Office (“EPO”) with similar claim elements to the '417 Patent. During prosecution, that

Applicant tried to overcome *Walters* by introducing claim elements directed to the enclosure while expressly admitting that *Walters* alone disclosed almost every other feature in the claims that mirrored the original claims filed in the U.S. patent family.

European Patent No. EP2176696 B1 (“EP ’696 Patent”) (EX1009) published on April 23, 2014, several years before the ’417 Patent was filed in January 2018. The EP ’696 Patent issued from European Patent Application No. 08837186.9 (“EP ’186 Application”) (EX1010).

Prior to examination, in April 2010, the Applicant filed a voluntary amendment (EX1010, 211-217) to the original claims (EX1010, 26-28) that were filed in the corresponding PCT Application (EX1010, 36-68). Independent claim 1 of the European application (EX1010, 212) included all the claim elements of original independent claim of the ’705 Application (EX1006, 301), the initial non-provisional application filed in the U.S. patent family filed on July 30, 2008.

In April 2011, the EPO Examiner rejected pending claim 1 for lacking novelty based on *Walters* (identified as cited document D1) and the remaining pending claims for lacking an inventive step based on *Walters* alone, *Walters* in combination with other references, or routine skill. EX1010, 218-222. In doing so, the Examiner determined that *Walters* discloses a housing, a cable spool rotating within the housing, a termination module (adapter plate) disposed on and rotating in unison with the cable spool, a cable manager disposed on the cable spool, and fiber optic

cable wrapped around the cable spool with connectorized ends routed to the termination module. EX1010, 220-221, ¶2.2.

The Examiner also issued a formal objection to the claims that were not written “in the two-part form in accordance with Rule 43(1) EPC,” which requires a preamble that includes all the features of the claim that in combination are known in the closest prior art and a “characterizing part” that includes the other features that are allegedly not known in the closest prior art. EX1010, 222, ¶4.1.

In October 2011, the Applicant responded by amending the claims in two-part form with a preamble including virtually all the features of the initial claims and admitting that those features were taught by *Walters* (document D1). EX1010, 225-227, 232-238. For example, regarding the “fiber optic enclosure” of claim 1, the Applicant acknowledged that the newly drafted preamble (*i.e.*, the portion of the claim before “characterized in that”) “is based on D1” (*Walters*). EX1010, 226, ¶1.1.4.

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.

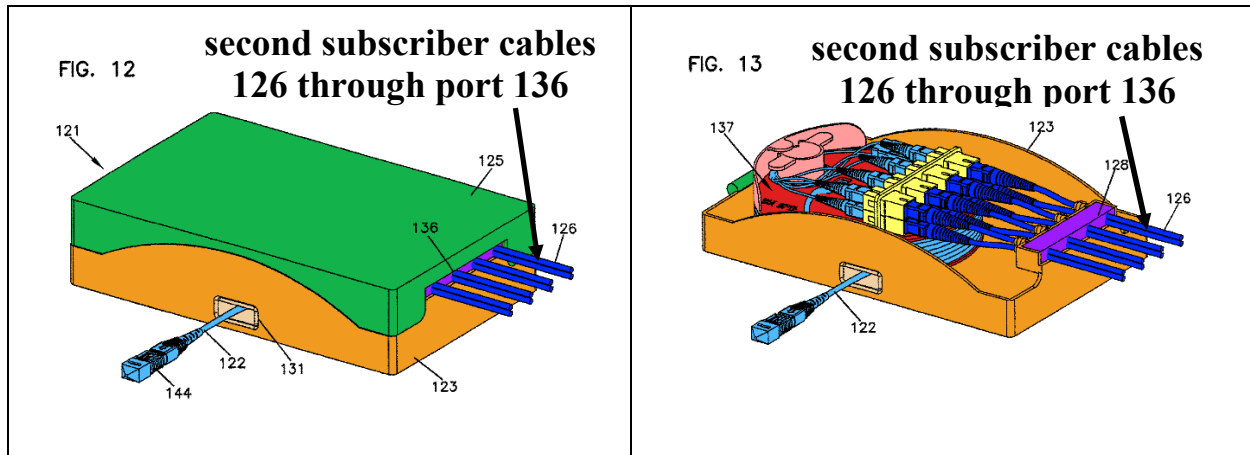
EX1010, 232 (highlighting preamble).

In doing so, the Applicant admitted that *Walters* teaches the combination of a housing, a cable spool rotating within the housing, a termination module (adapter plate) disposed on and rotating in unison with the cable spool, a cable manager disposed on the cable spool, and fiber optic cable wrapped around the cable spool

with connectorized ends routed to the termination module as the Examiner had already found. EX1010, 220-221, ¶2.2. And given the similarity between the European independent claim 1 (EX1010, 232) and the original independent claim 1 in the '705 Application (EX1006, 301), the Applicant essentially admitted that *Walters* teaches the invention that was originally pursued in the U.S. patent family. *Eldering*, ¶68.

In addition, the Applicant deleted the feature “a cable manager disposed on an axial end of the cable spool” from pending claim 1, admitting that “[t]his 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.” EX1010, 226, ¶1.1.2.

After admitting that all of the claimed features of the initial independent claim 1 (both in Europe and the U.S.) were either known or irrelevant to the solution of the technical problem, the Applicant introduced by amendment a completely new claim element directed to the housing: “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” as shown in FIGS. 12 and 13 of the published application. EX1010, 145, 226, ¶1.1.3.



The Applicant argued that the amended claims were novel and inventive over *Walters*, which allegedly does not disclose this port in the housing through which the second cable accesses the interior region of the housing to connect to the termination module. EX1010, 227-229, ¶¶2.1-3.10.

On July 23, 2012, the Examiner issued a second office action maintaining the rejections of the claims. EX1005, 239-243.

The Applicant responded in November 2012, also maintaining the same arguments based on the claimed port in the housing through which the second cable accesses the interior region of the housing to connect to the termination module . EX1005, 244-248.

In July 2013, the Examiner issued a summons to attend oral proceedings. EX1010, 259-266. The Applicant then provided its written submission for the oral proceedings. EX1010, 289-327. The Applicant once again focused on the claim requirement that the second cables are connected to the termination module adapters

while the connectors are inside the housing. EX1010, 291-292, ¶¶5-8.

In case this argument was not successful, the Applicant provided a first auxiliary request and claims that amended the claims to add a slotted foam member in the port for sealing the second cables. EX1010, 295-296, 304-307, 316-319. The Applicant also provided a second auxiliary request and claims that amended the claims to require that the housing cover be hinged to allow access to the interior and seal the interior from the environment. EX1010, 297, 308-311, 324-327.

Eventually, the Examining Division concluded that the proposed claims directed to the fiber optic enclosure, including the auxiliary requests, were neither novel nor inventive over *Walters*. EX1010, 359, ¶1.

Accordingly, the EPO correctly determined that *Walters* was not overcome by claim amendments directed to simple and known features of an enclosure (openings, pivoting covers, locating adapters in the enclosure, etc.).

IV. LEVEL OF ORDINARY SKILL.

A person of ordinary skill at the time of the invention of the '417 Patent (2017) (“POSITA”) would have at least at least a bachelor’s degree in physics or engineering, or a related field, and at least two years of experience related to fiber optic networks. Higher levels of education may offset less experience, and extensive experience can substitute for formal education. *Eldering*, ¶¶17-20.

V. CLAIM CONSTRUCTION

No terms need to be construed under 37 C.F.R. § 42.100(b) to resolve unpatentability. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those [claim] terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”).

In the pending litigation involving the '417 Patent, Petitioners and Patent Owner have proposed different claim constructions for the claimed fiber optic adapter spaced inwardly from the sidewalls for receiving the fiber optic connector wherein the connector rotates in concert/unison with the spool as the cable is paid out (*i.e.* Claim Elements 1[G], 1[H2], 22[D], 22[E] in Claims Appendix). EX1018.

Patent Owner contends in the litigation that the claims do not require that the adapter be mounted to the spool or plugged into the adapter when the spool rotates, while Petitioners contend that the claims are narrower in scope and do require such limitations. EX1018, 1, 4. Because the prior art combination of *Hogan* and *Walters* in Ground 1 teaches these limitations under either party's proposed construction, the Board need not construe the claim terms. *Eldering*, ¶79.

Similarly, whether (i) the “cable manager” recited in dependent claims 7 and 9-11, (ii) the “means for storing slack cable” recited in dependent claim 12, and (iii) the “cable management structure” recited in dependent claims 26-28, should be interpreted as means-plus-function elements under 35 U.S.C. § 112, ¶6 need not be

resolved by the Board.

To the extent that these terms do not connote sufficient definite structure to warrant treatment as means-plus-function elements, the recited functions of storing slack cable are achieved by cable spools 61, 161 in the '417 Patent. EX1001, 4:17-24, 7:14-32, FIGS. 3-5, 13-17. The prior art combination of *Hogan*, *Walters*, and *Abel* in Ground 2 also teaches a spool for performing the claimed function of storing slack cable in substantially the same way (having the fiber wound around the spool) to achieve substantially the same result (avoiding excessive bending and resulting signal attenuation or damage to the fiber) as the cable spools 61, 161 disclosed in the '417 Patent. Since the “cable manager,” “means for storing slack cable,” and “cable management structure” claim elements of dependent claims 7, 9-12, and 26-28 are disclosed whether or not they are means-plus-function elements, the Board need not construe the claim terms. *Eldering*, ¶80.

VI. GROUND 1 – HOGAN AND WALTERS RENDER OBVIOUS CLAIMS 1-6, 22-25, AND 29-38.

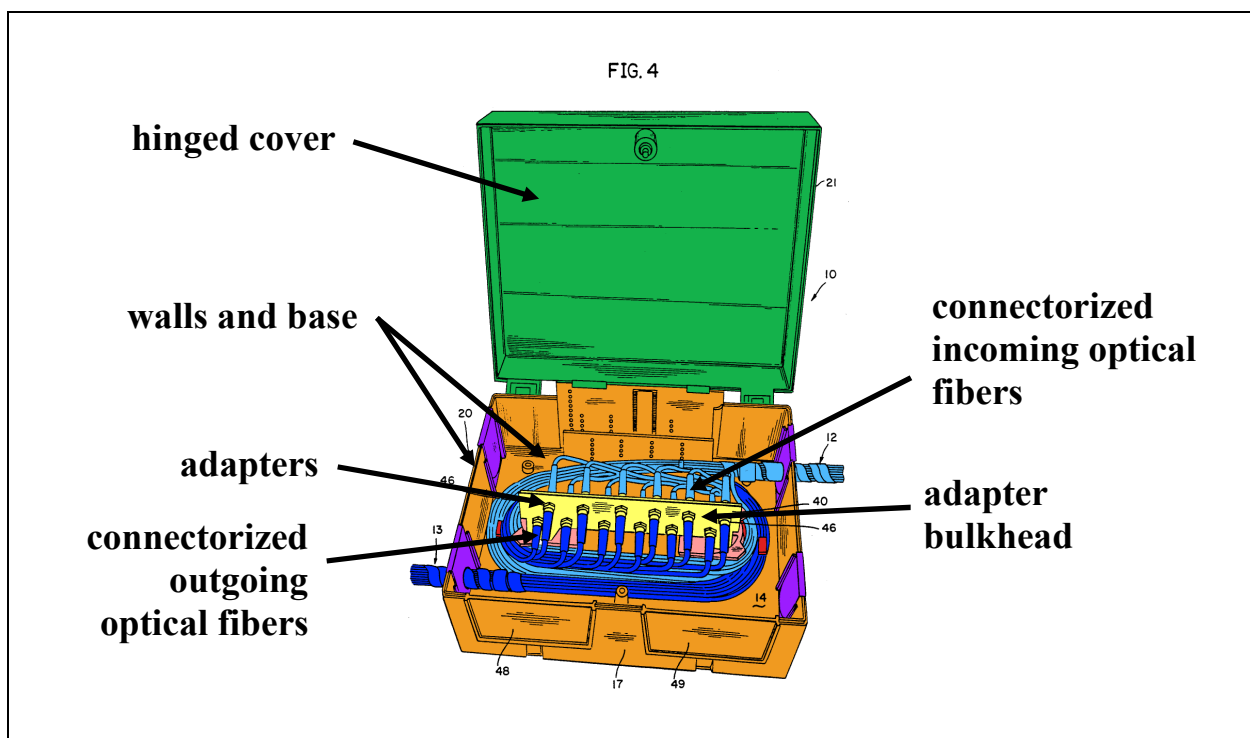
A. The Prior Art

1. Hogan (EX1002)

Hogan issued in April 1992, more than 15 years before the filing of the First Provisional (EX1007) that eventually led to the '417 Patent. *Hogan*, Cover.

Like the '417 Patent, *Hogan* discloses an optical fiber interconnect cabinet 10, including a hinged cover 21 (shown in green below), wall 20 (orange), base 14

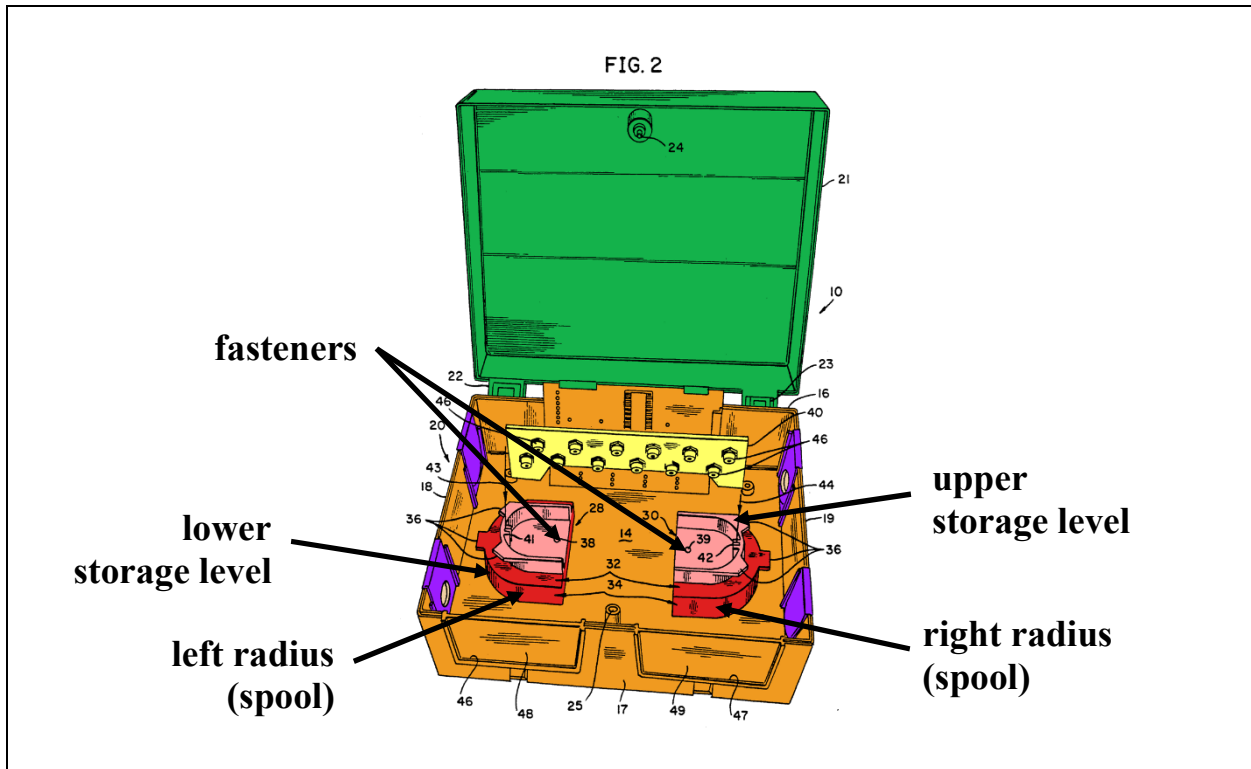
(orange), connectorized telephone company (incoming) optical fibers 12 (light blue), connectorized customer (outgoing) optical fibers 13 (blue), and adapters 45³ (yellow) mounted on an internal adapter plate (bulkhead 40 (yellow)) for interconnecting the incoming and outgoing connectorized optical fibers. *Hogan*, Title, Abstract, 1:6-10, 1:53-2:3, 2:28-44, 2:58-3:1, 3:28-35, 3:40-44, 4:3-14, FIGS. 1-4; Elderling, ¶84.



The excess lengths of incoming and outgoing optical fibers 12, 13 are wrapped and

³ *Hogan*'s specification uses element 45 to describe the adapters, but the figures label the adapters with element number 46. See, e.g., EX1002 2:36-44 (“adapters 45 provided on the internal bulkhead”), FIG. 3 (showing adapters as element 46).

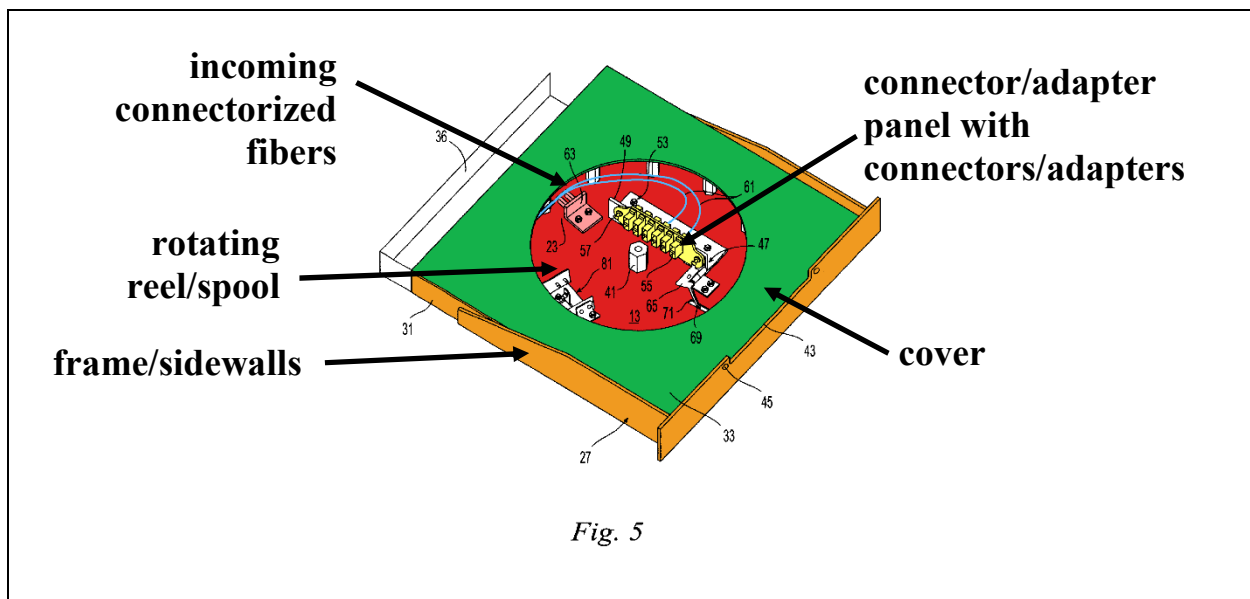
stored around radiuses (or spools) 28 and 30, which have an upper storage level 32 (light red) and a lower storage level (34) and are secured to the base 14 (orange) using threaded fasteners 38, 39. *Hogan*, Abstract, 1:61-2:3, 3:10-14, 3:14-27, 3:40-44, 4:3-9, FIGS. 2-4; Eldering, ¶85.



Hogan is analogous to the '417 Patent because both relate to an enclosure for interconnecting incoming and outgoing fiber optic cables and storing incoming fibers on a spool. *Hogan*, Title (“Interconnect Cabinet for Optical Fibers”), Abstract, 1:6-10, 1:53-2:3, 2:28-44, 3:28-35, 3:40-44, 4:3-14, FIGS. 1-4; '417 Patent Title (“Fiber Optic Enclosure with Internal Cable Spool and Moveable Cover”), Abstract; Section III.A (Overview of the '417 Patent); Eldering, ¶86.

2. *Walters (EX1003)*

Walters issued in April 2001, more than six years before the filing of the First Provisional (EX1007) that eventually led to the '417 Patent. *Walters*, Cover. Like the '417 Patent, *Walters* discloses a fiber optic cable storing apparatus, including a cover 33 (green), a frame 27 (orange) having a baseplate 29 (orange) and sidewalls 31 (orange), an incoming fiber optic cable 23 (light blue) with connectorized optical fibers 61 (light blue), connectors/adapters (yellow) mounted on a connector/adaptor panel 53 (yellow), and a reel/spool 11 (red) that rotates to pay out the fiber optic cable 23. *Walters*, Title, Abstract, 1:4-5, 1:22-25, 1:65-67, 2:5-30, 2:40-46, 2:52-3:24, 4:31-47, FIGS. 1-2, 5-6; Elderling, ¶88.



Because the incoming connectorized fibers 61 are connected to the connectors/adapters 55 on the connector/adaptor panel 53, when the reel/spool 11 rotates to pay out the cable 23, the connector panel 53 and the attached fiber

connectors will also rotate in concert/unison with the reel/spool 11. *Walters*, Abstract, 1:28-30 (“When mounted to the reel docking station with the line to the electrical equipment disconnected, the connector panel will rotate with the reel.”); FIG. 5; Eldering, ¶89.

Walters is analogous to the ’417 Patent because both relate to an enclosure for interconnecting incoming and outgoing fiber optic cables and storing incoming fibers on a rotating spool. *Walters*, Title (“Retractable Cable Reel”), Abstract (“A cable storage device has a reel rotatably mounted in a frame. The reel has a hub that rotates with the reel. A connector panel has a plurality of connectors for interconnecting with an end of the cable on the reel.”), 1:4-5, 1:22-25, 1:65-67, 2:5-30, 2:40-46, 2:52-3:24, 4:31-47, FIGS. 1-2, 5-6; ’417 Patent Title (“Fiber Optic Enclosure with Internal Cable Spool and Moveable Cover”), Abstract; Section III.A (Overview of the ’417 Patent); Eldering, ¶90.

B. Independent Claim 1⁴

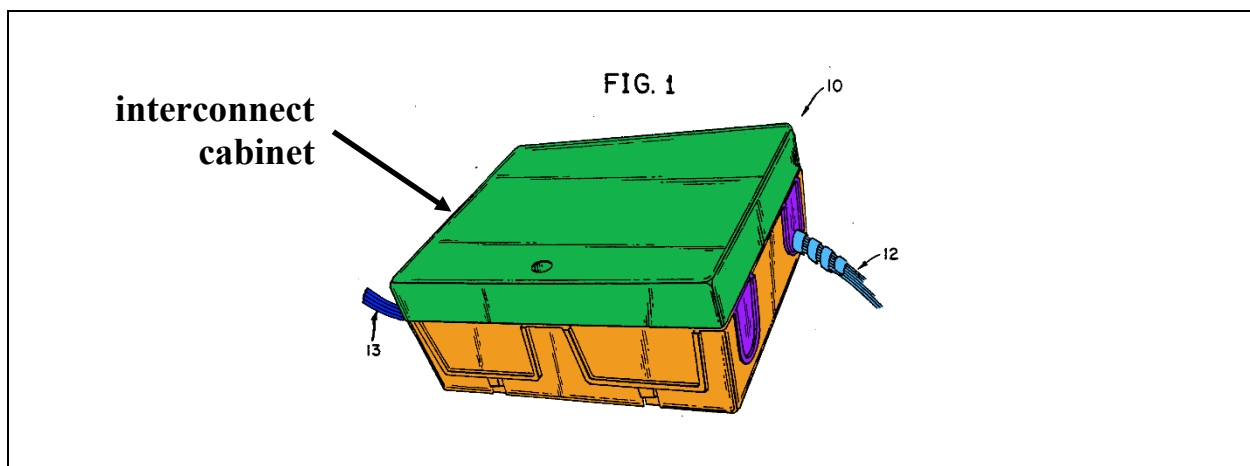
Hogan and *Walters* render obvious independent claim 1. Eldering, ¶¶91-157.

⁴ The Claims Appendix provided at the end of the Petition (and submitted as EX1019) includes the language and claim element designations for the Challenged Claims.

1. *1[Preamble]*

Hogan and *Walters* render obvious Element 1[Preamble]. The disclosure in *Hogan* of Element 1[Preamble] also renders obvious Element 22[Preamble]. Elderling, ¶¶91-92.

Hogan discloses a fiber optic enclosure⁵ (interconnect cabinet 10). *Hogan*, Title, Abstract, 1:6-10, 1:53-2:3, 2:28-35, FIGS. 1-4; Elderling, ¶92.



2. *Element 1[A]*

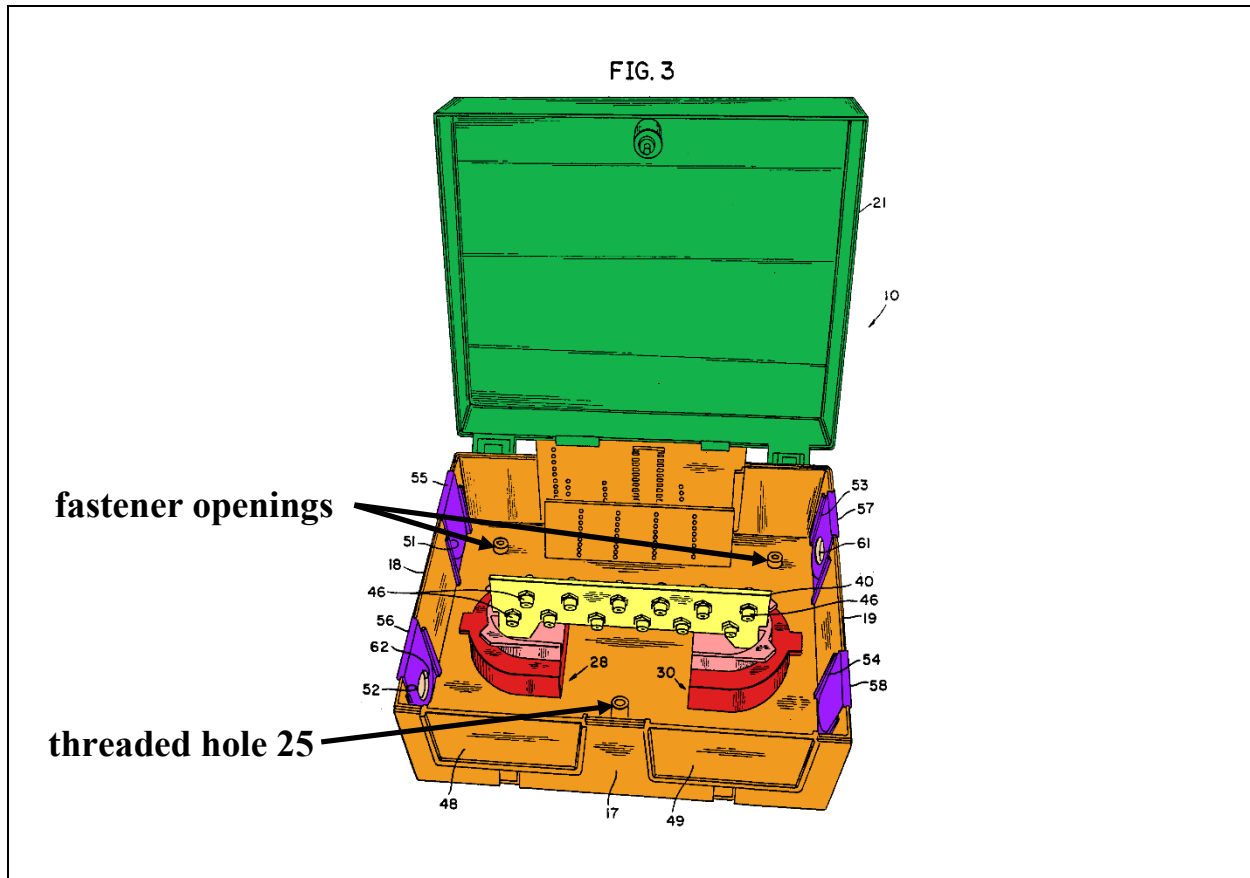
Hogan and *Walters* render obvious Element 1[A]. The disclosure in *Hogan* of Element 1[A] also renders obvious Element 22[A] (except for “the enclosure arrangement defining a cable opening” addressed in Element 1[B]) and dependent claims 2 and 29-31; Elderling, ¶¶93-99.

Hogan’s interconnect cabinet 10 is a wall mountable enclosure arrangement

⁵ Claim language is shown underlined.

that can be secured to an installation surface (wall) using fasteners extending through the plurality of fastener openings defined in the base 14 of the housing as shown below. *Hogan*, FIGS. 3-4. A POSITA would understand that *Hogan*'s interconnect cabinet was wall mountable using these fastener openings. This disclosure in *Hogan* also renders obvious dependent claim 31 ("wherein the base defines a plurality of rear fastener openings⁶ for use in securing the enclosure arrangement at an installation surface"). Elderling, ¶94.

⁶ While the fastener openings for mounting *Hogan*'s cabinet 10 do not have element numbers, they are depicted the same as the threaded hole 25 used for securing the rotatable, threaded fastener 24 of the cover. *Hogan*, 2:64-3:1, FIGS. 2-4; Elderling, ¶94.

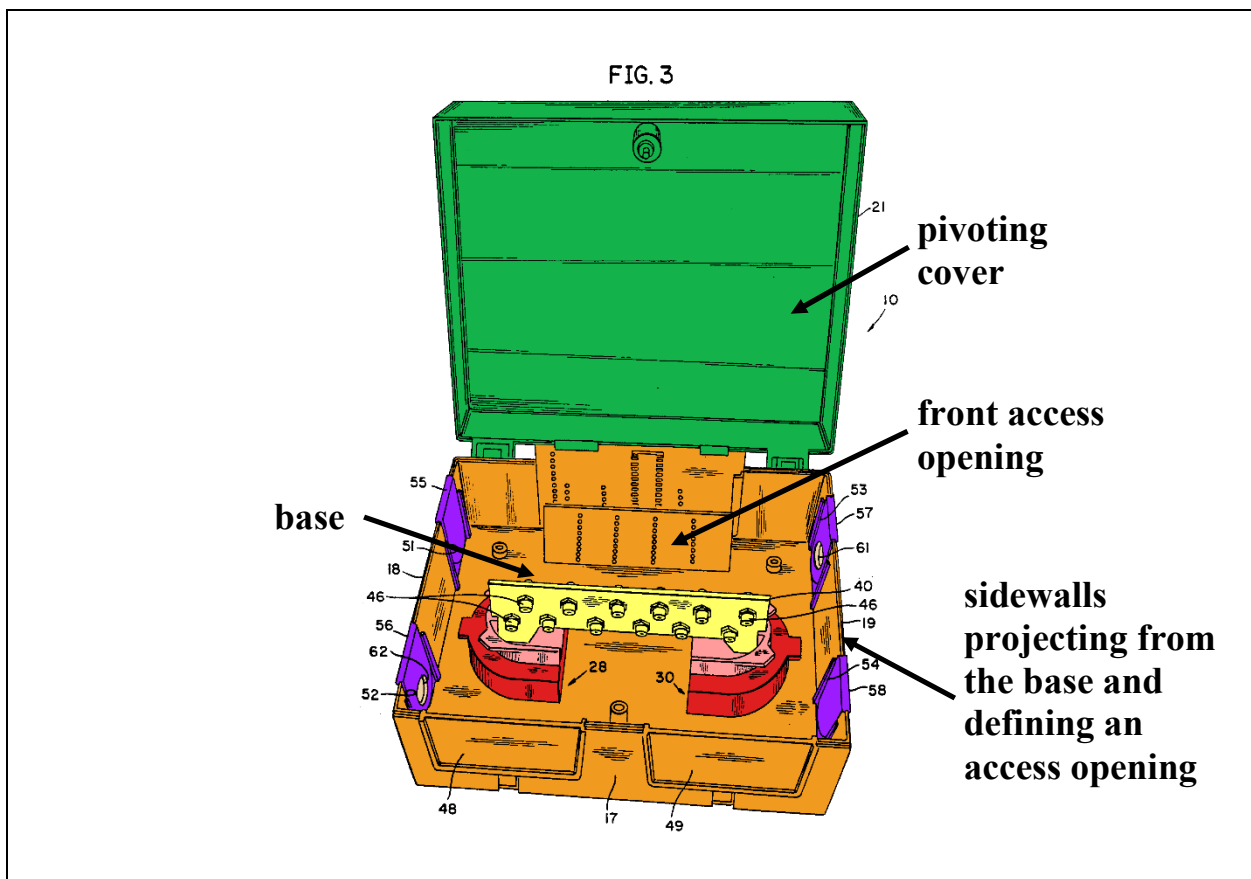


Furthermore, long before the time of the invention of '417 Patent, wall mounted fiber optic enclosures were well known. *See, e.g., Bhatt* (EX1012) 3:51-55 (“bracket means 26 for affixing the wiring center to a wall or post”), FIG. 6; *Noble* (EX1013) Title (“Fiber Optic Wall Mount Cabinet”), Abstract, 1:15-18 (“Fiber optic wall mount cabinets are generally used inside telecommunication closets to facilitate interconnection of plant cable to active equipment such as servers, hubs and routers.”), FIG. 1; *Fritz* (EX1014) Title (“Fiber Optic Wall Mount Cabinet”), Abstract, 1:9-43, FIGS. 1-5. Elderling, ¶95.

In fact, during prosecution of the European equivalent to the '417 Patent,

regarding pending dependent claim 14 that required that the housing be mounted to a wall (EX1010, 214), the Examiner stated that mounting a housing to a wall “is merely one of several straightforward possibilities from which the skilled person would select ... without the exercise of inventive skill, in order to solve the problem posed.” EX1010, 222, ¶3.6; Eldering, ¶96.

Hogan’s interconnect cabinet 10 also includes a base 14 (orange), sidewalls 16, 17, 18, 19 (orange) that project forwardly from the base 14 and define a front access opening. *Hogan*, 2:58-64, FIGS. 2-4; Eldering, ¶97.



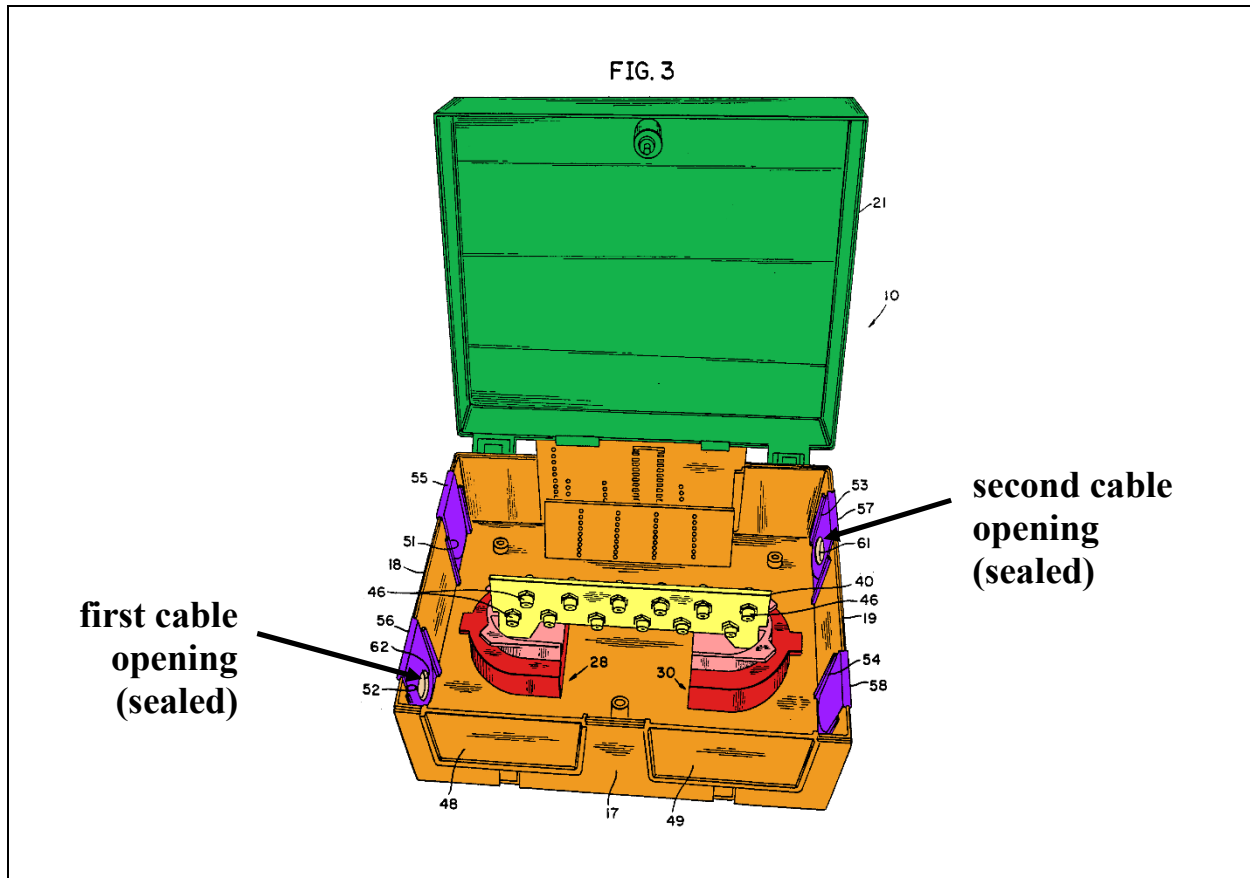
The interconnect cabinet 10 includes a “cover 21 mounted pivotally to the side

As can be seen in FIG. 2 above, the hinges are coupled to sidewall 16 and to the cover 21 to define a pivot axis. *Hogan*, 2:64-66, FIGS. 2-4. This disclosure in *Hogan* renders obvious dependent claims 29 (“wherein a hinge is coupled to one of the sidewalls and to the cover to define the pivot axis”) and 30 (“the hinge is located at a first side of the enclosure arrangement, wherein the cable opening is defined at a second side of the enclosure arrangement, and wherein a corner is defined between the first side of the enclosure arrangement and the second side of the enclosure arrangement”). Eldering, ¶99.

3. *Element 1[B]*

Hogan and *Walters* render obvious Element 1[B]. The disclosure in *Hogan* of Element 1[B] also renders obvious Element 22[A]’s requirement of “the enclosure arrangement defining a cable opening” and dependent claims 6 and 25. Eldering, ¶¶100-103.

Hogan’s enclosure arrangement (interconnect cabinet 10) defines a first cable opening 62 in grommet 56 (purple) in wall 18 (orange) for routing a first cable (e.g., customer (outgoing) optical fibers 13) into the enclosure arrangement 10. *Hogan*, Abstract, 1:61-2:3, 3:66-4:2, 3:44-61, 4:3-9, FIGS. 3-4; Eldering, ¶101.



The first cable opening 62 is formed in a grommet 56, where the opening 62 is provided “for admitting the customer optical fibers 13 (FIG. 4) into the cabinet 10 and for sealingly engaging the customer optical fibers 13.” *Hogan*, 3:66-4:2, FIGS. 3-4. This disclosure in *Hogan* renders obvious dependent claims 6 (“wherein a cable seal is provided at the first cable opening”) and 25 (“wherein a cable seal is disposed at the cable opening for enabling a cable to be routed into the enclosure arrangement”). Elderling, ¶102.

Regarding the claimed “cable seal,” during prosecution of the ’417 Patent, the Examiner stated that “utilizing a cable seal [] provided at the cable opening arranged

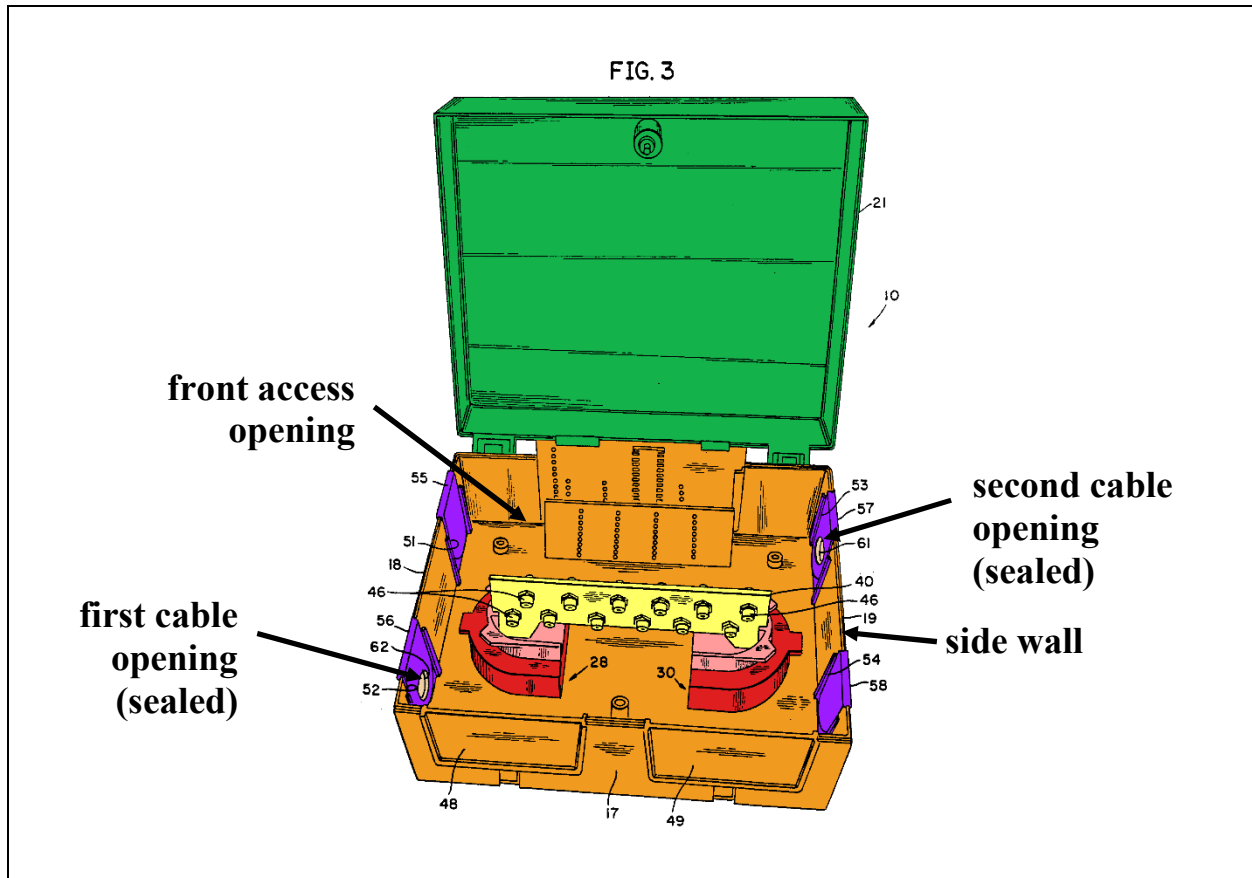
for the fiber optic enclosure is old and well known in the art.” EX1005, 165; Eldering, ¶103.

4. *Element 1[C]*

Hogan and *Walters* render obvious Element 1[C]. The disclosure in *Hogan* of Element 1[C] also renders obvious dependent claims 36 and 37. Eldering, ¶¶104-106.

As can be seen in FIG. 3 below, *Hogan*'s enclosure arrangement (interconnect cabinet 10) also includes a second cable opening 61⁷ in grommet 57 (purple) defined in side wall 19 (orange) for routing a second cable (*e.g.*, telephone company (incoming) optical fibers 12) into the cabinet 10. *Hogan*, Abstract, 1:61-2:3, 3:61-66, 3:44-61, 4:3-9, FIGS. 3-4; Eldering, ¶105.

⁷ The specification (*Hogan*, 3:61-66) incorrectly references element 62 as the second opening that is shown correctly as element 61 in FIG. 3.

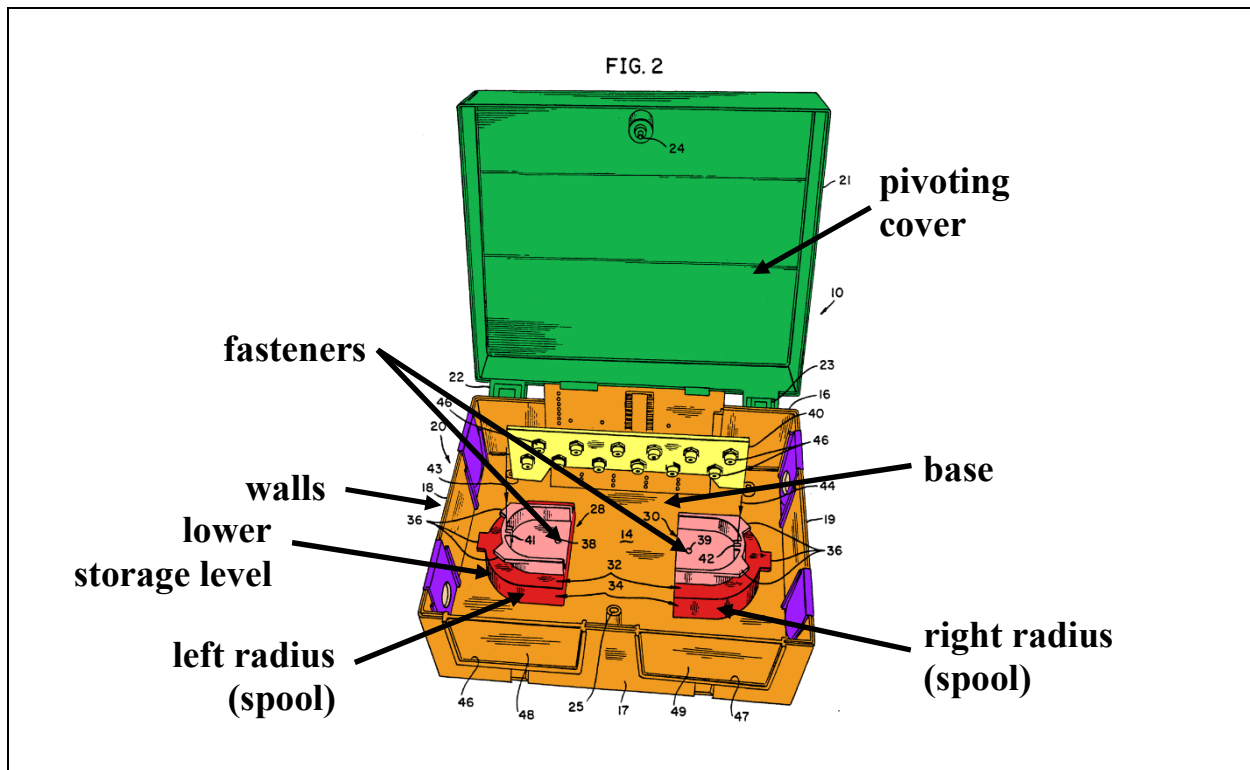


As can also be seen in FIG. 3 above, the second cable opening 61 formed in wall 19 is separate from the front access opening formed by the walls 20 (orange) and separate from the first cable opening 62 defined on side wall 19. *Hogan*, 3:44-4:2, FIGS. 3-4. This disclosure in *Hogan* renders obvious dependent claims 36 (“wherein the second cable opening is separate from the front access opening”) and 37 (“the first and second cable openings are separate from one another, and wherein the first cable opening is defined at least in part by one of the side walls”). *Eldering*, ¶106.

5. *Element 1[D]*

Hogan and *Walters* render obvious Element 1[D]. The disclosures in *Hogan* and *Walters* of Element 1[D] also render obvious Element 22[B]’s requirement of “a cable spool mounted to the enclosure arrangement ... the cable spool including a spooling portion” and dependent claims 23 and 32. Eldering, ¶¶107-114.

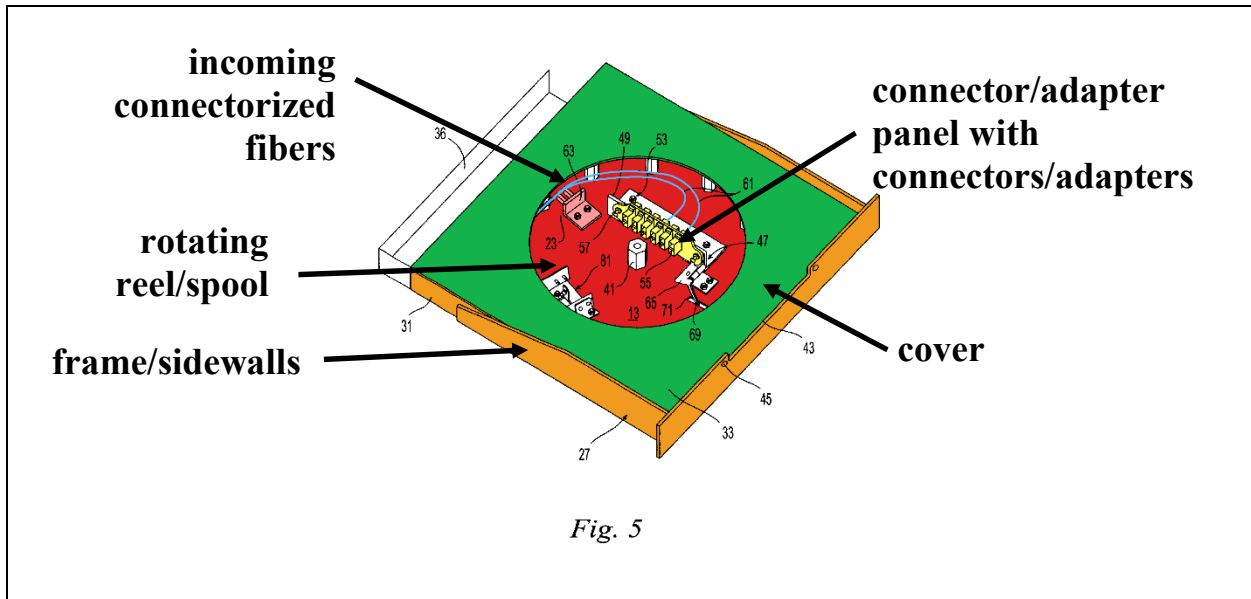
Hogan’s interconnect cabinet 10 includes a spool (radiuses 28 (left) and 30 (right) (red)) defining a spooling portion (formed by the lower storage level 34 of radiuses 28 (left) and 30 (right) (red)) that is mountable to the base 14 (orange) and positioned within the walls 20 (orange). *Hogan*, Abstract, 3:10-25, 4:3-9, FIGS. 2-4; Eldering, ¶108.



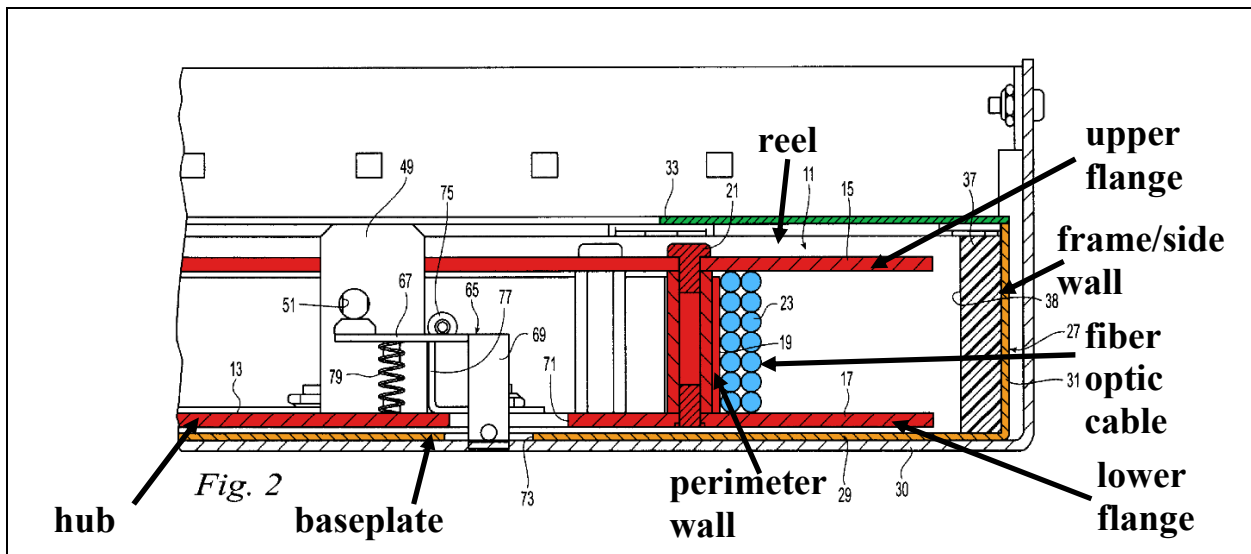
As can be seen in FIG. 2 above, the cable spool (radiuses 28 and 30 (red)) (i)

would be disposed between the base 14 (orange) and the cover 21 (green) when the cover 21 is in the closed position (FIG. 1) and (ii) are at least partially surrounded by the base 14 (orange) and walls 20 (orange). *Hogan*, FIGS. 1-2. This disclosure in *Hogan* renders obvious dependent claims 23 (“wherein the cable spool is disposed between the base and the cover when the cover is in the closed position”) and 32 (“wherein the base and the sidewalls at least partially surround the cable spool”). Because the radiuses 28 and 30 are fastened to the base using threaded fasteners 38 and 39, *Hogan*’s spool does not rotate. *Hogan*, 3:25-27, FIGS. 2-4. Elderling, ¶¶109-110.

On the other hand, *Walters* discloses a cable reel 11 (red) for storing and paying out incoming fiber optic cable 23 (light blue), where the spool/reel is mounted and positioned in frame 27 (orange) with a cover 33 (green) that has a hub that rotates with the reel 11. *Hogan*, Title, Abstract, 1:4-5, 1:22-25, 1:54-58, 1:65-67, 2:5-28, FIGS. 1-2, 5; Elderling, ¶111.



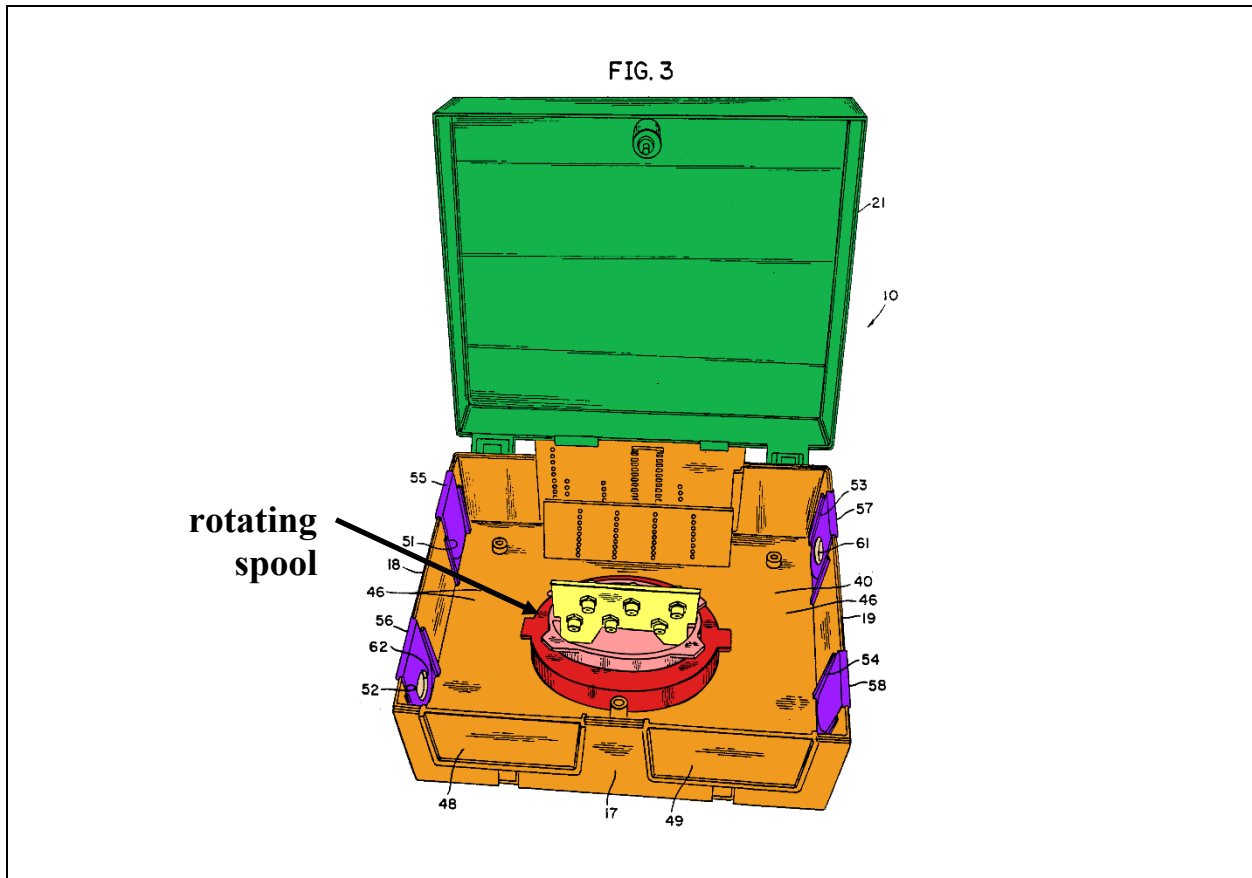
As can be seen in FIG. 2 below, the reel 11 (red) includes a rotatable hub 13 with flanges 15, 17 extending from the hub radially outward and a perimeter wall 19 encircling the hub that defines a spooling portion, with an incoming fiber optic cable 23 (light blue) wrapping around the perimeter wall 19 between the flanges 15, 17 of the reel 11. *Walters*, 2:15-23, FIG. 2; *Eldering*, ¶112.



As can be seen in FIG. 2 above, the reel 11 (red) (i) is disposed between the

baseplate 29 (orange) and the cover 33 (green) when the cover 33 is in the closed position (FIG. 1) and (ii) is at least partially surrounded by the baseplate 29 (orange) and the frame 27/sidewalls 31 (orange). *Walters*, FIG. 2. This disclosure in *Walters* renders obvious dependent claims 23 (“wherein the cable spool is disposed between the base and the cover when the cover is in the closed position”) and 32 (“wherein the base and the sidewalls at least partially surround the cable spool”); Elderling, ¶¶113.

As will be explained with respect to Element 1[H1] (Section VI.B.9), which requires that the spool rotate, a POSITA would have found it obvious based on the teachings of the rotatable reel 11 in *Walters* to modify *Hogan*’s fixedly mounted spool (radiuses 28 and 30) to include a rotatable spool as shown below. Elderling, ¶¶114, 131-145.



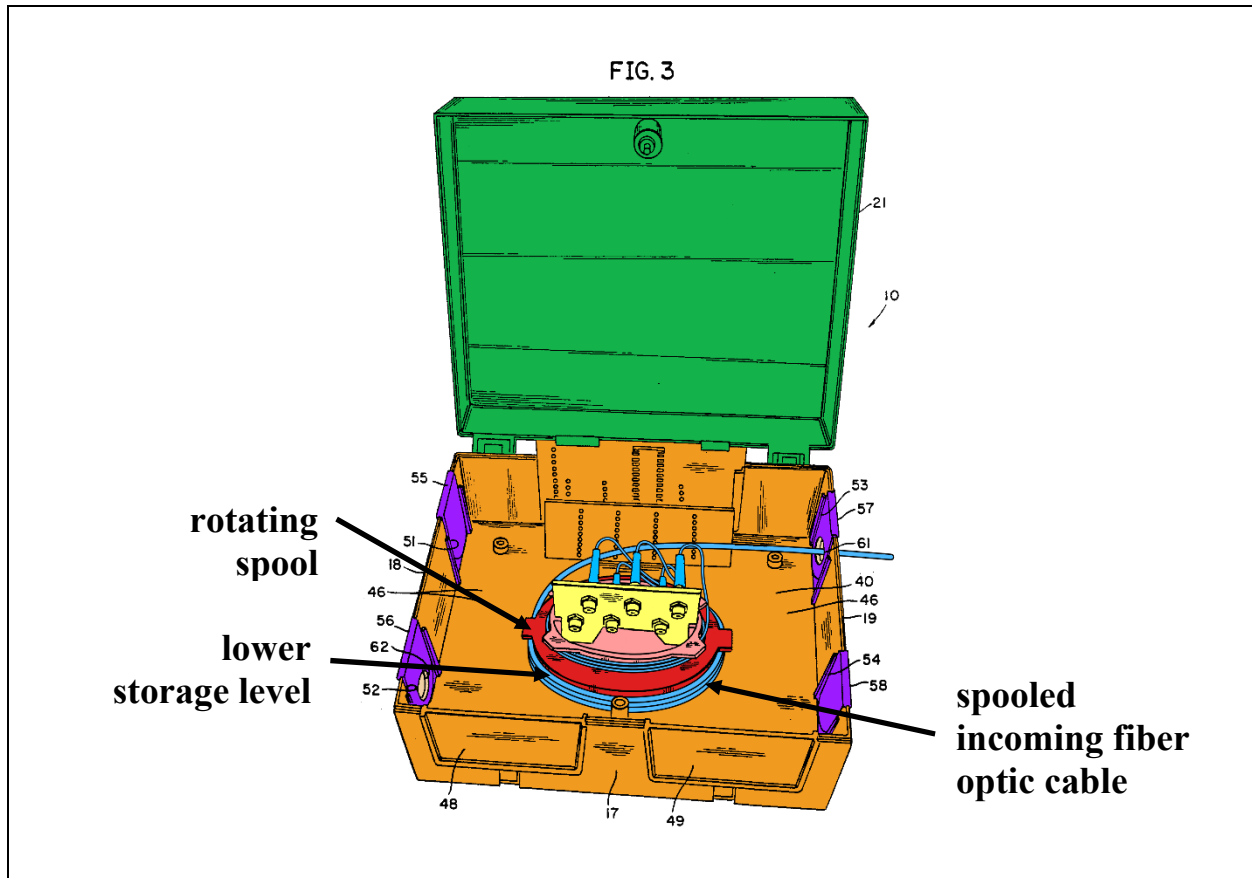
6. Element 1[E]

Hogan and *Walters* render obvious Element 1[E]. The disclosures in *Hogan* and *Walters* of Element 1[E] also render obvious Element 22[C]. *Eldering*, ¶¶115-119.

In *Hogan*'s interconnect cabinet 10, a second fiber optic cable including at least one optical fiber (incoming optical fibers 12 (light blue)) is spooled about the spooling portion of the spool (formed by the lower storage level 34 of radiuses 28 (left) and 30 (right) (red)). *Hogan*, Abstract, 1:61-2:3, 3:14-21, 4:3-9, FIGS. 2-4. *Eldering*, ¶116.

That *Walters* discloses Element 1[E] is supported by the fact that during prosecution of the European equivalent to the '417 Patent, Patent Owner admitted that *Walters* discloses a first fiber optic cable wrapped around a spooling portion of the cable spool. EX1010, ¶2.2, 226, ¶1.1.4 (admitting that elements in amended preamble are disclosed in *Walters* (D1 reference) after rejection based on *Walters*), 232 (amended claim preamble); Eldering, ¶118.

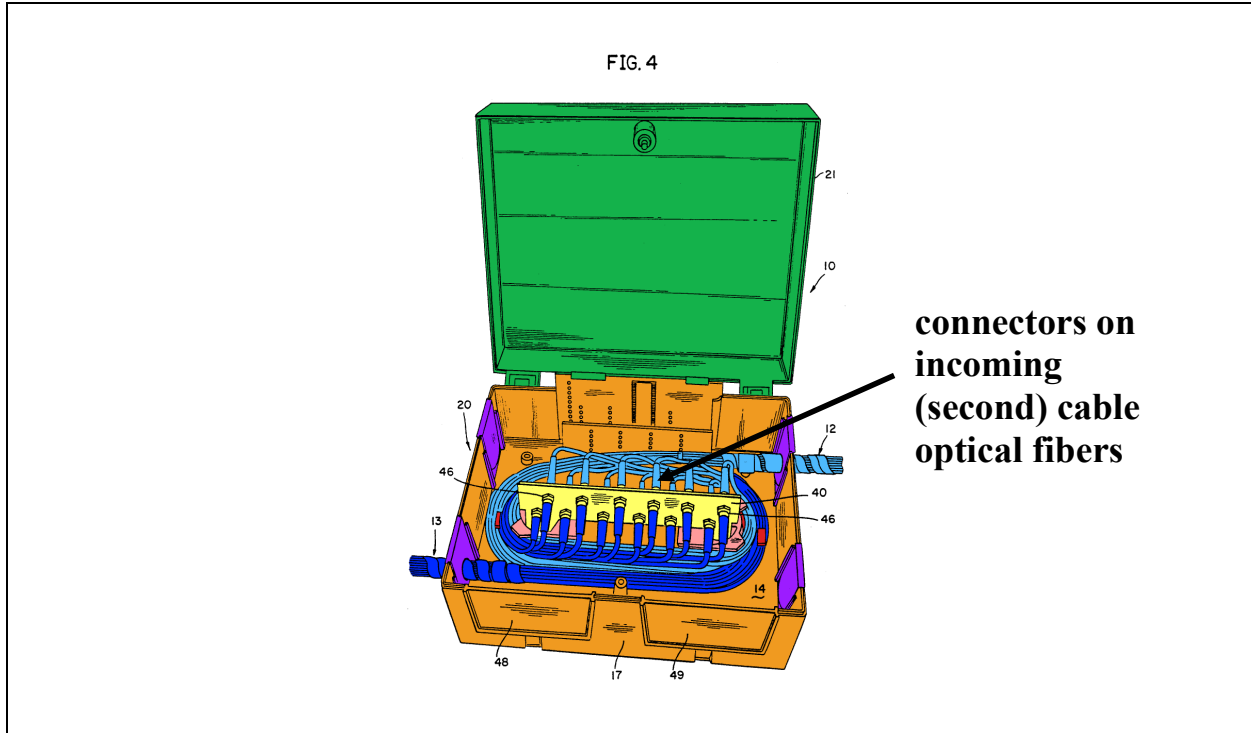
As shown below, in *Hogan*'s modified interconnect cabinet 10, an incoming fiber optic cable (light blue) would be spooled about the spooling portion (lower storage level) of the spool (red) just as disclosed in *Hogan* and *Walters*. Eldering, ¶119.



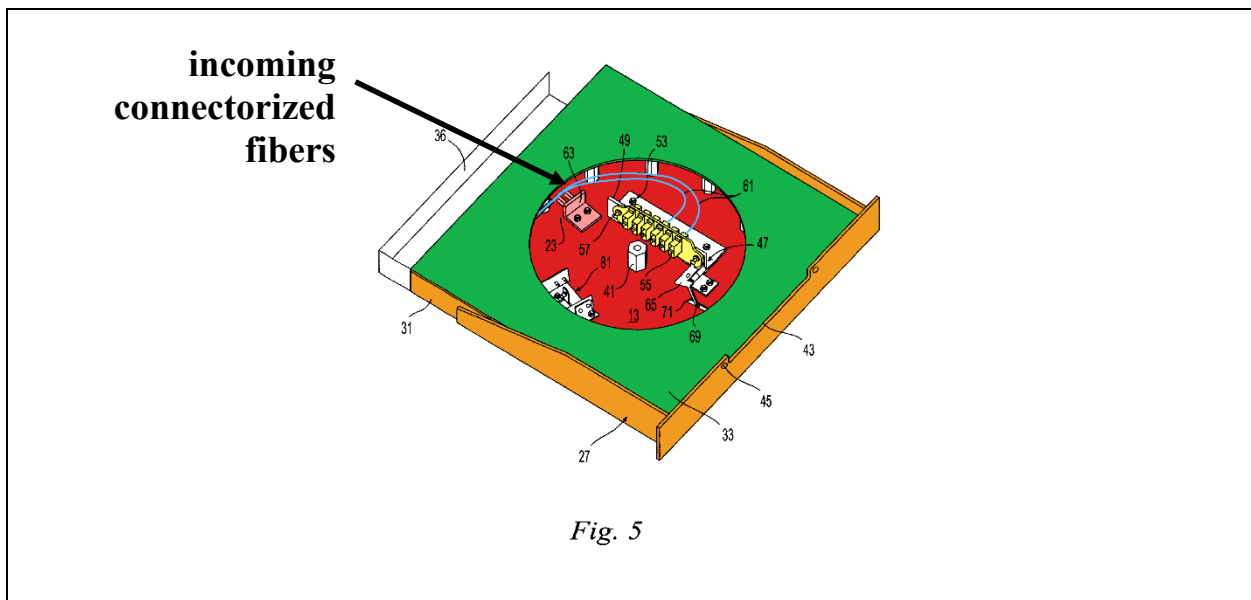
7. *Element 1[F]*

Hogan and *Walters* render obvious Element 1[F]. The disclosures in *Hogan* and *Walters* of Element 1[F] also render obvious Element 22[D]’s requirement of “a fiber optic connector terminating the at least one optical fiber of the fiber optic cable.” Eldering, ¶¶120-123.

Hogan discloses connectors coupled to the ends of the fibers of the second fiber optic cables (incoming optical fibers 12 (light blue)). *Hogan*, Abstract, 1:61-2:3, 2:36-44, 3:17-21, 3:40-44, 4:3-9, FIG. 4; Eldering, ¶121.



Walters also discloses connectors coupled to the end of the second fiber optic cable (incoming cable 23 with individual fibers 61 (light blue)). *Walters*, 2:19-21, 3:6-16, 4:31-37, FIG. 5; Elderling, ¶122.



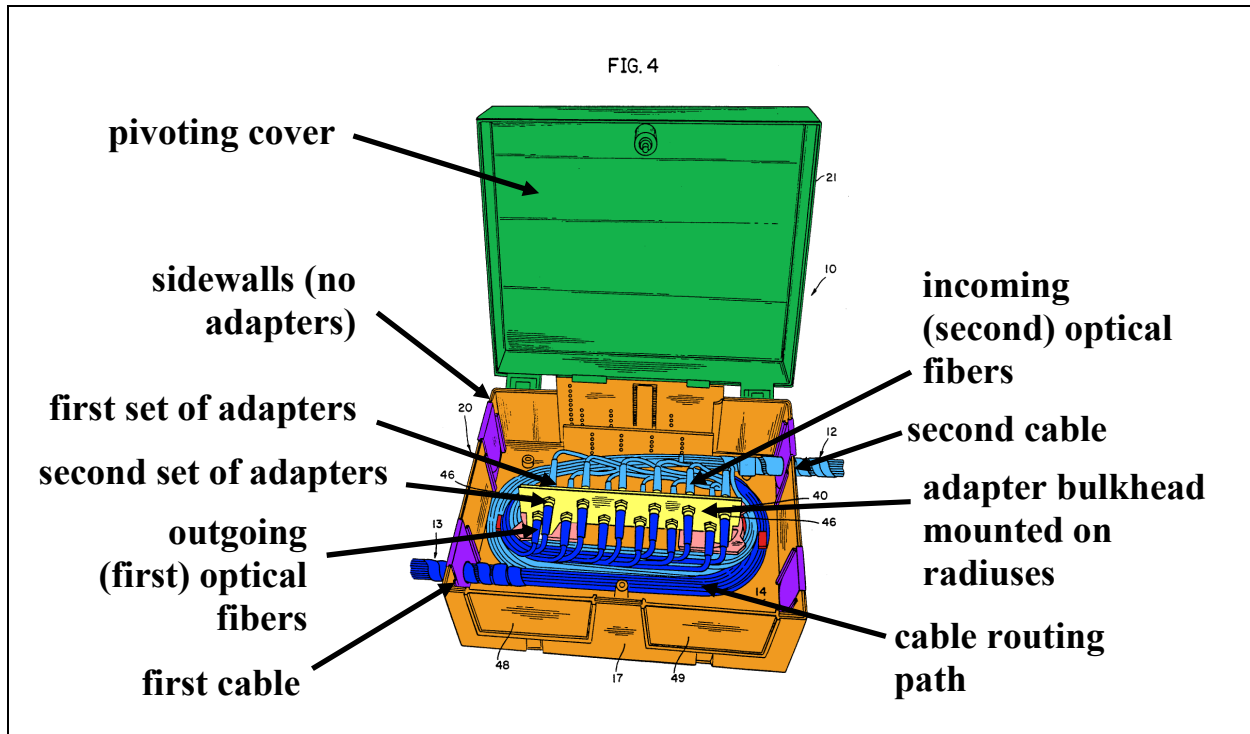
That *Walters* discloses Element 1[F] is supported by the fact that during

prosecution of the European equivalent to the '417 Patent, Patent Owner admitted that *Walters* discloses a fiber optic cable having connectorized ends. EX1010, ¶2.2, 226, ¶1.1.4, 232; *Eldering*, ¶123.

8. *Element 1[G]*

Hogan and *Walters* render obvious Element 1[G]. The disclosures in *Hogan* and *Walters* of Element 1[G] also render obvious Element 22[E] and dependent claims 24, 34, 35, and 38. *Eldering*, ¶¶124-130.

Hogan discloses fiber optic adapters 45 (yellow) provided on an internal bulkhead 40 (yellow) that is mounted on the radiuses 28, 30 (red) and spaced inwardly from the sidewalls 16-19, with a first set of adapters or connector ports (yellow) for receiving the connectors from the incoming optical fibers 12 (light blue) on one side of the bulkhead 40 and a second set of adapters or connector ports (yellow) for receiving connectors from the outgoing optical fibers 13 (blue) on the opposite side. *Hogan*, Abstract, 1:6-10, 1:61-2:3, 2:36-44, 2:58-64, 3:28-35, 3:40-44, 4:9-12, FIGS. 3-4; *Eldering*, ¶125.



As can be seen in FIG. 4 above, the adapters 45 (yellow) are mounted on the bulkhead 40 (yellow) and not on the sidewalls 16-19 (orange), which in the first embodiment disclosed in FIGS. 1-4 are devoid of openings suitable for mounting the adapters 45. *Hogan*, Abstract, 2:36-44, 3:28-39, FIGS. 1-4; *compare id.*, 2:44-57 (second embodiment with adapters on sidewalls), 4:15-26, FIGS. 6-7. This disclosure in *Hogan* renders obvious dependent claim 24 (“wherein the sidewalls are devoid of openings suitable for mounting the fiber optic adapter.”); *Eldering*, ¶126.

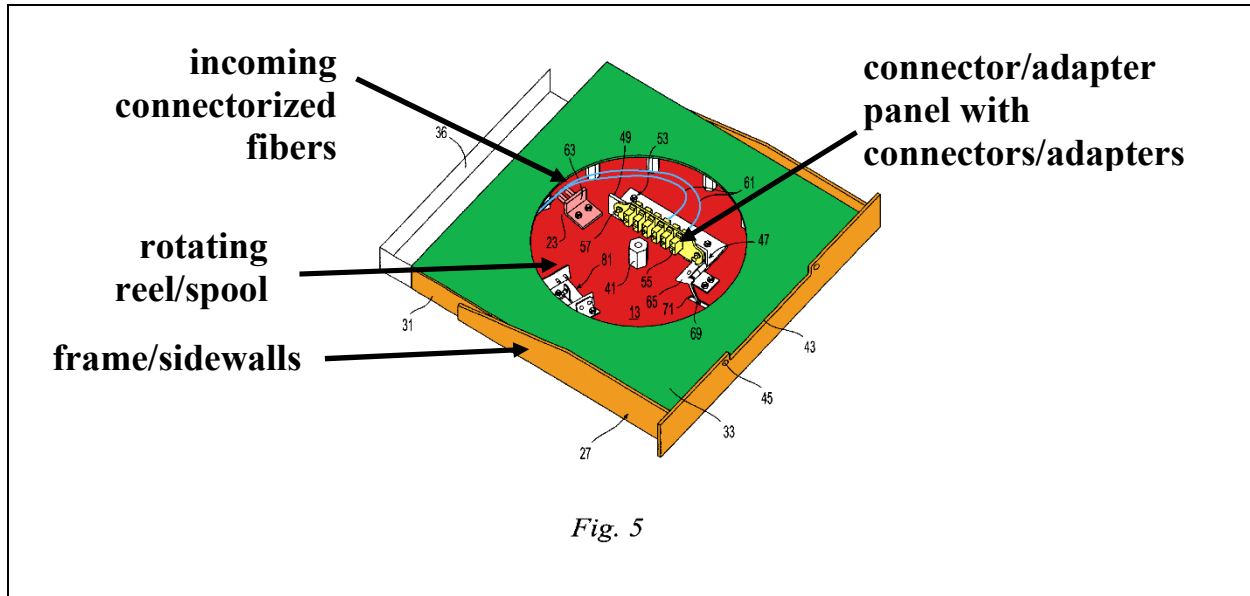
As can be seen in FIG. 4 above, the second set of adapters 45 (yellow) for receiving connectors from the outgoing optical fibers 13 (blue) would be located adjacent to an axial end of the radiuses 28, 30 (red) when the cover 21 (green) is in the closed position (FIG. 1) and the connectorized ends of the outgoing optical fibers

13 (blue) are plugged into the second set of adapters 45 (yellow). *Hogan*, FIG. 4. This disclosure in *Hogan* renders obvious dependent claim 35 (“wherein the fiber optic adapter is located adjacent an axial end of the spool when the cover is in the closed position and the connectorized end is plugged into the second connector port”); Elderling, ¶127.

As can also be seen in FIG. 4 above, *Hogan* discloses a cable routing path for routing the first cable (outgoing optical fibers 13 (blue)) to the second set of adapters 45 (yellow) extending within the interconnect cabinet 10 from the first cable opening 62 (purple) (FIG. 3) to the second set of adapters 45 (yellow). *Hogan*, 3:44-61, 3:66-4:12, FIGS. 3-4; *compare* ’417 Patent 7:47-55, FIGS, 13-14, 17 (showing path for the second subscriber cables 126 from the port 136 to the second connectors 401). This disclosure in *Hogan* renders obvious dependent claims 34 and 38 (“further comprising a cable routing path for routing the first cable to the second connector port of the fiber optic adapter, the cable routing path extending within the enclosure arrangement from the first cable opening to the second connector port of the fiber optic adapter”). Elderling, ¶128.

Walters also discloses fiber optic adapters (connectors sleeves/terminals 55 (yellow)) on connector panel 53 (yellow) that is mounted to the reel 11 (reel) and spaced inwardly from the sidewalls 31 (orange), with a first set of adapters 55 (yellow) for receiving the connectors from the incoming fibers 61 (light blue) on one

side of the connector panel and a second set of adapters 55 (yellow) on the opposite side. *Walters*, Abstract, 1:22-30, 2:23-28, 2:52-61, 2:66-3:11, 3:17-24, 4:34-37, FIGS. 1, 5-6; Eldering, ¶129.



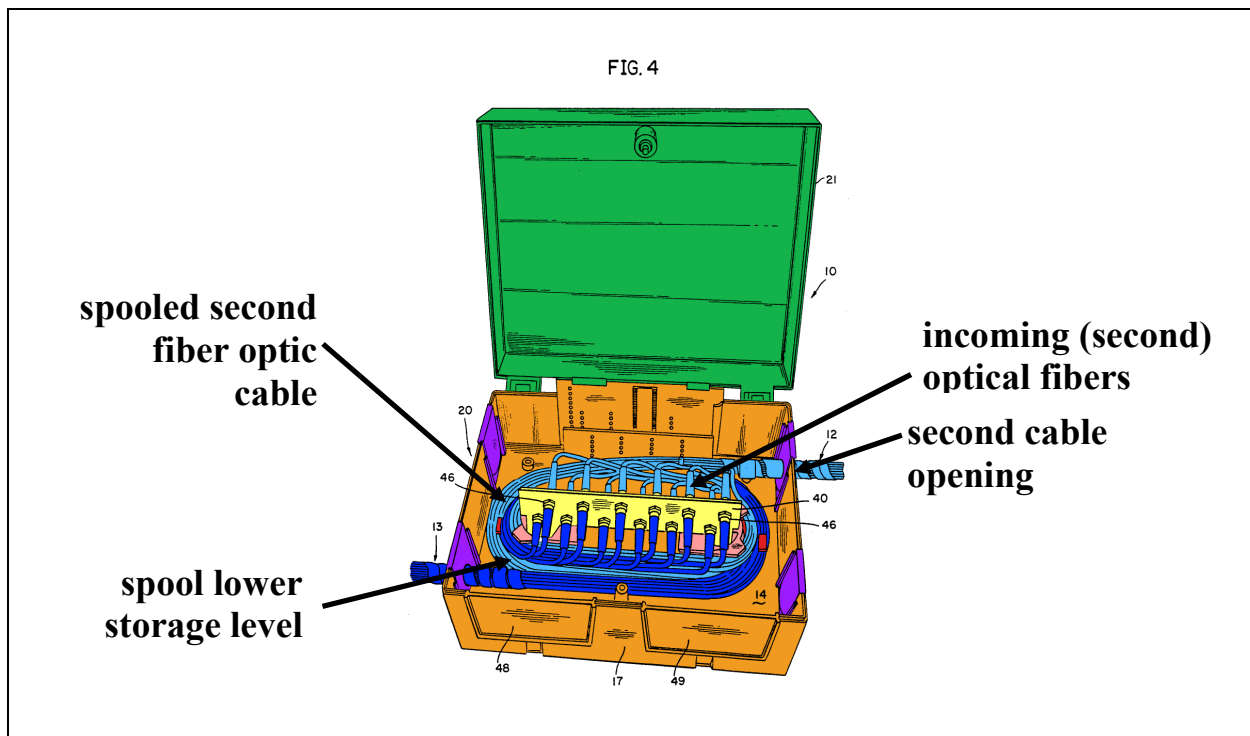
That *Walters* discloses Element 1[G] is supported by the fact that during prosecution of the European equivalent to the '417 Patent, Patent Owner admitted that *Walters* discloses a termination module disposed on the cable spool and a fiber optic cable having connectorized ends that are routed to the termination module. EX1010, ¶2.2, 226, ¶1.1.4, 232; Eldering, ¶130.

9. Element 1[H1]

Hogan and *Walters* render obvious Element 1[H1]. The disclosures in *Hogan* and *Walters* of Element 1[H1] also render obvious Element 22[B]'s requirement that the "cable spool is rotatable relative to the enclosure arrangement about a rotation axis that is transverse to the pivot axis" and dependent claim 33. Eldering, ¶¶131-

145.

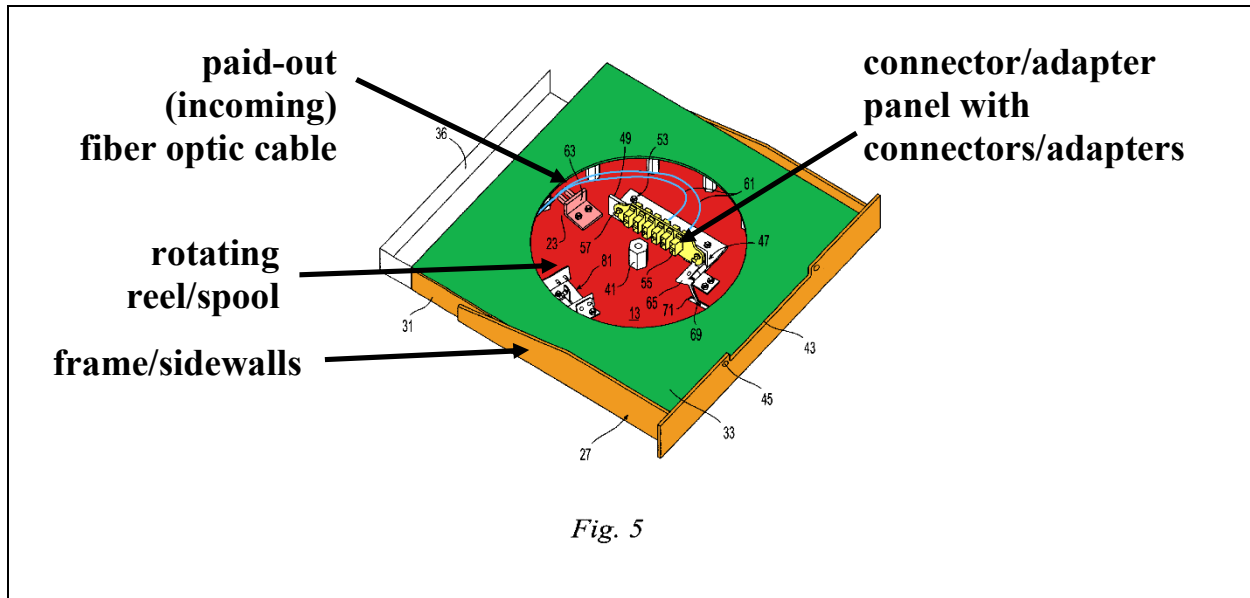
Hogan discloses that the second fiber optic cable (incoming optical fibers 12 (light blue)) is payable from the spool (formed by the lower storage level 34 of radiuses 28 (left) and 30 (right) (red)) through the second cable opening (opening 61 in grommet 57 (purple)) when the spool (radiuses 28, 30) is mounted in the interconnect cabinet 10. *Hogan*, Abstract, 1:61-2:3, 3:10-27, 3:40-66, 4:3-9, FIGS. 3-4; *Eldering*, ¶132.



Because the radiuses 28 and 30 are fastened to the base using threaded fasteners 38 and 39, *Hogan*'s spool does not rotate. *Hogan*, 3:25-27, FIGS. 2-4. *Eldering*, ¶133.

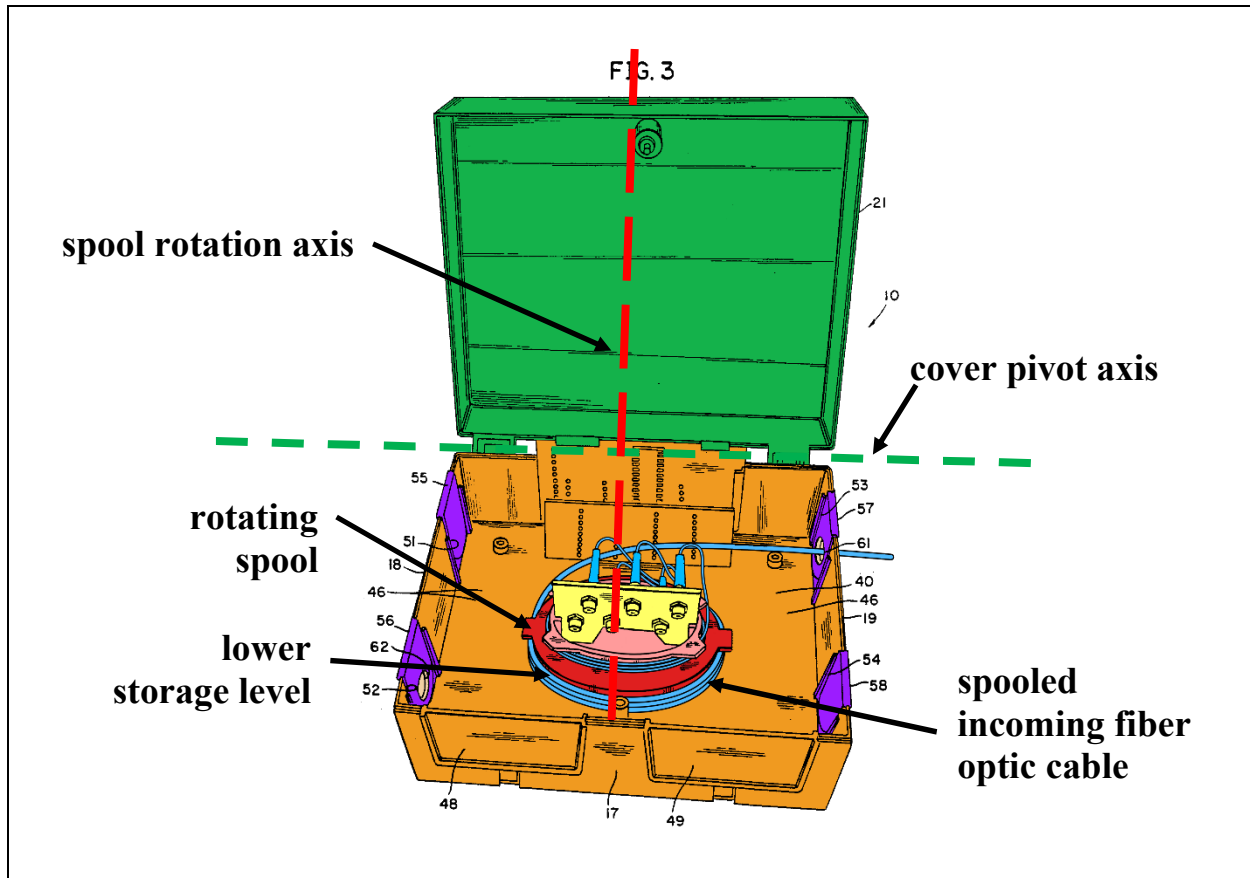
On the other hand, *Walters* discloses that the second (incoming) fiber optic cable 23 including individual fibers 61 (light blue) is paid out from the reel 11 (red)

through access port 35 (FIG. 1) while the reel 11 is mounted in the frame 27 (orange), wherein the reel 11 rotates relative to frame 27 about an axis of rotation as the fiber optic cable 23 is paid out from the reel 11. *Walters*, Title, Abstract, 1:22-30, 2:5-30, 2:40-46, 3:6-16, 4:31-34, 4:49-43, 4:45-47, FIGS. 1-2, 5; *Eldering*, ¶134.



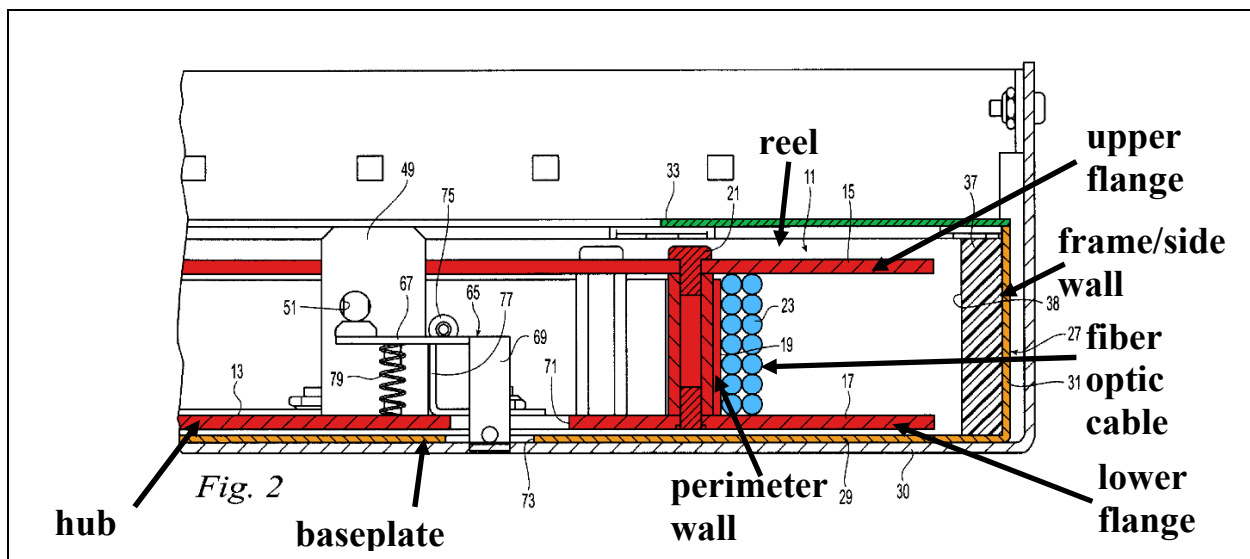
That *Walters* discloses Element 1[H1] is supported by the fact that during prosecution of the European equivalent to the '417 Patent, Patent Owner admitted that *Walters* discloses a cable spool that selectively rotates within a housing. EX1010, ¶2.2, 226, ¶1.1.4, 232; *Eldering*, ¶135.

As will be explained, a POSITA would have found it obvious based on the teachings of the rotatable reel 11 in *Walters* to replace *Hogan's* fixedly mounted spool (radiuses 28 and 30) with a rotatable spool as shown below. *Eldering*, ¶¶136-145.



As can be seen in the figure above, in the modified *Hogan* interconnect cabinet, the rotation axis of the spool (i) is transverse to the pivot axis of the cover, and (ii) and would extend through the access opening and intersect the cover if the cover is disposed in the closed position. This modified *Hogan* interconnect cabinet renders obvious independent claim 22 Element 22[B] (“a cable spool is rotatable relative to the enclosure arrangement about a rotation axis that is transverse to the pivot axis”) and dependent claim 33 (“wherein the cable spool is mounted to the base so that the rotation axis extends through the access opening and intersects the cover when the cover is disposed in the closed position”). Eldering, ¶137.

For clarity and ease of illustration, only a few winds of spooled incoming paid-out fiber optic cable are shown in the figure above. A POSITA would understand that the dimensions of the rotating spool (e.g., its height and diameter) would be designed to accommodate the desired length of paid-out cable (e.g., by increasing the height and/or diameter of the spool as well as the area of the interconnect cabinet if necessary). For example, a POSITA would be motivated to use a rotating spool having a rotatable hub and flanges similar to the reel disclosed in *Walters*. *Walters*, 2:15-23, FIG. 2. Eldering, ¶138.



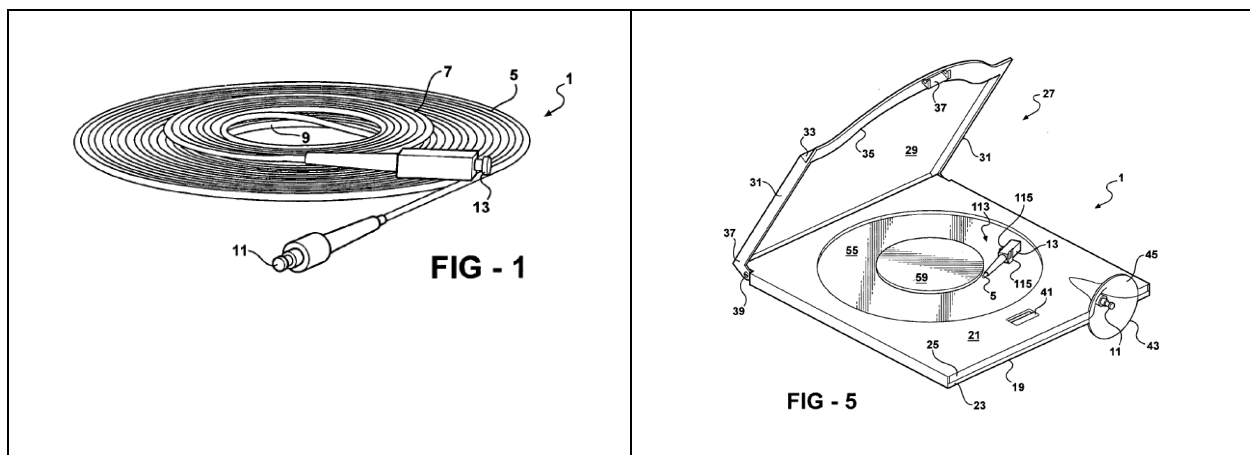
In addition to *Walters*, several other prior art references confirm that a POSITA would have been motivated to use a rotating spool or drum to avoid damaging the optical fibers while manually retracting and paying out, and to accommodate varying lengths of the paid-out fiber optic cable—the same motivation provided in the Background of the '417 Patent. EX1001, 1:38-50 (“[T]here is a need

for a fiber optic enclosure that can effectively manage varying lengths of subscriber cable.”). Elderling, ¶¶139-143.

For example, *Kline* (EX1015), entitled “Fiber Optic Storing and Dispensing Apparatus,” explains in its Background that that care must be taken to avoid bending a fiber optic cable more than the designed minimum bending radius of the cable to prevent physical damage and loss of signal transmissivity, especially when manually coiling and uncoiling fiber optic cable that may result in uncertain bending radii as well as twisting and kinking of the cable. *Kline*, [0004]-[0005], [0007]. *Kline* also explains that the required length of fiber optic cables varies in different environments, which requires the selection of pre-connectorized cables that are greater than the required distance “resulting in excessive sagging of the cable between its ends and requiring the cable, after use, to be recoiled by hand resulting in uncertain bending radii and increasing the risk of damaging the cable.” *Kline*, [0007], [0002]. Elderling, ¶140.

To prevent damage to the fiber optic cable during storage or dispensing, and to accommodate different required lengths of cable, *Kline* teaches an apparatus with “a rotatable spool having two grooves in which relatively long and relatively short lengths of the cable may be coiled.” *Kline* Abstract. “One end of the cable is coupled to a connector that is releasably retained on the spool for rotation therewith,” while “[t]he opposite end of the cable is joined to a connector which is extendible from

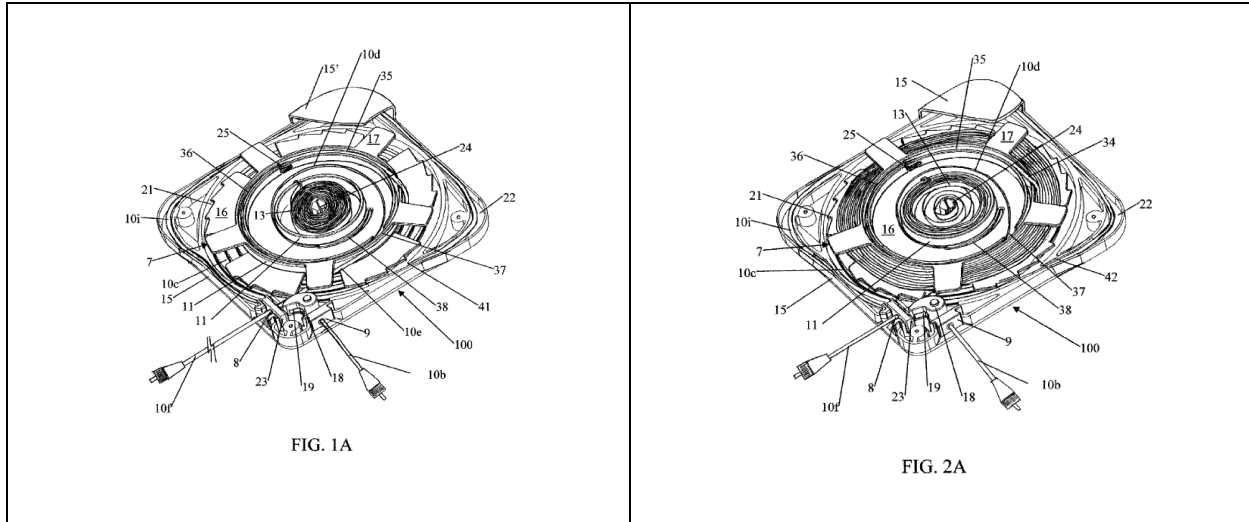
and retractable into the casing in which the spool is journaled.” *Kline*, Abstract, [0001], [0009], [0024], [0027] (“The apparatus includes a spool 53 on and from which the cable 3 may be wound and unwound”), [0037] (“Although the entire spool 53 will rotate, there will be no twisting of the cable transition section 9 or any other part of the cable. Consequently, there will be no twisting or kinking of any part of the cable.”), FIGS. 1, 5; *Eldering*, ¶141.



Similarly, *Kewitsch* (EX1016), entitled “Fiber Optic Storing and Dispensing Apparatus,” also explains in its Background that care must be taken in handling fiber optic cables to avoid sharp bends that exceed the designed minimum bending radius of the cable to prevent physical damage, signal attenuation, etc. *Kewitsch*, 1:28-38. *Kewitsch* also explains that since “[o]ptical fiber cables can not be readily cut to length in the field, nor can they be simply folded to take up excess length,” “techniques to mitigate damage to fiber optic cables address an important problem.” *Kewitsch*, 1:43-52. Before disclosing its own retractable fiber optic cable with

rotating spool solution, *Kewitsch* acknowledged that there had already been “several attempts to provide optical systems with retractable fiber optic cables, that is, cables wherein excess lengths are automatically wound onto a spool.” *Kewitsch*, 1:53-57. Accordingly, by the time of the invention of the ’417 Patent (2017) (and long after *Hogan* issued in 1992), a POSITA would have understood and been motivated by the fact that “[s]ignificant optical network performance and cost advantages are derived by the ability to retract a variable length of un-interrupted optical fiber cable in a convenient and cost effective manner.” *Kewitsch*, 2:38-41; *Eldering*, ¶142.

Given this motivation, *Kewitsch* discloses “a fiber optic rotary joint and applications of such to retractable fiber optic cables” that “can be used, for example, with a rotating spool to provide a continuous retractable and extendable cable.” *Kewitsch*, Abstract, 1:15-20, 2:50-67 (“It is an object of the present invention to provide a fiber optic rotary unit comprised of one or more continuous lengths of optical fiber and to provide a retractable, coiled fiber optic cable assembly including the rotary unit therein. The retractable cable assembly protects excess lengths of fiber optic cable in a low loss and convenient fashion.”), 4:7-12, 4:30-32, FIGS, 1A-2B; *Eldering*, ¶143.



Accordingly, a POSITA would have been motivated based on the teachings of the rotatable reel 11 in *Walters* to replace *Hogan's* fixedly mounted spool (radiuses 28 and 30) with a rotatable spool like that disclosed in *Walters* to accommodate varying lengths of the paid-out fiber optic cable and to avoid manual coiling and recoiling of the fiber optic cable to avoid signal attenuation and damaging the cable by maintaining its minimum bend radius. Eldering, ¶144.

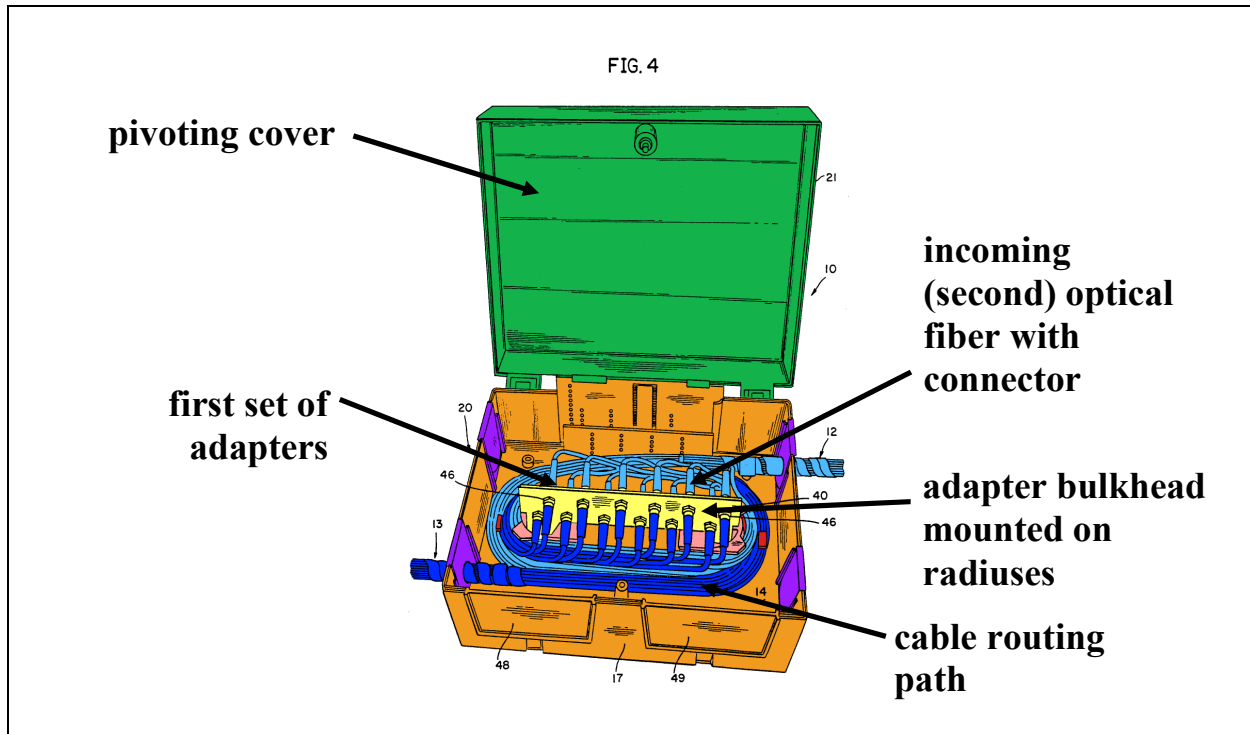
Incorporating a rotating spool into *Hogan* is merely the application of a known technique (using a rotating spool to store, retract, and pay out fiber optic cables) to a known device (*Hogan's* interconnect cabinet 10) ready for improvement to yield improved and predictable results (protecting the fiber optic cable from signal attenuation and damage during storage, retraction, and paying out). *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007). A POSITA would only need to engage ordinary creativity to incorporate a rotating spool into *Hogan's* interconnect cabinet. *KSR*, 550 U.S. at 421 (“A person of ordinary skill is also a person of ordinary

creativity, not an automaton.”). A POSITA would have a reasonable expectation of success since *Walters* already disclosed a rotating reel 11 for storing and paying out a fiber optic cable. Eldering, ¶145.

10. *Element 1[H2]*

Hogan and *Walters* render obvious Element 1[H2]. The disclosures in *Hogan* and *Walters* of Element 1[H2] also render obvious Element 22[D]’s requirement of “the fiber optic connector rotating in unison with the cable spool when the cable spool rotates about the rotation axis” and dependent claims 3, 4, and 5. Eldering, ¶¶146-154.

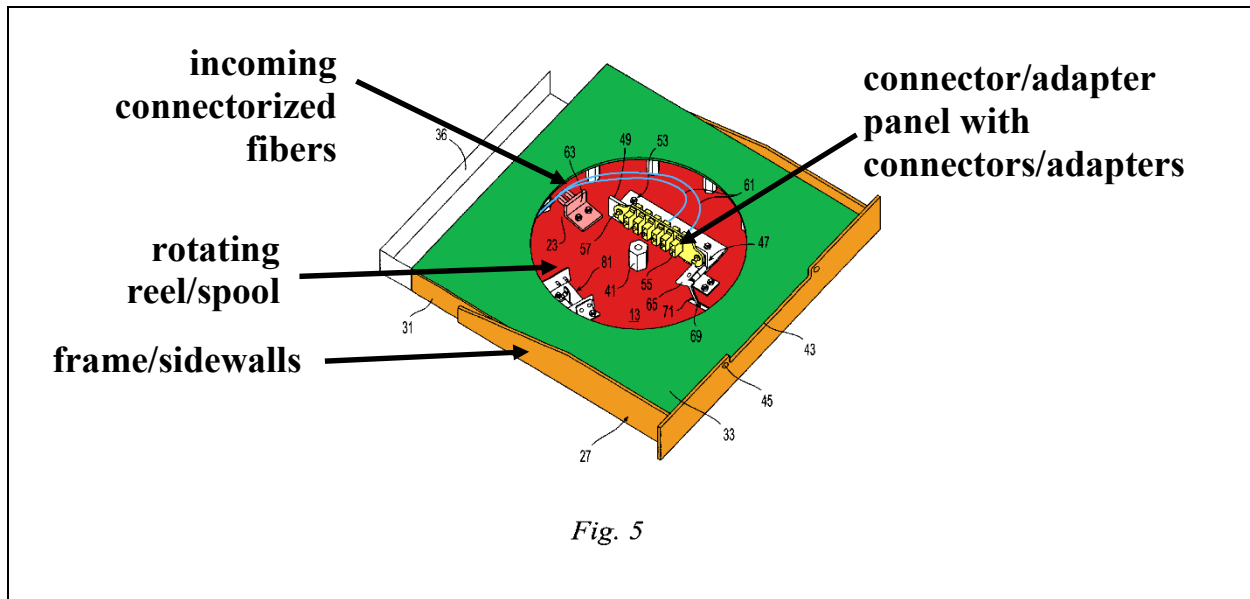
Element 1[H2] recites that the fiber optic connector on the second fiber optic cable rotates in concert with the spool as the second fiber optic cable is paid out from the spool. *Hogan* teaches fiber optic connectors coupled to the ends of the fibers of the second fiber optic cable (incoming optical fibers 12 (light blue)) as discussed for Element 1[F]. *Hogan*, Abstract, 1:61-2:3, 2:36-44, 3:17-21, 3:40-44, 4:3-9, FIG. 4. *Hogan* also renders obvious fiber optic adapters 45 (yellow) on a bulkhead 40 mounted to the spools (radiuses 28, 30) and connected to the fiber optic connectors as discussed for Element 1[G]. *Hogan*, Abstract, 1:6-10, 1:61-2:3, 2:36-44, 2:58-64, 3:28-35, 3:40-44, 4:9-12, FIGS. 3-4; Eldering, ¶147.



Accordingly, *Hogan* teaches that both (i) the fiber optic connectors coupled to the ends of the fibers of incoming optical fibers 12 (light blue) and (ii) the fiber optic adapters 45 (yellow) to which the connectors connect are all fixed to the spool (radiuses 28, 30), which is fixedly mounted to the base 14 (orange). *Hogan*, 3:25-27, FIGS. 2-4; *Eldering*, ¶148.

As also discussed for Element 1[F], *Walters* teaches fiber optic connectors coupled to the end of the fibers 61 of the incoming fiber optic cable 23 (light blue). *Walters*, 2:19-21, 3:6-16, 4:31-37, FIG. 5. And as discussed for Element 1[G], *Walters* teaches fiber optic adapters 55 (yellow) on connector panel 53 (yellow) mounted to the reel 11 using a reel docking station 47 and connected to the fiber optic connectors. *Walters*, Abstract, 1:22-30, 2:23-28, 2:52-61, 2:66-3:11, 3:17-24,

4:34-37, FIGS. 1, 5-6; Eldering, ¶149.

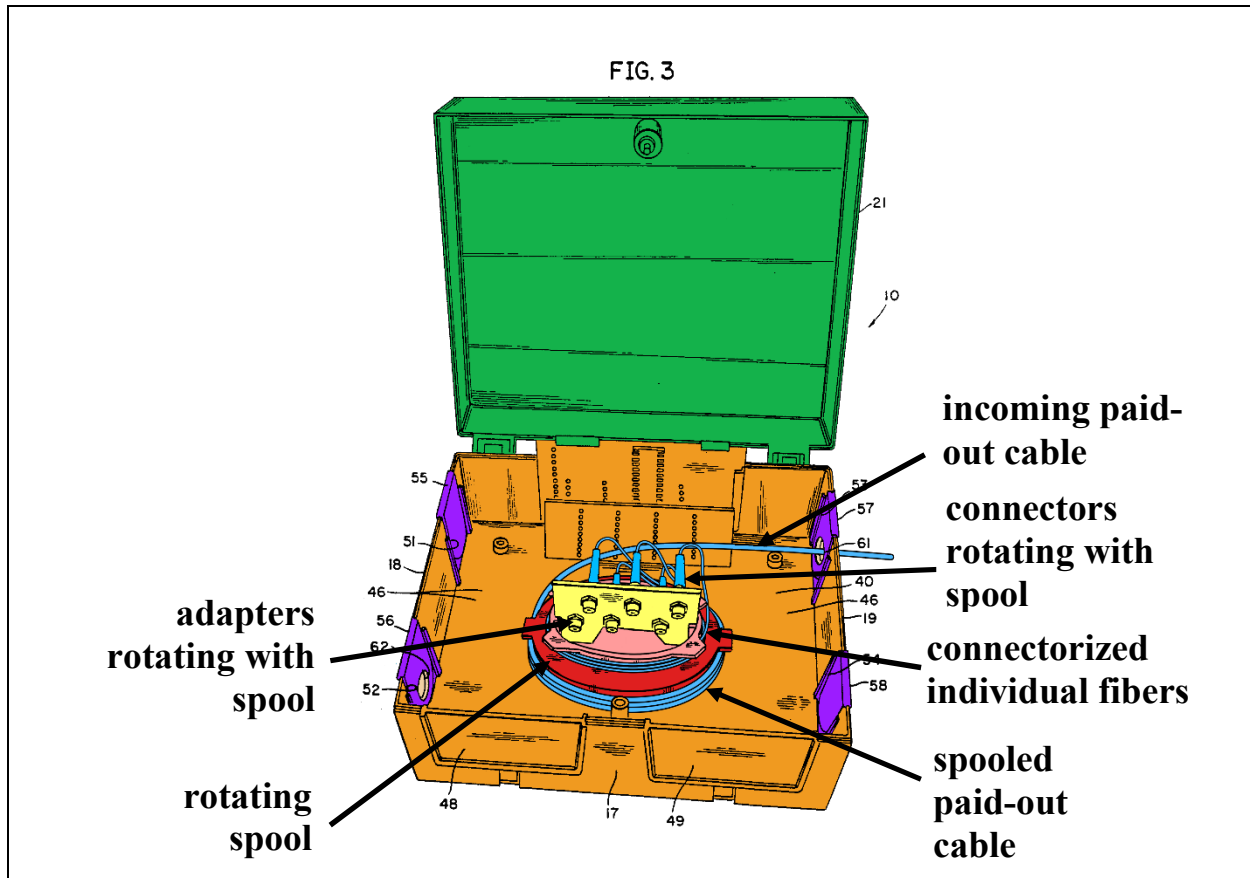


Because the connector panel 53 (and mounted adapters 53 and connected connectors of cable 23) is mounted to the rotating reel 11 using a reel docking station 47, *Walters* expressly teaches that the fiber optic connectors on the end of the fibers 61 of the incoming fiber optic cable 23 (light blue) rotate in concert (or in unison) with the reel 61 as the fiber optic cable 23 is paid out from the spool. *Walters*, Abstract (“The connector panel will fit on a reel docking station for rotation with the reel.”), 1:22-30 (“A reel docking station is located on the reel for rotation with it. When mounted to the reel docking station ... the connector panel will rotate with the reel.”); 2:52-56 (“Referring to FIGS. 1 and 6, a reel docking station 47 is mounted to hub 13 for rotation with reel 11.”), 2:57-61, 2:66-3:11, 3:17-24, 4:34-37, 4:39-43, FIGS. 1, 5; Eldering, ¶150.

That *Walters* discloses Element 1[H2] is supported by the fact that during

prosecution of the European equivalent to the '417 Patent, Patent Owner admitted that *Walters* discloses a termination (adapter) module disposed on the cable spool so that the termination module rotates in concert/unison with the cable spool and that the fiber optic cable has connectorized ends that are routed to the rotating termination module. EX1010, ¶2.2, 226, ¶1.1.4, 232; Elderling, ¶152.

Accordingly, in the modified interconnect cabinet 10 in *Hogan* with the rotating spool, a POSITA would have found it obvious based on the express teachings of *Hogan* (*i.e.*, coupled adapters and fiber optic cable connectors supported on a fixed spool) and *Walters* (*i.e.*, coupled adapters and fiber optic cable connectors supported on a rotating spool), to have fiber optic connectors on the ends of the incoming fibers (light blue) on the paid-out fiber optic cable and the adapters (yellow) rotate in concert/unison with the spool as the fiber optic cable is paid out from the spool as shown below. This modified *Hogan* interconnect cabinet renders obvious dependent claims 3 (“wherein the fiber optic connector is supported on the spool when the fiber optic cable is paid out from the spool”), 4 (“wherein the fiber optic adapter is coupled to the fiber optic connector, and wherein the fiber optic adapter rotates in concert with the spool as the fiber optic cable is paid out from the spool”), and 5 (directed to a plurality of connectors and adapters rotating in unison). Elderling, ¶152.



A POSITA would understand based on *Walters* that having the adapters and fiber optic cable connectors attached to and moving in unison/concert with the rotating reel/spool would prevent the paid-out cable and its connectorized individual fibers from experiencing strain or damage when the cable was being retracted or paid out. Eldering, ¶153.

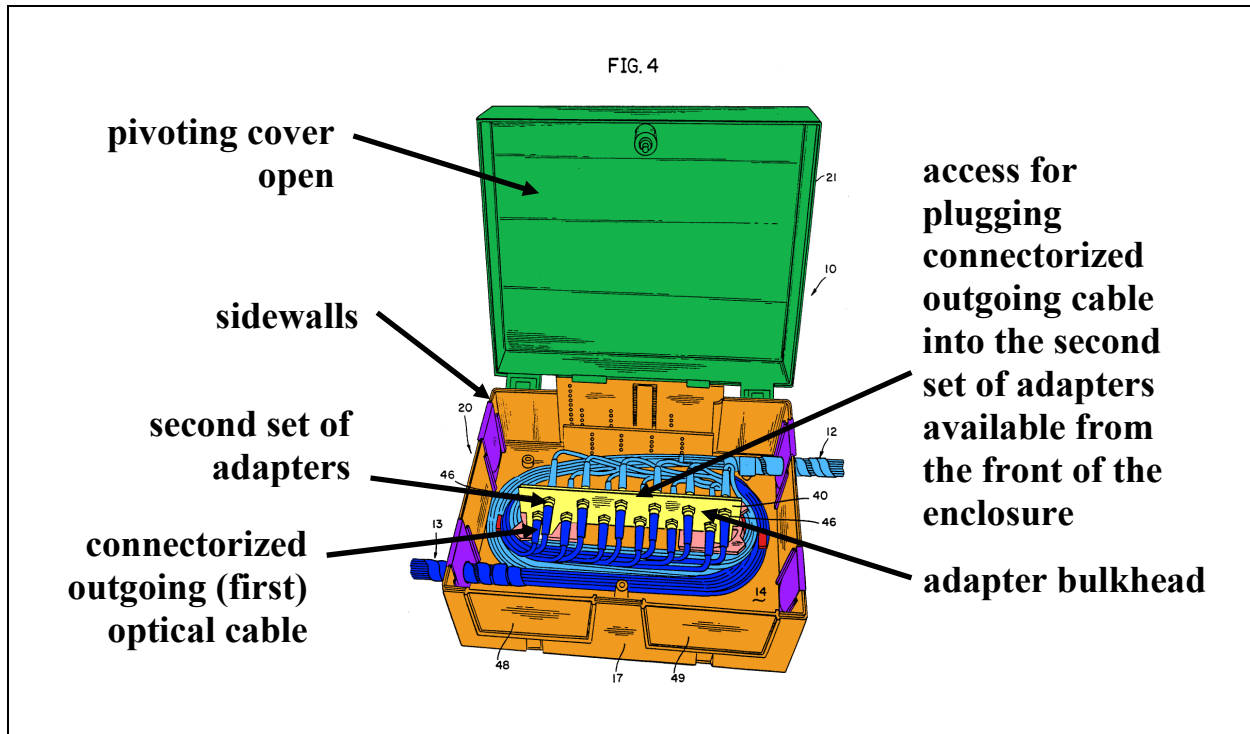
In addition to *Walters*, other prior art references confirm that a POSITA would be motivated to have connectors and adapters rotating with the spool while retracting or paying out cable. *See, e.g., Hendrickson (EX1017) 3:1-8, 3:18-36* (“The cable drop box 10 also has an interface compartment 30 that is disposed atop the drum

region 20, and which has a peripheral side wall 31.”), 4:8-51 (“This construction allows a single worker easily to pay out a cable wound on the drum region 20, as may be necessary for a network deployment at a MDU.”), FIGS. 1-7; Eldering, ¶154.

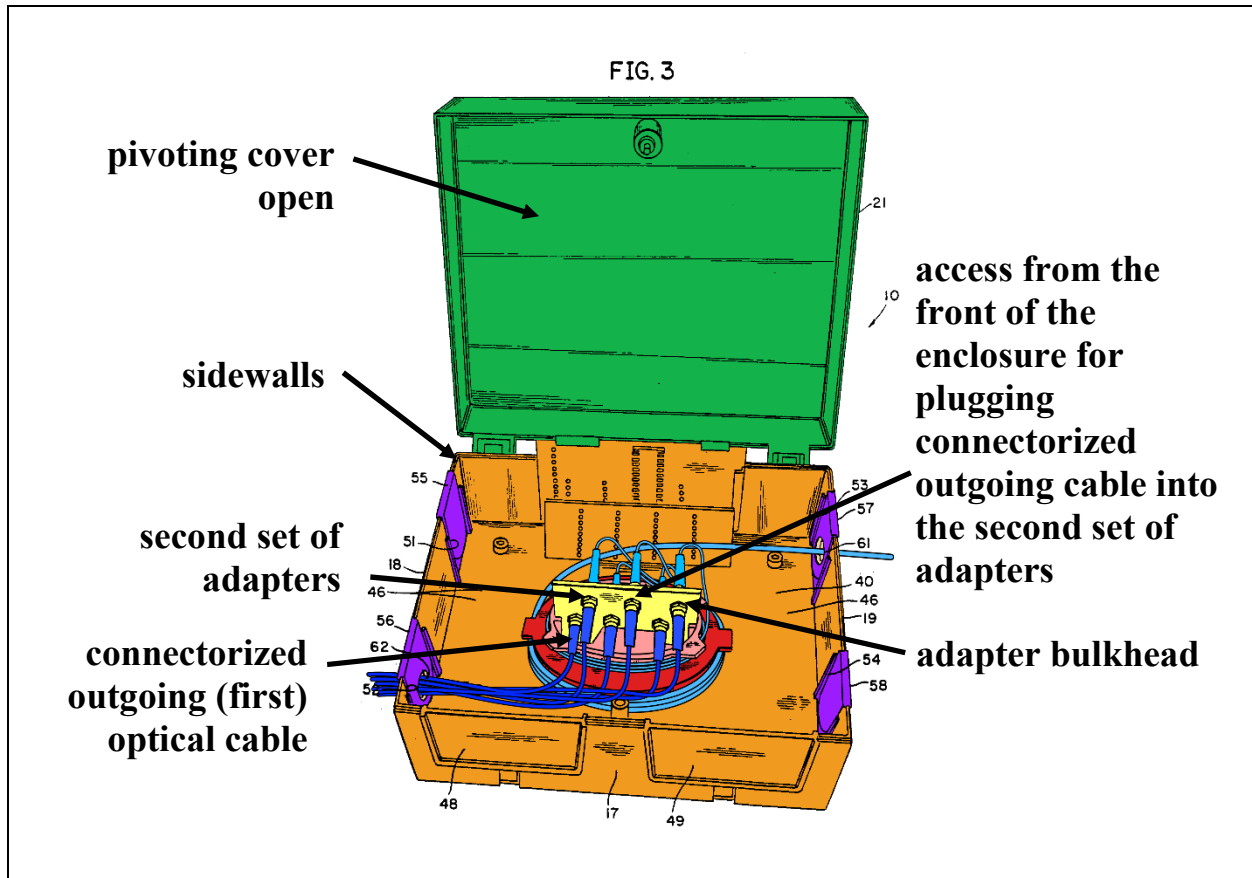
11. Element 1[I]

Hogan and *Walters* render Element 1[I] obvious. The disclosures in *Hogan* and *Walters* of Element 1[I] also render obvious Element 22[F]’s requirement of a “cover extending across the fiber optic adapter when disposed in the closed position.” Eldering, ¶155-158.

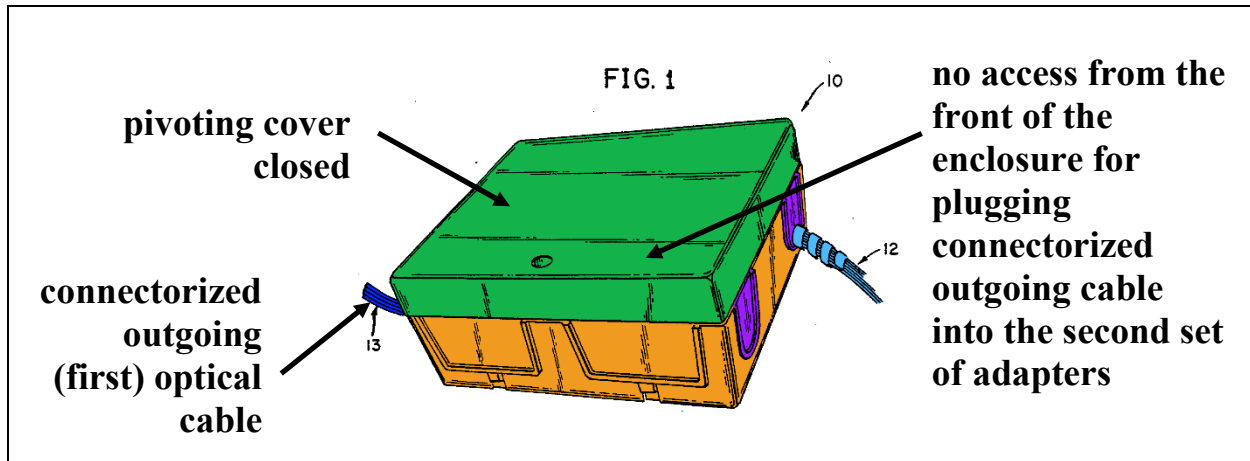
Hogan’s interconnect cabinet 10 provides access from the front of the cabinet 10 for plugging a connectorized end of the outgoing (first) optical fibers 13 (blue) into the second set of adapters 45 (yellow) while the adapters 45 are spaced inwardly from the sidewalls 16-19 (orange) when the cover 21 (green) is in the open position. *Hogan*, 1:56-2:3, 2:64-66, 3:40-44, 4:3-12, FIGS. 2-4; Eldering, ¶156.



As shown below, *Hogan's* modified interconnect cabinet 10 would still provide access from the front of the cabinet for plugging a connectorized end of the outgoing (first) optical fibers (blue) into the second set of adapters (yellow) while the adapters are spaced inwardly from the sidewalls (orange) when the cover (green) is in the open position; Elderling, ¶157.



When the cover 21 (green) is in the closed position (FIG. 1) and extending across the adapters inside the interconnect cabinet 10, the disclosed cabinet 10 (and the modified version) would not provide access from the front of the cabinet for plugging a connectorized end of the outgoing (first) optical fibers (blue) into the second set of adapters (yellow) while the adapters are spaced inwardly from the sidewalls (orange). Hogan, 1:53-55, 2:64-3:1, 4:12-14, FIG. 1; Elderling, ¶158.



C. Independent Claim 22

Hogan and *Walters* render obvious independent claim 22. The claim elements of independent claim 22 were all addressed in the previous section (Section VI.B) demonstrating how *Hogan* and *Walters* render obvious independent claim 1. *Eldering*, ¶¶159-166.

1. Element 22[Preamble]

The disclosure in *Hogan* of Element 1[Preamble] also renders obvious Element 22[Preamble] for the reasons discussed in Section VI.B.1. *Eldering*, ¶¶91-92, 160.

2. Element 22[A]

The disclosure in *Hogan* of Element 1[A] also renders obvious Element 22[A] (except for “the enclosure arrangement defining a cable opening”) for the reasons discussed in Section VI.B.2. *Eldering*, ¶¶93-99, 161. The disclosure in *Hogan* of Element 1[B] also renders obvious Element 22[A]’s requirement of “the enclosure

arrangement defining a cable opening” for the reasons discussed in Section VI.B.3. Elderling, ¶¶100-103, 161.

3. *Element 22[B]*

The disclosures in *Hogan* and *Walters* of Element 1[D] also render obvious Element 22[B]’s requirement of “a cable spool mounted to the enclosure arrangement ... the cable spool including a spooling portion” for the reasons discussed in Section VI.B.5. Elderling, ¶¶107-114, 162. The disclosures in *Hogan* and *Walters* of Element 1[H1] also render obvious Element 22[B]’s requirement that the “cable spool is rotatable relative to the enclosure arrangement about a rotation axis that is transverse to the pivot axis” for the reasons discussed in Section VI.B.9. Elderling, ¶¶131-145, 162.

4. *Element 22[C]*

The disclosures in *Hogan* and *Walters* of Element 1[E] also render obvious Element 22[C] for the reasons discussed in Section VI.B.6. Elderling, ¶¶115-119, 163.

5. *Element 22[D]*

The disclosures in *Hogan* and *Walters* of Element 1[F] also render obvious Element 22[D]’s requirement of “a fiber optic connector terminating the at least one optical fiber of the fiber optic cable” for the reasons discussed in Section VI.B.7. Elderling, ¶¶120-123, 164. The disclosures in *Hogan* and *Walters* of Element 1[H2]

also render obvious Element 22[D]’s requirement of “the fiber optic connector rotating in unison with the cable spool when the cable spool rotates about the rotation axis” for the reasons discussed in Section VI.B.10. Eldering, ¶¶146-154, 164.

6. *Element 22[E]*

The disclosures in *Hogan* and *Walters* of Element 1[G] also render obvious Element 22[E] for the reasons discussed in Section VI.B.8. Eldering, ¶¶124-130, 165.

7. *Element 22[F]*

The disclosures in *Hogan* and *Walters* of Element 1[I] also render obvious Element 22[F]’s requirement of a “cover extending across the fiber optic adapter when disposed in the closed position” for the reasons discussed in Section VI.B.11. Eldering, ¶¶155-158, 166.

D. Dependent Claims 2-6, 23-25, and 29-38

Hogan and *Walters* render obvious dependent claims 2-6, 23-25, and 29-38 for the reasons discussed for independent claim 1 in Section VI.B. Eldering, ¶¶167-192.

1. *Dependent Claims 2 and 29-31*

The disclosure in *Hogan* of Element 1[A] also renders obvious dependent claims 2 and 29-31 for the reasons discussed in Section VI.B.2. Eldering, ¶¶94 (claim 31), 98 (claim 2), 99 (claims 29-30), 168-172.

2. *Dependent Claims 3, 4, and 5*

The disclosures in *Hogan* and *Walters* of Element 1[H2] also render obvious dependent claims 3, 4, and 5 for the reasons discussed in Section VI.B.10. Eldering, ¶¶152, 173-176.

3. *Dependent Claims 6 and 25*

The disclosure in *Hogan* of Element 1[B] also renders obvious dependent claims 6 and 25 for the reasons discussed in Section VI.B.3. Eldering, ¶¶102, 177-179.

4. *Dependent Claims 23 and 32*

The disclosures in *Hogan* and *Walters* of Element 1[D] also render obvious dependent claims 23 and 32 for the reasons discussed in Section VI.B.5. Eldering, ¶¶109, 113, 180-82.

5. *Dependent Claims 24, 34, 35, and 38*

The disclosures in *Hogan* and *Walters* of Element 1[G] also render obvious dependent claims 24, 34, 35, and 38 for the reasons discussed in Section VI.B.8. Eldering, ¶¶126 (claim 24), 127 (claim 35), 128 (claims 34 and 38), 183-187.

6. *Dependent Claim 33*

The disclosures in *Hogan* and *Walters* of Element 1[H1] also render obvious dependent claim 33 for the reasons discussed in Section VI.B.9. Eldering, ¶¶137, 188-189.

7. *Dependent Claims 36 and 37*

The disclosures in *Hogan* of Element 1[C] also render obvious dependent claims 36 and 37 for the reasons discussed in Section VI.B.4. Eldering, ¶¶106, 190-192.

VII. GROUND 2 – HOGAN, WALTERS, AND ABEL RENDER OBVIOUS CLAIMS 7, 9-12, 21, AND 26-28.

A. The Prior Art

1. *Abel (EX1004)*

Abel issued in November 1999, almost 18 years before the filing of the First Provisional (EX1007) that eventually led to the '417 Patent. *Abel*, Cover. *Abel* was disclosed during prosecution of the '417 Patent as one of 447 patents or published applications and 88 non-patent literature publications, but was not relied upon by the Examiner. '417 Patent, References Cited.

As its title (“Distribution Module For Optical Couplings”) suggests, *Abel* discloses a “distribution module for use in a traditional electrical panel that provides coupling functionality for optical and electrical connectors.” *Abel*, Abstract; Eldering, ¶195.

FIG. 2A shown below illustrates three “distribution modules 36a,b,c [that] are used with electrical panel 32 to provide high density, optical coupling functionality in a single module.” *Abel*, 4:2-6, FIG. 2A. Each distribution module has its own slack tray 40 that is “attached to the housing that spools and offers strain relief to the

buffered fiber, which is particularly vulnerable when stripped of its outer jacket”
“provid[ing] important protection for the fragile optical cable.” *Abel*, 2:23-25, 4:14-
25, 6:61-62, 8:57-59, FIG. 2A; *Eldering*, ¶196.

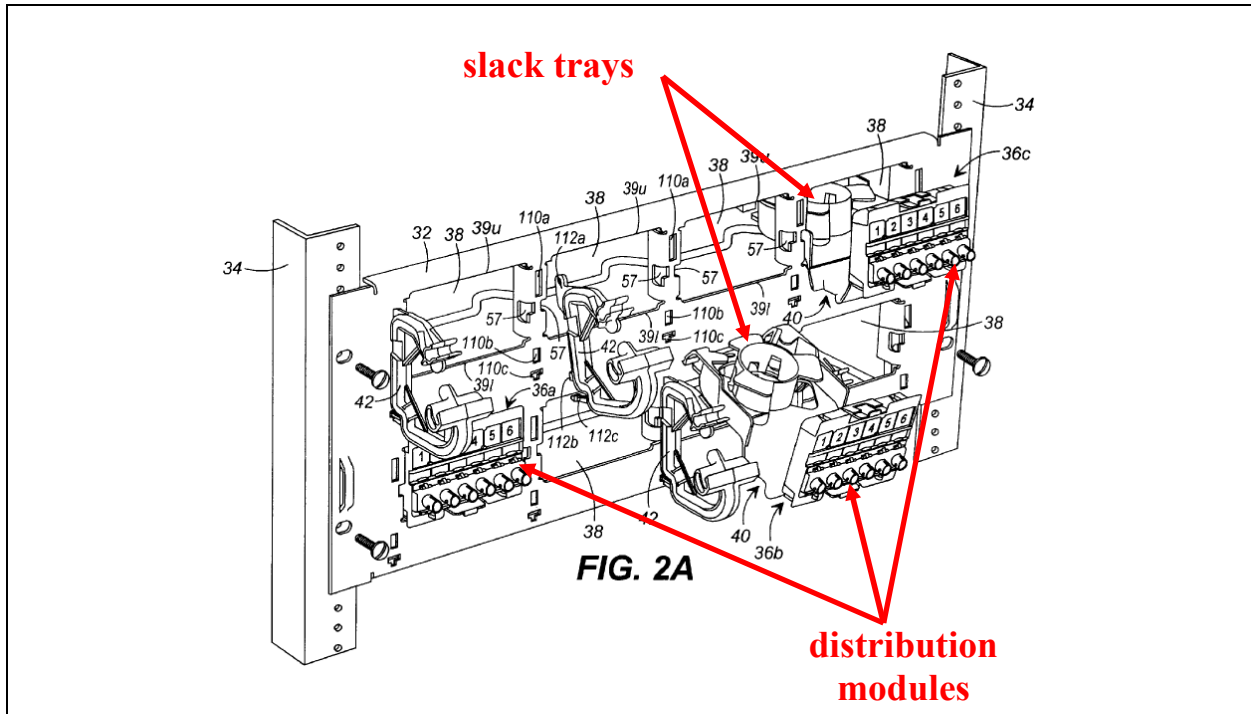
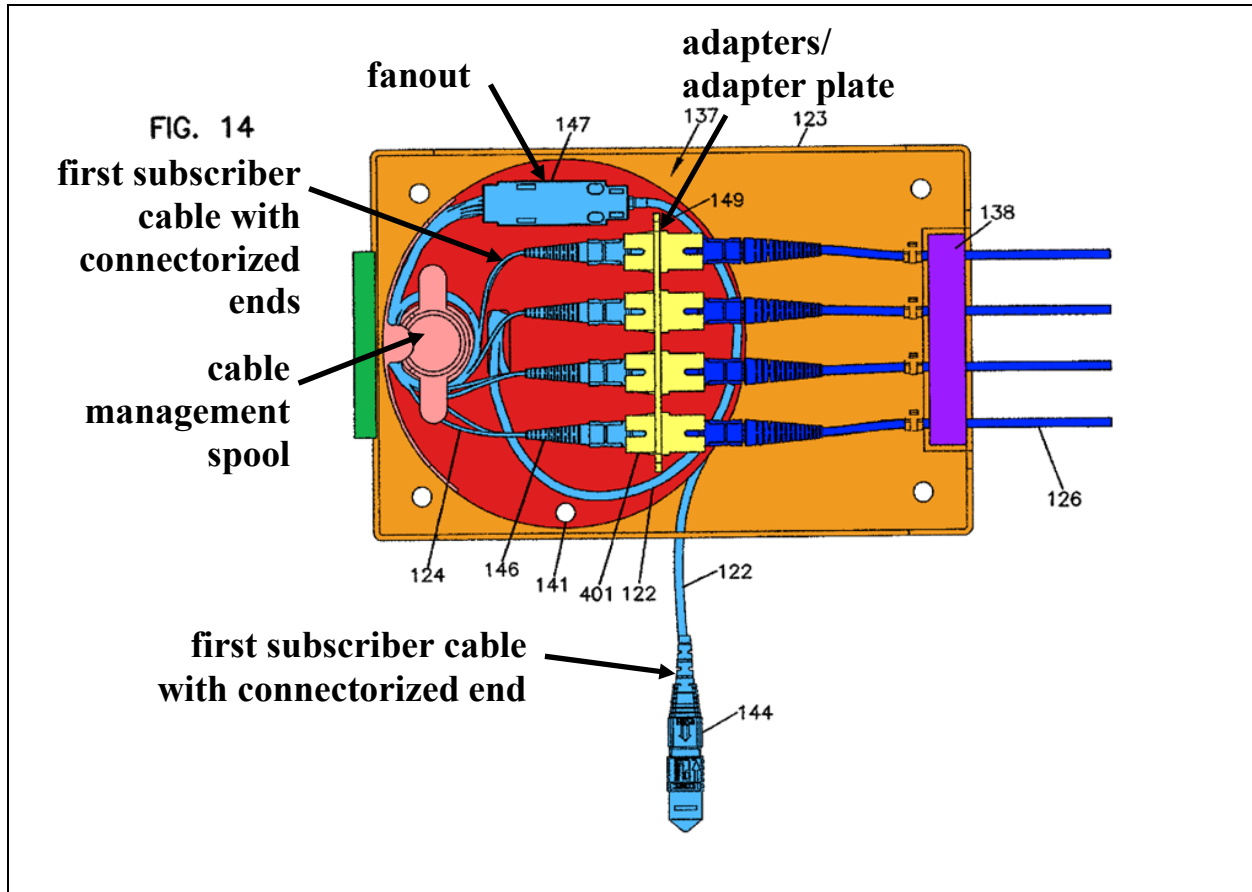
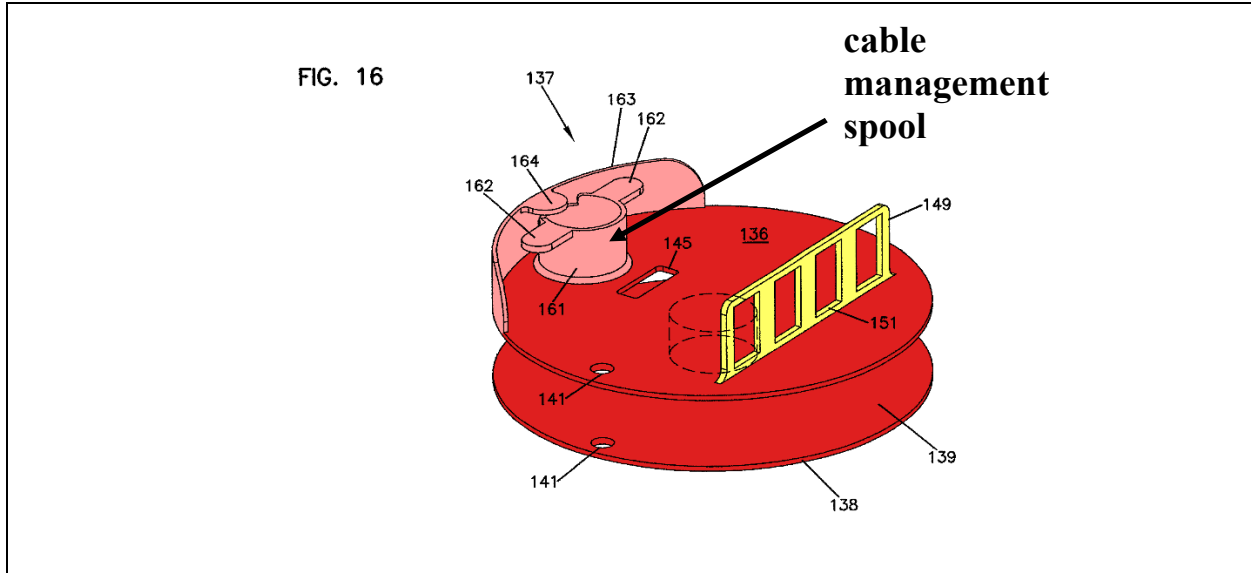


FIG. 8B shown below illustrates the different features of the slack tray 40 and includes a drum (spool) 96 for spooling the fibers 98 in a loop or coil, and side (guide) walls 99 for guiding and retaining the fiber 98, with the side walls and drum each including wings (fingers) 97 that guide the buffered fiber onto drum 96 and aid in retaining the buffered fiber on drum 96 once it is spooled. *Abel*, 3:24-28, 6:63-7:6, FIGS. 8A-8B; *Eldering*, ¶197.

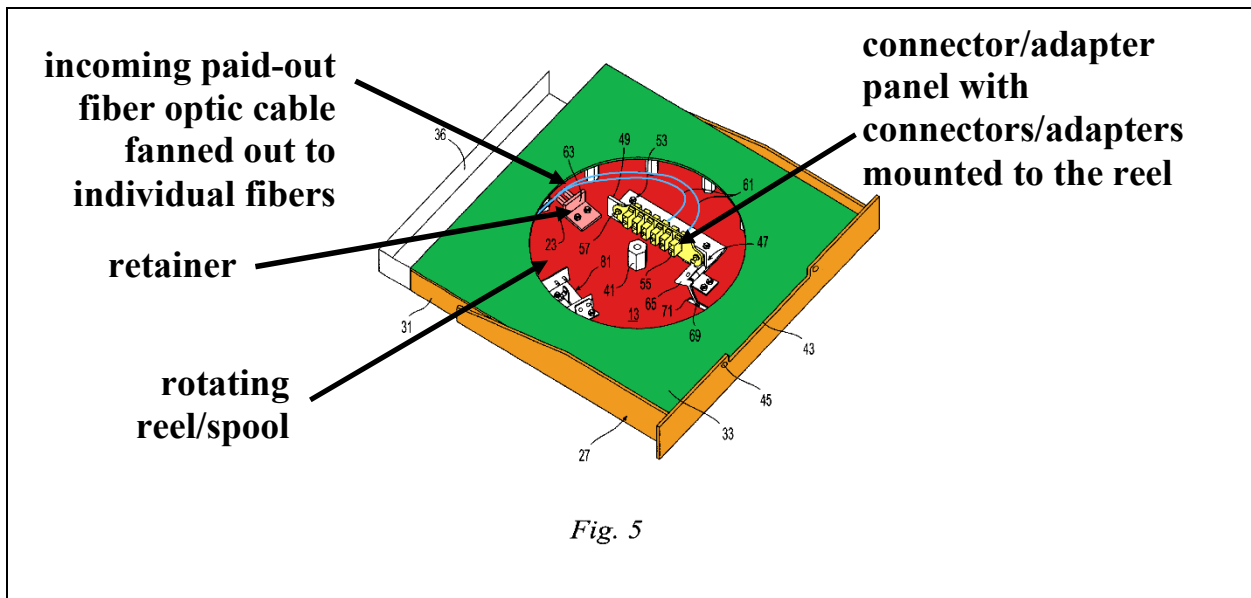
124” from the first subscriber cable 122 after they are broken out into individual fibers having connectorized ends 146 using a fanout 147. EX1001, 7:6-16, FIGS. 13-17; *see also id.*, 4:17-20, FIGS. 3-5. Eldering, ¶206.



The cable management spool 161 is sized such that its outer radius is larger than the minimum bend radius of the optical fibers so as to avoid signal attenuation and damage to the optical fibers during storage. EX1001, 4:20-24, FIGS. 3-5, 13-17; Eldering, ¶207.



To break out and secure individual fibers 61 from the paid-out fiber optic cable 23, *Walters* similarly discloses the use of a “fan out member (not shown)” that mounts to retainer 63 on the reel 11 and fans out the individual fibers 61 to the connector panel. *Walters*, 3:6-15, FIGS. 1, 5; *Eldering*, ¶208.



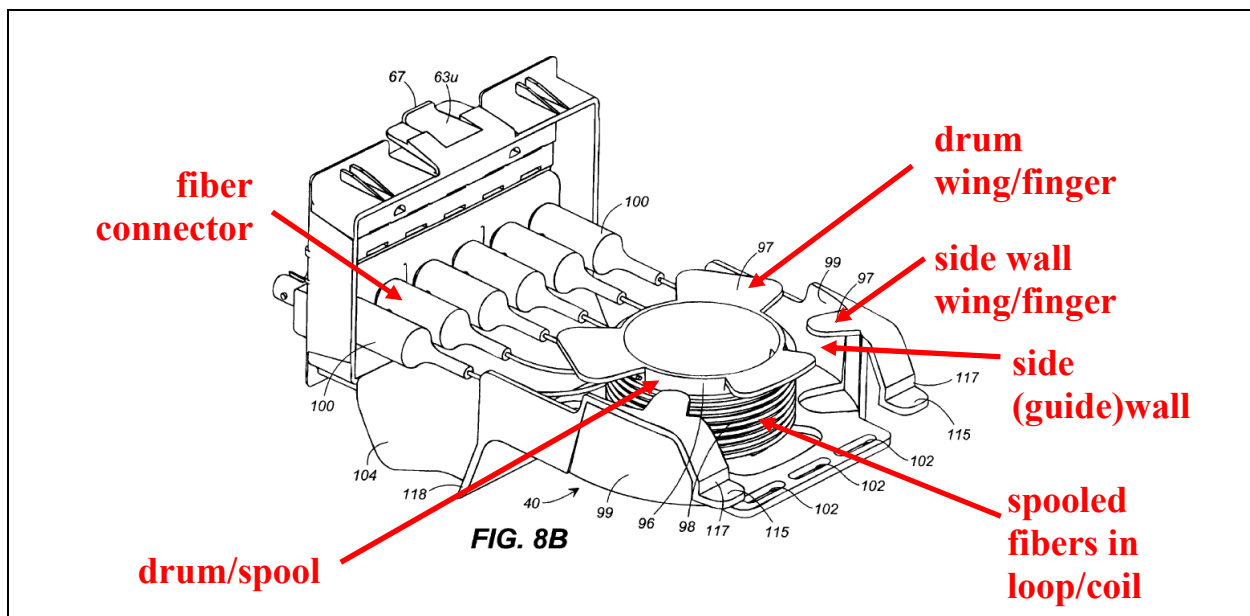
As can be seen in FIG. 5 above, because the individual fibers 61 (light blue)

are no longer “sheathed by an elastomeric jacket within cable 23” after they are “fanned out into individual coated lines from retainer 63 to connector panel 53,” *Walters* expressly warns that “[c]are must be taken to avoid excessive bending.” *Walters*, 3:13-16, FIG. 5; Eldering, ¶209.

Accordingly, *Walters* expressly identifies a need to “avoid excessive bending” of the individual fibers 61 no longer protected by an outer jacket to avoid damaging the fibers by violating the minimum bending radius of the fibers. Eldering, ¶210.

Abel (EX1004) identifies the same need and problem and provides a “slack tray” “that spools and offers strain relief to the buffered fiber, which is particularly vulnerable when stripped of its outer jacket,” using a “drum radius on which the fiber is spooled [] appropriately chosen to satisfy any minimum bend radius requirements of the fiber manufacturer.” *Abel*, 2:23-28, 4:14-25, 6:61-62 (“[S]lack tray 40 provides important protection for fragile optical cable.”), 7:27-32 (“As is known in the art, optical cable and buffered fiber cannot be bent at extreme angles as the protective sheathing and/or the fiber itself could be bent sufficiently to cause at least some of the light to escape the waveguide. Generally, cable and fiber manufacturers will specify the minimum bend radius for both jacketed and buffered fiber.”), 8:57-59 (“A slack tray can be used with the distribution module to protect the exposed, buffered fiber from potential damage.”), FIGS. 2A, 7A-8C. Eldering, ¶211.

FIG. 8B shown below illustrates the different features of *Abel's* slack tray 40 and includes a drum (spool) 96 for spooling the fibers 98 in a loop or coil, and side (guide) walls 99 for guiding and retaining the fiber 98, with the side walls and drum each including wings (fingers) 97 that guide the buffered fiber onto drum 96 and aid in retaining the buffered fiber on drum 96 once it is spooled. *Abel*, 3:24-28, 6:63-7:6, FIGS. 8A-8B; Eldering, ¶212.

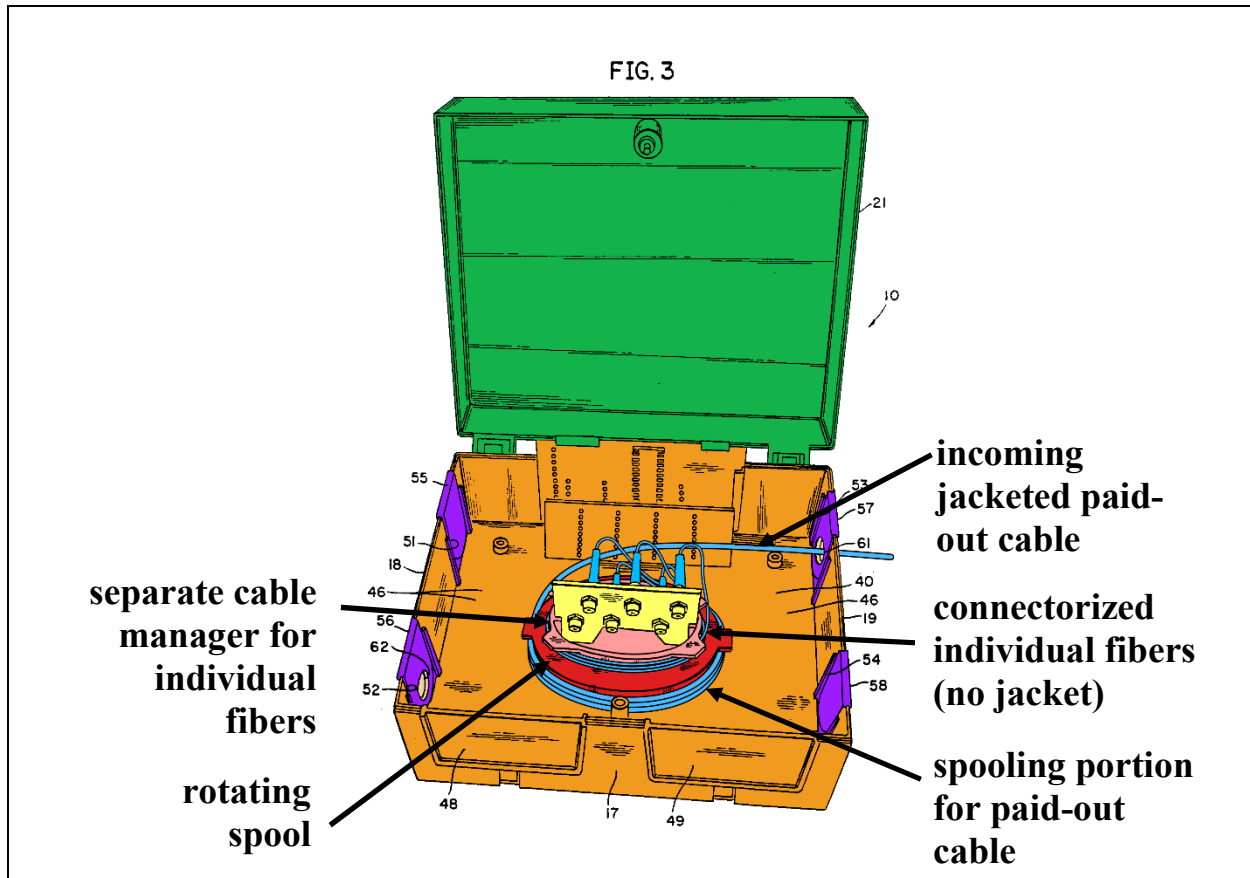


The connectors 100 at the ends of the fibers 98 are inserted onto the adapters as also shown in FIG. 8B. *Abel*, 7:6-8, FIGS. 8A-8B; Eldering, ¶213.

Accordingly, *Abel* discloses the “cable manager for storing slack cable within the enclosure arrangement” (slack tray 40 with a drum 96) for spooling the fibers 98 in a loop or coil) recited in dependent claim 7. *Abel's* slack tray 40 with a drum 96 stores the slack cable in substantially the same way (having the fiber wound around

the spool) to achieve substantially the same result (avoiding excessive bending and resulting signal attenuation or damage to the fiber) as the cable spools 61, 161 disclosed in the '417 Patent. This disclosure in *Abel* also discloses the elements of dependent claims 10 (“wherein the cable manager is configured for storing the slack cable in a loop”), 12 (“further comprising means for storing slack cable in a coil within the enclosure arrangement”), and 27 (“wherein the cable management structure is configured for storing slack length of the fiber optic cable in a coil”); Elderling, ¶214.

Claim 7 further requires that the cable manager be located “separate from the spooling portion of the spool.” A POSITA would have found it obvious based on the teachings of the slack tray 40 with drum 96 in *Abel* to modify the rotating spool (red) in the *Hogan/Walters* interconnect cabinet to include a cable manager (light red) for storing cable in a loop or a coil located separate from the spooling portion of the spool (red) as shown below. Elderling, ¶215.



As explained above, the '417 Patent, *Walters*, and *Abel* all describe a multi-fiber incoming paid-out cable that enters the enclosure with the fibers covered by a protective jacket, which is then broken out into individual fibers having connectorized ends where the individual fibers are no longer covered by the protective jacket. EX1001, 7:6-16, FIGS. 13-17; *see also id.*, 4:17-20, FIGS. 3-5; *Walters*, 3:6-15, FIGS. 1, 5; *Abel*, 2:23-28, FIGS. 8A, 8B; *Eldering*, ¶216.

Walters and *Abel*, which along with *Hogan* are all directed to storage and protection of fiber optic cable, teach that “care must be taken to avoid excessive bending” of these exposed fibers (*Walters*, 3:13-16, FIG. 5) that are “vulnerable”

and “fragile” such that a “drum radius on which the fiber is spooled is appropriately chosen to satisfy any minimum bend radius requirements of the fiber manufacturer” to protect the cable (*Abel*, 2:23-28, 6:61-62, 7:27-32, 8:57-59, FIGS. 8A-8B); Elderling, ¶217.

In addition to these prior art references, several other prior art references confirm that a POSITA would have been motivated to use a spool or drum to avoid excessive bending that would result in signal attenuation or damage to the optical fibers by using a spool with an appropriate bending radius. Elderling, ¶218-220.

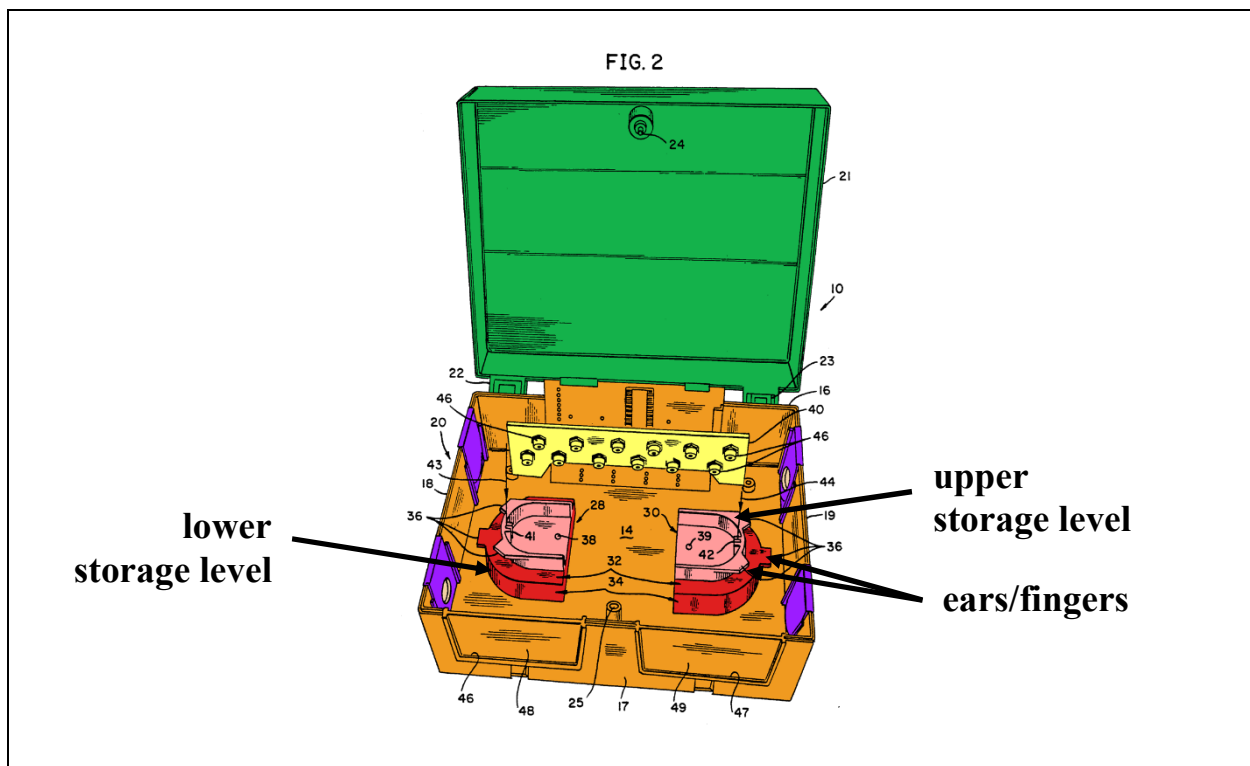
For example, *Kline* (EX1015), entitled “Fiber Optic Storing and Dispensing Apparatus,” explains in its Background that care must be taken to avoid bending a fiber optic cable more than the designed minimum bending radius of the cable to prevent physical damage and loss of signal transmissivity, especially when manually coiling and uncoiling fiber optic cable that may result in uncertain bending radii. *Kline*, [0004]-[0005], [0007]. To prevent damage to the cable during storage or dispensing, *Kline* teaches an apparatus with a rotating spool where “[n]o part of the cable within the casing is subject to being bent about a radius less than the minimum bending radius.” *Kline*, Abstract, [0009], [0024], [0026]-[0028], [0034], [0036], [0041]-[0042], FIGS. 1-9; Elderling, ¶219.

Similarly, *Kewitsch* (EX1016), entitled “Fiber Optic Rotary Coupling and Devices,” also explains in its Background that care must be taken in handling fiber

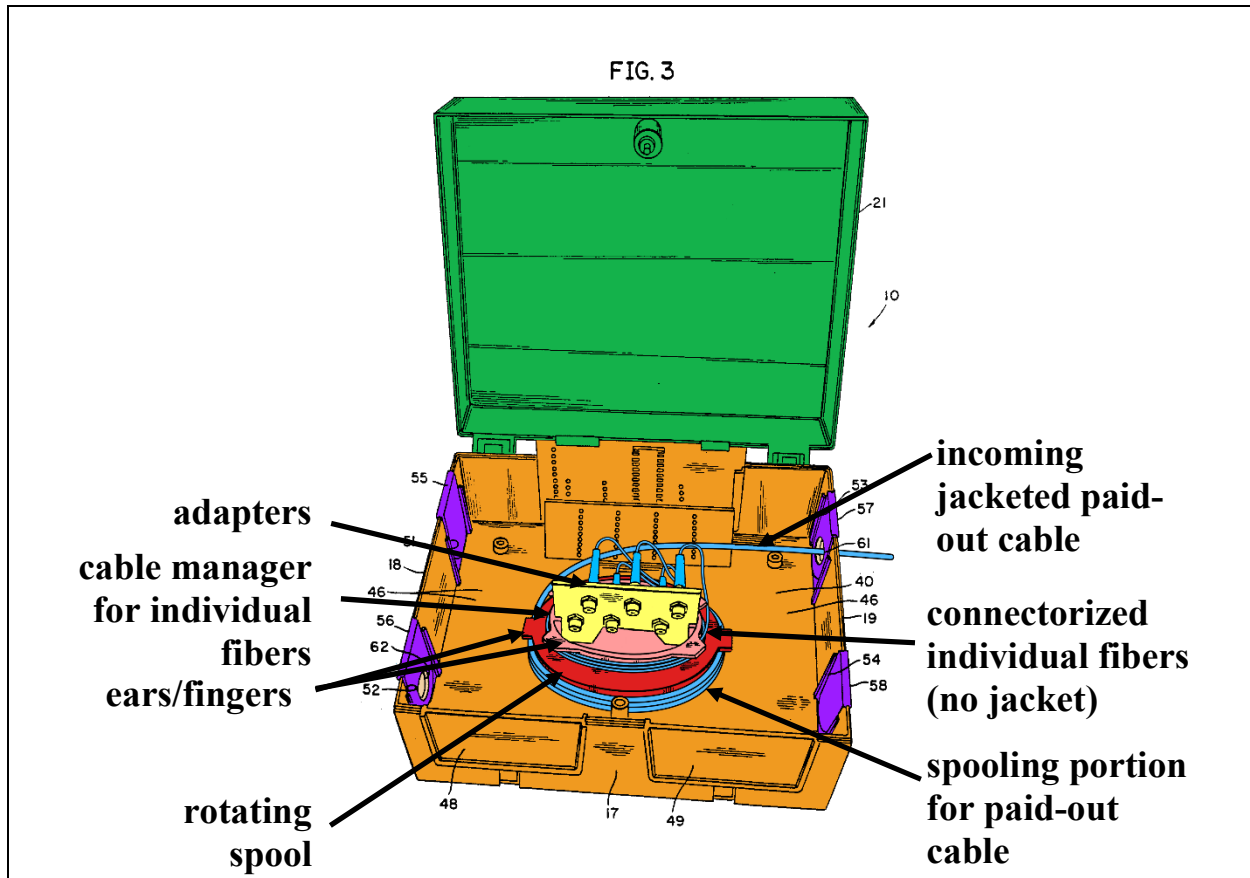
optic cables to avoid sharp bends that exceed the designed minimum bending radius of the cable to prevent physical damage, signal attenuation, etc. *Kewitsch*, 1:28-38. To prevent damage to the cable during storage or dispensing, *Kewitsch* teaches a “retraction unit [that] produces a negligible increase in insertion loss by utilizing a single, continuous cable wound in a spiral arrangement which maintains at least a minimum bend radius.” *Kewitsch*, 16:36-39; *see also id.*, 4:33-43, 7:43-46, 7:54-58, 8:46-49, 10:51-54, 11:13-17, FIGS. 1A-2B; *see also Noble* (EX1013) 1:5-8, 1:31-32, 2:58-62, 3:66-4:2, 5:22-26 (“[H]ousing 201 is so designed that the installer and the users cannot accidentally violate the bend radius of the optical fibers in routing them from the ports to the panel sections.”), FIGS. 1-4; *Bhatt* 2:24-34 (“a curvilinear shaped radius plate (to prevent sharp bends of optical fibers)”), 4:10-14, FIGS. 6-7; *Fritz* (EX1014) 1:9-12, 1:43-46, 1:51-56 (“Thus, providing immediate bend radius control to the fiber optic cables being terminated is a significant concern of installers.”), FIGS. 1-2, 5; *Eldering*, ¶220.

Accordingly, a POSITA would have been motivated based on the teachings of the slack tray 40 with drum 96 in *Abel* to modify the rotating spool in the *Hogan/Walters* interconnect cabinet to include a cable manager for storing cable in a loop or a coil located separate from the spooling portion of the spool to avoid excessive bending of the fibers by maintaining their minimum bend radius. *Eldering*, ¶221.

Returning to the original design in *Hogan*, the interconnect cabinet 10 already discloses two separate spooling sections as the excess lengths of incoming and outgoing optical fibers 12, 13 are wrapped around and stored on an upper storage level 32 (light red) and a lower storage level (34), both with ears/fingers 36 facilitating retention of the fibers. *Hogan*, Abstract, 1:61-2:3, 3:10-14, 3:14-27, 3:40-44, 4:3-9, FIGS. 2-4; Eldering, ¶222.



A POSITA seeking to modify *Hogan* to provide a rotating spool with a cable manager to protect the individual fibers would use the suitable bend radius of the upper storage level 32 (light red) to route the fibers to minimize the distance between the individual fibers and (i) the incoming jacketed paid-out cable and (ii) the adapters (yellow) to which the individual fibers connect. Eldering, ¶223.



A POSITA would also be motivated to employ *Abel's* drum (spool) 96 for spooling the fibers 98 in a loop or coil on the rotating spool, including the side (guide) walls 99 for guiding and retaining the fiber 98, with the side walls and drum each including wings (fingers) 97 that guide the buffered fiber onto drum 96 and aid in retaining the buffered fiber on drum 96 once it is spooled to avoid excessive bending of the fibers. *Abel*, 3:24-28, 6:63-7:6, FIGS. 8A-8B; *Eldering*, ¶224.

In both cases (*i.e.*, whether *Hogan's* upper storage level 32 (light red) or *Abel's* drum 96 was used), the cable manager would be mounted onto the rotating spool and rotate in unison with the spool when the cable is paid out to avoid straining

the fibers. This configuration would also teach the elements of dependent claim 26 (“wherein the cable spool carries a cable management structure so that the cable management structure rotates in unison with the cable spool when the cable spool rotates relative to the enclosure arrangement.”). Elderling, ¶225.

A POSITA would have had an expectation of success because the cable management structures described in both *Hogan* and *Abel* are designed to protect and organize fiber optic cable and to minimize excessive bending of the fiber optic cable. A POSITA would have recognized that the drum 96 in *Abel* or *Hogan*’s upper storage level 32 could be used in the same way in the *Hogan/Walters* interconnect cabinet to ensure bend-radius protection of the individual fibers just before they are routed to the adapters. Elderling, ¶226.

Incorporating *Abel*’s management drum or *Hogan*’s upper storage level 32 on the rotating spool is merely the application of a known technique (organizing optical fibers and protecting them from excessive bending) to a known device (cable storage apparatus of *Hogan/Walters* combination) ready for improvement to yield predictable results (protect fibers from excessive bending during storage and connection to the adapters). *KSR*, 550 U.S. at 421; Elderling, ¶227.

That the claimed cable manager disposed on a spool is obvious is supported by the prosecution of the European equivalent to the ’417 Patent. For example, the Examiner rejected a claim directed to a cable management spool as lacking an

inventive step finding that a “skilled person would think of a spool to store an overlength cable.” EX1010, 222, ¶3.7. In addition, the Patent Owner deleted the feature “a cable manager disposed on an axial end of the cable spool” from pending claim 1, admitting that “[t]his 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.” EX1010, 226, ¶1.1.2; Elderling, ¶228.

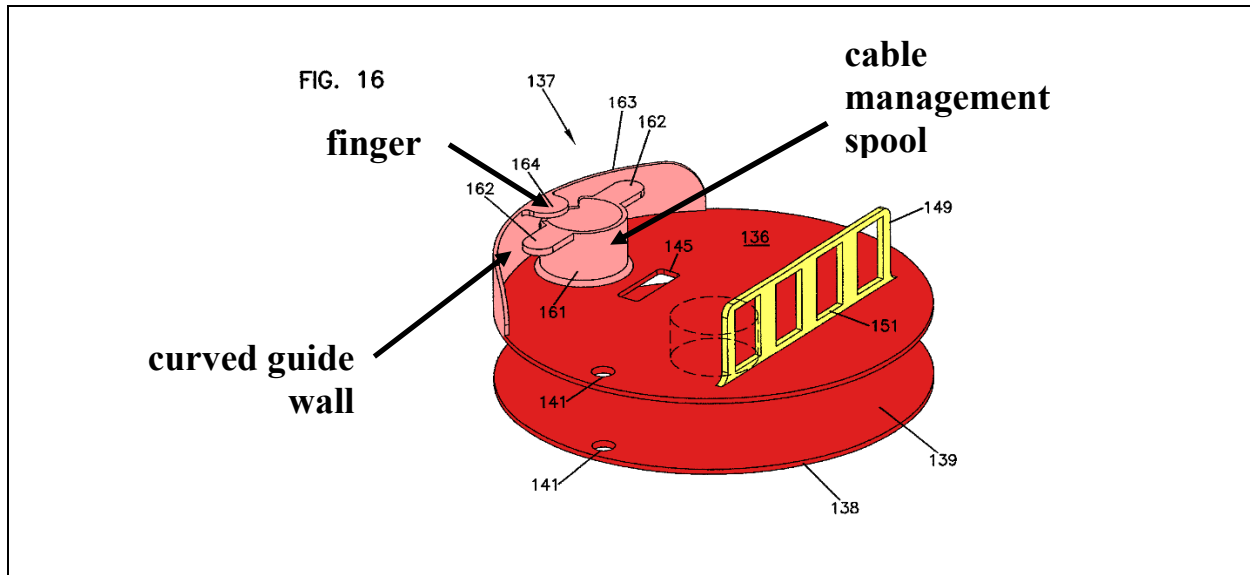
C. Dependent Claims 9, 11, 21, and 28 (Cable Manager with Curved Guide Surface and Retention Finger)

Hogan, Walters, and Abel render obvious dependent claims 9, 11, 21, and 28. Elderling, ¶¶229-239.

Several dependent claims require further details for the cable manager, including “a curved guide surface” (claim 9), “a slack storage spool which defines the curved guide surface” (claim 11), “a finger extends laterally from the curved guide surface to assist in retention of the slack cable” (claim 21), and “a curved guide wall” (claim 28).

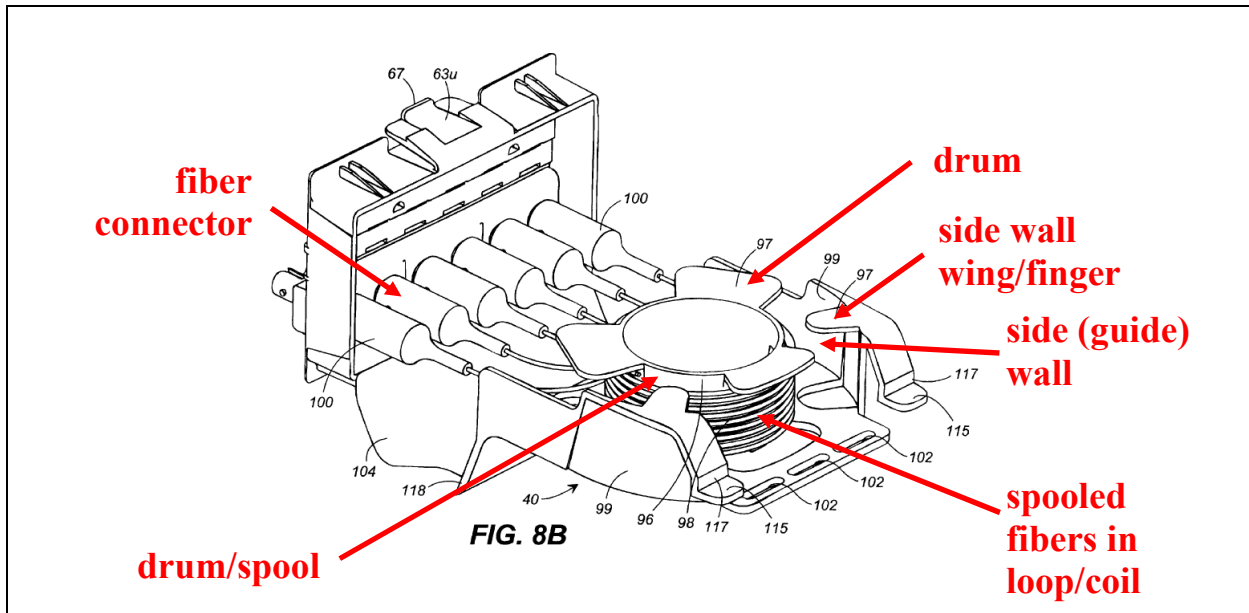
As shown in FIG. 16 below, the ’417 Patent discloses that “the cable management spool 161 includes a plurality of fingers 162 disposed on an end of the cable management spool 161” to “assist with cable retention. EX1001, 7:14-20, FIGS. 13-17; *see also id.*, 4:17-20, FIGS. 3-5. “[T]he cable spool 137 further includes an outer guide wall 163 disposed ... adjacent to the cable management

spool 16” EX1001, 7:21-27, FIGS. 13-17. “The outer guide wall 163 includes [] a cable finger 164 disposed at an end of the outer guide wall 163 that assists with retention and protection of the fibers 124.” EX1001, 7:28-32, FIGS. 13-17; Eldering, ¶235.



As will be explained, *Abel* discloses each of these additional requirements for the cable manager. Eldering, ¶¶236-239.

Abel's FIG. 8B shown below illustrates the different features of the slack tray 40 and includes a drum (spool) 96 for spooling the fibers 98 in a loop or coil, and side (guide) walls 99 for guiding and retaining the fiber 98, with the side walls and drum each including wings (fingers) 97 that guide the buffered fiber onto drum 96 and aid in retaining the buffered fiber on drum 96 once it is spooled. *Abel*, 3:24-28, 6:63-7:6, FIGS. 8A-8B; Eldering, ¶237.



Regarding dependent claims 9 (“a curved guide surface”) and 28 (“a curved guide wall”), the surfaces of the drum (spool) 96 and the side (guide) walls 99 are both curved and guide the fibers. Regarding claim 11, the drum (spool) 96 is “a slack storage spool which defines the curved guide surface.” Finally, the surfaces of both the drum (spool) 96 and the side (guide) walls 99 both include “a finger [wing 97 that] extends laterally from the curved guide surface to assist in retention of the slack cable” (claim 21). *Hogan* also discloses the use of ears 36 for facilitating retention of the fibers. *Hogan*, 3:21-25, FIGS. 2-4; *Eldering*, ¶238.

As discussed in the previous section (Section VII.B), a POSITA would have found it obvious and have a reasonable expectation of success based on the teachings of *Abel* to include these features in the cable manager used in the modified *Hogan/Walters* interconnect cabinet since, as disclosed in *Abel*, the features would

assist in guiding, spooling, retaining, and protecting the fibers from excessive bending of the fibers. *Abel*, 2:23-28, 4:14-25, 6:61-7:6, 7:27-32, 8:57-59, FIGS. 2A, 7A-8C; *Eldering*, ¶¶214-228, 239.

VIII. MANDATORY NOTICES

A. Real Parties-in-Interest

Belden Inc., PPC Broadband, Inc., and Opterna AM, Inc. are the real parties-in-interest. Other real parties-in-interest include Opterna International Corp. and Belden Worldwide Corp.

B. Related Matters

The '417 Patent was asserted against Petitioners in a complaint in *CommScope Technologies LLC v. Belden Inc. et al*, C.A. No. 24-440-RGA (D. Del.) served June 10, 2024.

C. Lead and Back-Up Counsel

Lead Counsel	Back-up Counsel
Denis J. Sullivan (Reg. No. 47,980) BARCLAY DAMON, LLP Barclay Damon Tower 125 East Jefferson St. Syracuse, NY 13202 Direct Tel.: 315-425-2868 Email: dsullivan@barclaydamon.com	Cory C. Bell (Reg. No. 75,096) FINNEGAN, HENDERSON, FARABOW, GARRETT, & DUNNER LLP 2 Seaport Lane, 6th Floor Boston, MA 02210-2001 Direct Tel.: 617-646-1641 Email: cory.bell@finnegan.com

D. Service Information

Please address correspondence and service to all counsel listed above.

Petitioner consents to service by e mail at the addresses listed above.

The Patent Trial and Appeal Board is hereby authorized to charge any fees associated with this proceeding to deposit Account No. 50-3010.

IX. STANDING

The '417 Patent is eligible for inter partes review, and Petitioners are not barred or estopped from requesting review.

X. CONCLUSION

Petitioners have established a reasonable likelihood of success and request institution and cancellation of the Challenged Claims.

XI. CLAIMS LISTING APPENDIX

U.S. Patent No. 10,996,417
Challenged Claims 1-7, 9-12, and 21-38

Designation	Claim Elements
Independent Claim 1 Element 1[preamble]	A fiber optic enclosure comprising:
Independent Claim 1 Element 1[A]	a wall mountable enclosure arrangement including a base, sidewalls that project forwardly from the base, and a cover, front portions of the sidewalls defining a front access opening, the cover being pivotal relative to the base about a pivot axis between an open position providing access to the front access opening and a closed position covering the front access opening, the cover contacting the front portions of the sidewalls when disposed in the closed position;
Independent Claim 1 Element 1[B]	the enclosure arrangement defining a first cable opening for routing a first cable into the enclosure arrangement;
Independent Claim 1 Element 1[C]	at least one of the side walls defining a second cable opening;
Independent Claim 1 Element 1[D]	a spool mountable to the enclosure arrangement and positionable within the enclosure arrangement, the spool defining a spooling portion;
Independent Claim 1 Element 1[E]	a second fiber optic cable spooled about the spooling portion of the spool, the second fiber optic cable including at least one optical fiber;
Independent Claim 1 Element 1[F]	a fiber optic connector coupled to the at least one optical fiber of the second fiber optic cable;
Independent Claim 1 Element 1[G]	a fiber optic adapter spaced inwardly from the sidewalls, the fiber optic adapter including a first connector port for receiving the fiber optic connector and also including an opposite second connector port;

Designation	Claim Elements
Independent Claim 1 Element 1[H1]	the second fiber optic cable being payable from the spool through the second cable opening while the spool is mounted to the enclosure arrangement, wherein the spool rotates relative to the enclosure arrangement about an axis of rotation as the second fiber optic cable is paid out from the spool, and
Independent Claim 1 Element 1[H2]	wherein the fiber optic connector rotates in concert with the spool as the second fiber optic cable is paid out from the spool;
Independent Claim 1 Element 1[I]	and wherein access for plugging a connectorized end of the first cable into the second connector port of the fiber optic adapter while the fiber optic adapter is spaced inwardly from the sidewalls is: a) available from the front of the enclosure arrangement when the cover is in the open position; and b) not available from the front of the enclosure arrangement when the cover is in the closed position.
Dependent Claim 2	The fiber optic enclosure of claim 1, further comprising a hinge for allowing the cover to pivot between the open and closed positions.
Dependent Claim 3	The fiber optic enclosure of claim 1, wherein the fiber optic connector is supported on the spool when the fiber optic cable is paid out from the spool.
Dependent Claim 4	The fiber optic enclosure of claim 1, wherein the fiber optic adapter is coupled to the fiber optic connector, and wherein the fiber optic adapter rotates in concert with the spool as the fiber optic cable is paid out from the spool.
Dependent Claim 5	The fiber optic enclosure of claim 1, wherein the fiber optic cable includes a plurality of optical fibers, wherein a plurality of fiber optic connectors terminate the plurality of optical fibers at the first end of the fiber optic cable, wherein the fiber optic connectors rotate in concert with the spool as the fiber optic cable is paid out from the spool, wherein the telecommunications enclosure further includes a plurality of fiber optic adapters, wherein the plurality of fiber optic connectors are secured within the plurality of fiber optic adapters when the fiber optic cable is paid out from the spool.

Designation	Claim Elements
Dependent Claim 6	The fiber optic enclosure of claim 1, wherein a cable seal is provided at the first cable opening.
Dependent Claim 7	The fiber optic enclosure of claim 1, further comprising a cable manager for storing slack cable within the enclosure arrangement at a location separate from the spooling portion of the spool.
Dependent Claim 9	The fiber optic enclosure of claim 7, wherein the cable manager includes a curved guide surface.
Dependent Claim 10	The fiber optic enclosure of claim 9, wherein the cable manager is configured for storing the slack cable in a loop.
Dependent Claim 11	The fiber optic enclosure of claim 9, wherein the cable manager includes a slack storage spool which defines the curved guide surface.
Dependent Claim 12	The fiber optic enclosure of claim 1, further comprising means for storing slack cable in a coil within the enclosure arrangement.
Dependent Claim 21	The fiber optic enclosure of claim 9, wherein a finger extends laterally from the curved guide surface to assist in retention of the slack cable.
Independent Claim 22 - [Preamble]	A fiber optic enclosure comprising:

Designation	Claim Elements
Independent Claim 22 Element 22[A]	a wall mountable enclosure arrangement including a base, sidewalls that project forwardly from the base, and a cover, front portions of the sidewalls defining a front access opening, the enclosure arrangement defining a cable opening, the cover being pivotal relative to the base about a pivot axis between a closed position covering the front access opening and an open position providing access to the front access opening, the cover contacting the front portions of the sidewalls when disposed in the closed position;
Independent Claim 22 Element 22[B]	a cable spool mounted to the enclosure arrangement so that the cable spool is rotatable relative to the enclosure arrangement about a rotation axis that is transverse to the pivot axis, the cable spool including a spooling portion;
Independent Claim 22 Element 22[C]	a fiber optic cable spooled about the spooling portion of the cable spool, the fiber optic cable including at least one optical fiber;
Independent Claim 22 Element 22[D]	a fiber optic connector terminating the at least one optical fiber of the fiber optic cable, the fiber optic connector rotating in unison with the cable spool when the cable spool rotates about the rotation axis;
Independent Claim 22 Element 22[E]	and a fiber optic adapter mounted to the enclosure arrangement, the fiber optic adapter including a first connector port for receiving the fiber optic connector and also including an opposite second connector port;
Independent Claim 22 Element 22[F]	the cover extending across the fiber optic adapter when disposed in the closed position.
Dependent Claim 23	The fiber optic enclosure of claim 22, wherein the cable spool is disposed between the base and the cover when the cover is in the closed position.
Dependent Claim 24	The fiber optic enclosure of claim 22, wherein the sidewalls are devoid of openings suitable for mounting the fiber optic adapter.
Dependent Claim 25	The fiber optic enclosure of claim 22, wherein a cable seal is disposed at the cable opening for enabling a cable to be routed into the enclosure arrangement.

Designation	Claim Elements
Dependent Claim 26	The fiber optic enclosure of claim 22, wherein the cable spool carries a cable management structure so that the cable management structure rotates in unison with the cable spool when the cable spool rotates relative to the enclosure arrangement.
Dependent Claim 27	The fiber optic enclosure of claim 26, wherein the cable management structure is configured for storing slack length of the fiber optic cable in a coil.
Dependent Claim 28	The fiber optic enclosure of claim 26, wherein the cable management structure includes a curved guide wall.
Dependent Claim 29	The fiber optic enclosure of claim 22, wherein a hinge is coupled to one of the sidewalls and to the cover to define the pivot axis.
Dependent Claim 30	The fiber optic enclosure of claim 29, wherein the hinge is located at a first side of the enclosure arrangement, wherein the cable opening is defined at a second side of the enclosure arrangement, and wherein a corner is defined between the first side of the enclosure arrangement and the second side of the enclosure arrangement.
Dependent Claim 31	The fiber optic enclosure of claim 22, wherein the base defines a plurality of rear fastener openings for use in securing the enclosure arrangement at an installation surface.
Dependent Claim 32	The fiber optic enclosure of claim 22, wherein the base and the sidewalls at least partially surround the cable spool.
Dependent Claim 33	The fiber optic enclosure of claim 22, wherein the cable spool is mounted to the base so that the rotation axis extends through the access opening and intersects the cover when the cover is disposed in the closed position.
Dependent Claim 34	The fiber optic enclosure of claim 1, further comprising a cable routing path for routing the first cable to the second connector port of the fiber optic adapter, the cable routing path extending within the enclosure arrangement from the first cable opening to the second connector port of the fiber optic adapter.

Designation	Claim Elements
Dependent Claim 35	The fiber optic enclosure of claim 34, wherein the fiber optic adapter is located adjacent an axial end of the spool when the cover is in the closed position and the connectorized end is plugged into the second connector port.
Dependent Claim 36	The fiber optic enclosure of claim 1, wherein the second cable opening is separate from the front access opening.
Dependent Claim 37	The fiber optic enclosure of claim 1, wherein the first and second cable openings are separate from one another, and wherein the first cable opening is defined at least in part by one of the side walls.
Dependent Claim 38	The fiber optic enclosure of claim 22, further comprising a cable routing path for routing the first cable to the second connector port of the fiber optic adapter, the cable routing path extending within the enclosure arrangement from the first cable opening to the second connector port of the fiber optic adapter.

Date: June 10, 2025

Respectfully submitted,

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CERTIFICATION UNDER 37 C.F.R. § 42.24(d)

Pursuant to 37 C.F.R. § 42.24(a)(1)(i), the undersigned hereby certifies that the foregoing **PETITION FOR *INTER PARTES* REVIEW** contains 13,991 words, excluding the parts of this Petition that are exempted under 37 C.F.R. § 42.24(a), as measured by the word-processing system used to prepare this paper.

/Denis J. Sullivan /
Denis J. Sullivan (Reg. No. 47,980)
Lead Counsel

CERTIFICATE OF SERVICE

The undersigned certifies that, in accordance with 37 C.F.R. §§ 42.6(e) and 42.105(a), the **PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 10,996,417**, the associated Power of Attorney, and Exhibits 1001-1021 were served via Priority Mail Express through the United States Postal Service on June 10, 2025, on the correspondence address of record below indicated in the U.S. Patent Office's Patent Center for U.S. Patent No. 10,996,417:

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Courtesy copies were concurrently served on June 10, 2025 (i) electronically and (ii) by UPS Overnight delivery to the email and office addresses of Patent Owner's USPTO counsel of record and litigation counsel:

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IPR2025-01119
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