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Paper 23
Date: February 19, 2025

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AMPHENOL CORP.,
Petitioner,

v.

PPC BROADBAND, INC.,
Patent Owner.

IPR2023-01363
Patent 9,008,483 B2

Before BART A. GERSTENBLITH, GEORGE R. HOSKINS, and JON B. TORNQUIST, *Administrative Patent Judges*.

TORNQUIST, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Amphenol Corp. ("Petitioner") filed a Petition requesting *inter partes* review of claims 1, 2, and 10–13 ("Challenged Claims") of U.S. Patent No. 9,008,483 B2 (Ex. 1001, "the '483 patent"). Paper 2 ("Pet."). PPC Broadband, Inc. ("Patent Owner") filed a Preliminary Response to the Petition. Paper 6. We instituted review with respect to all grounds and claims set forth in the Petition. Paper 9 ("Institution Decision" or "Inst. Dec."). After institution, Patent Owner filed a Response (Paper 13, "PO Resp."), to which Petitioner filed a Reply (Paper 15, "Pet. Reply"), and Patent Owner filed a Sur-reply (Paper 17, "Sur-reply").

Petitioner relies, *inter alia*, upon two declarations from Sayfe Kiaei, Ph.D. (Ex. 1003 (original declaration); Ex. 1033 (supplemental declaration)), and Patent Owner relies upon two declarations from Charles A. Eldering, Ph.D. (Ex. 2001 (original declaration, ¶¶ 1–91); Ex. 2007 (response declaration, ¶¶ 92–259)).

An oral hearing was held on December 16, 2024, and a transcript of the hearing is included in the record (Paper 22, "Tr.").

For the reasons that follow, we conclude that Petitioner demonstrates by a preponderance of the evidence that all of the challenged claims of the '483 patent are unpatentable.

II. BACKGROUND

A. Related Matter

The parties identify *PPC Broadband, Inc. v. Charles Industries, LLC*, 1-22-cv-01517-GBW (D. Del.), as a related matter. Pet. 91; Paper 4, 2.

B. Real Parties-in-Interest

Petitioner identifies itself and Charles Industries, LLC, as the real parties-in-interest. Pet. 91. Patent Owner identifies itself and Belden Inc., as the real parties-in-interest. Paper 4 (Patent Owner's Mandatory Notices), 2.

C. The '483 patent

The '483 patent is titled "Optical Fiber Cable Drop Interface Box" and issued April 14, 2015. Ex. 1001, codes (45), (54). The '483 patent discloses an enclosure for distribution of a passive optical fiber network. *Id.* at 1:19–21. The '483 patent explains that typically a feed or drop optical fiber cable is provided from an optical fiber service provider to a premises, such as a multi-unit dwelling. *Id.* at 1:15–18, 1:39–44. This drop cable is "typically a heavy jacketed or hardened multi-fiber cable that is broken out at the premises into individual fiber connections." *Id.* at 1:42–44.

The '483 patent explains that optical fiber cables are often pre-connectorized, i.e., "shipped from a factory with terminating connectors already installed," which "can lead to the need for installers to deal with excess optical fiber cable length in many instances." Ex. 1001, 1:50–54. "Storage of the excess cable length can be problematic, as can organization of the drop optical fiber cable, the multiple individual feed optical fiber cables, and the multiple individual distribution optical fiber cables." *Id.* at 1:55–59. To overcome these challenges, the '483 patent discloses "a drop interface box (DIB) for interfacing between an optical network service provider's heavy jacketed drop cable and optical distribution cables at a premises." *Id.* at 2:3–6. "The DIB provides organized drop, feed and distribution fiber cable storage and routing in a manner which does not cross

different cable types when additional cables are added, and which maintains minimum bend radius of the cables and inhibits cable strain." *Id.* at 2:6–10.

Figure 5-2 is reproduced below.

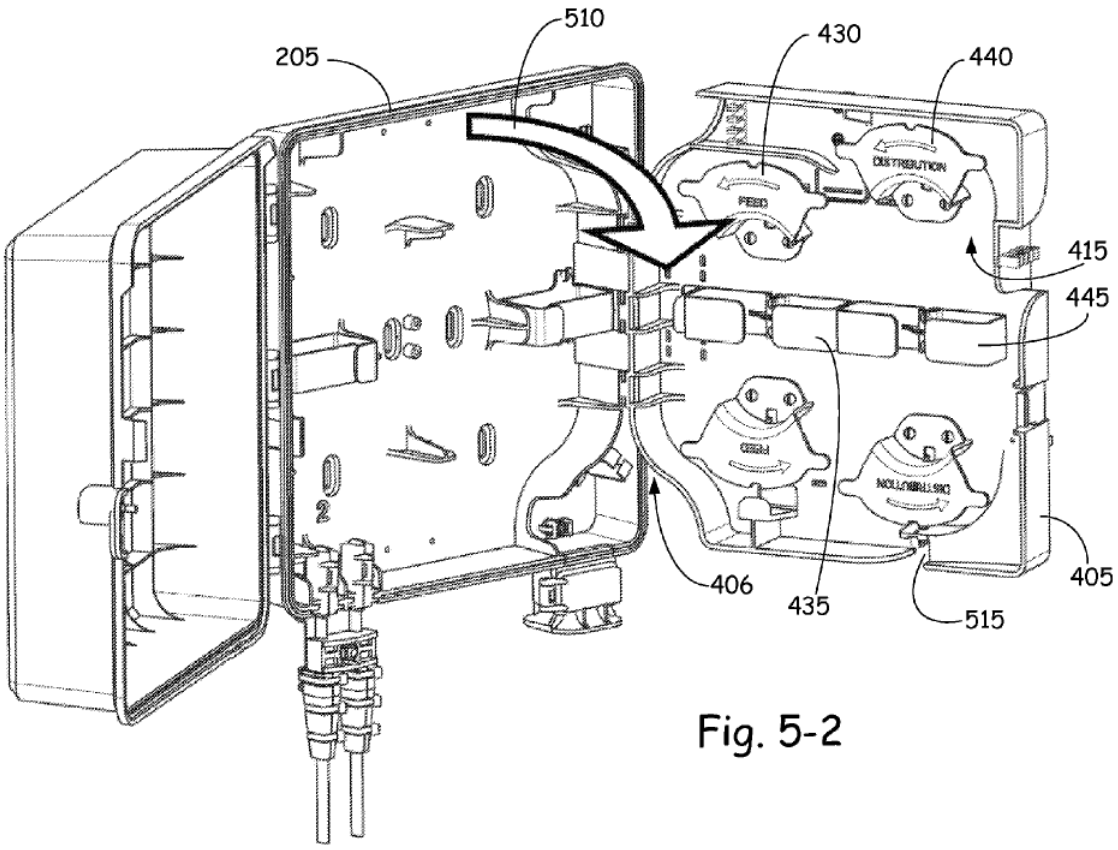


Fig. 5-2

Figure 5-2 is a diagrammatic illustration of the drop, feed, and distribution cable routing and storage in a DIB embodiment. Ex. 1001, 2:36–38. As shown in Figure 5-2, base 205 includes drop cable storage clips that are used to retain coils of the outdoor jacketed feeder cable without imparting unnecessary stress on the cable or violating minimum bend radius. *Id.* at 4:58–62, 5:21–26. Arrow 510 represents the routing of drop cable 110 (depicted in Figure 5-4 below) from base 205 to rear side 415 of hinged fiber storage panel 405. *Id.* at 5:30–32. Cable storage spools 430 and 440, cable storage clips 435 and 445, and routing channels 515 and 532 (shown in Figure 5-4 below) of storage panel 405 "are positioned and designed to

(1) maintain separation of cable storage between the feed cables (stored on spools 430 and clips 435) and the distribution cables 120 (stored on spools 440 and clips 445); (2) support the manufacturer's specific minimum bend radius for the cables; and (3) allow cables to be added after the initial installation without cross-over of cable types." *Id.* at 5:34–43.

Figure 5-4 is reproduced below.

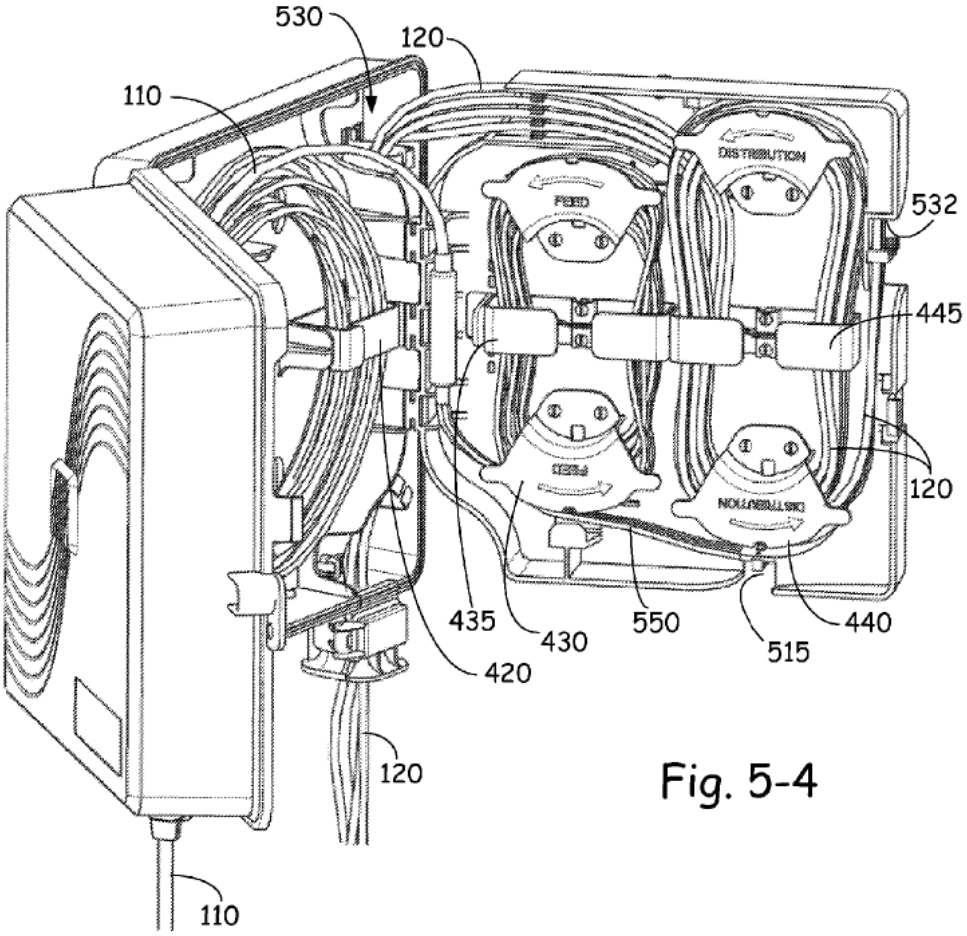


Fig. 5-4

Figure 5-4 is a view of an exemplary DIB 100 "with drop cable 110, feed cables 550 and distribution cables 120 routed and stored." Ex. 1001, 2:39–41, 6:19–21. After the cables are routed and stored in fiber storage panel 405, the panel is folded over to lie against base 205, and then a cover (at left in Figure 5-4) is folded over to close the DIB. *See id.* at 3:35–49,

4:49–53, 6:22–24.

Figure 6-4 is reproduced below.

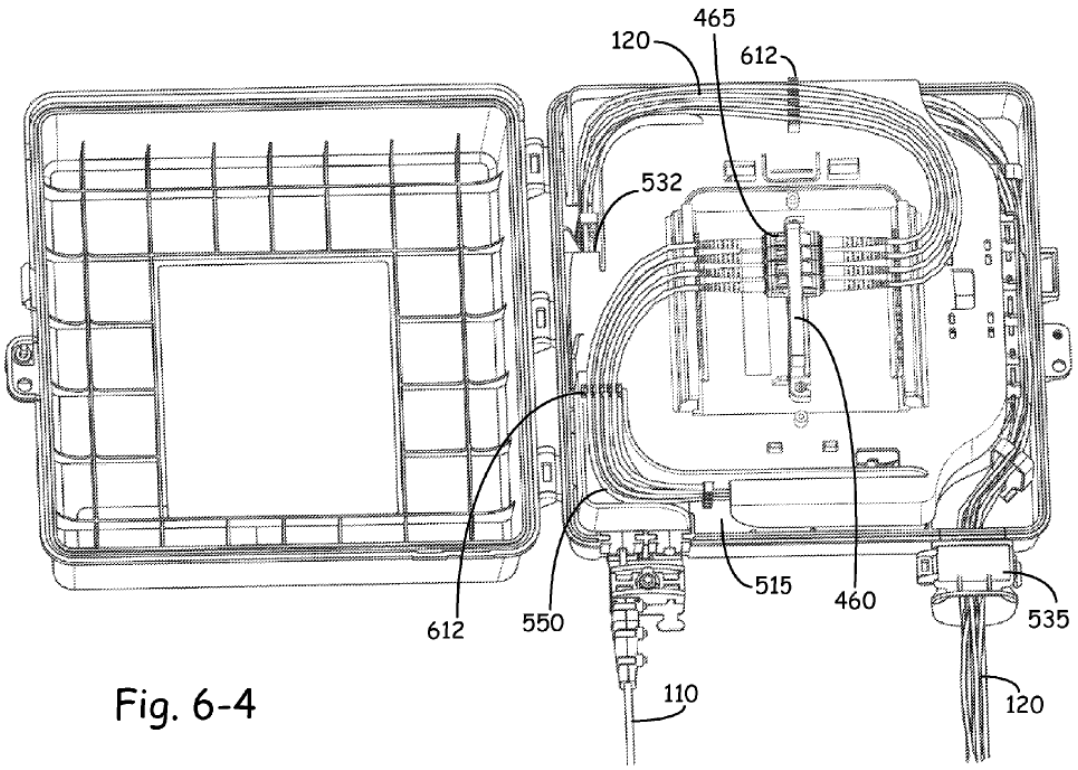


Fig. 6-4

Figure 6-4 is a view of an exemplary DIB showing feed and distribution cable routing to the front side of the fiber storage panel. Ex. 1001, 2:48–51. In Figure 6-4,

> DIB 100 is shown in its folded position (with front 410 of panel 405 shown facing out as the panel is stored in the base) with drop cable 110, feed cables 550 and distribution cables 120 routed and stored as described above, including the transition channels 515 and 532 as well as the cable adapters or connectors 465 positioned approximately at the center of panel 405.

Id. at 7:1–7. "On the front side 410 of hinged fiber storage panel 405 is an adapter bracket 460 which holds one or more connectors or adapters 465." *Id.* at 5:3–5. "Adapters 465 convert between the feed cables 550 and the distribution cables 120" and are "standard components used in the

telecommunications industry for converting optical fiber signals between feed cables and distribution cables." *Id.* at 5:5–10.

D. Illustrative Claim

Claim 1, reproduced below, is representative of the Challenged Claims.

> 1. [pre] A drop interface box configured to be mounted to a structure and to receive a drop cable from an optical fiber service provider distribution point and a plurality of distribution cables which distribute the optical fiber service, the drop interface box comprising:
>
> > [1a] a base unit having a drop cable entrance configured to receive the drop cable and having drop cable retaining mechanisms spaced apart and configured to retain a length of drop cable looped around the drop cable retaining mechanisms;
> >
> > [1b] a cover having a hinged connection to the base unit to selectively enclose a storage area provided in the base unit; and
> >
> > [1c] a fiber storage panel having a hinged connection to the base unit on a side opposite the hinged connection of the cover to the base unit such that the fiber storage panel is moveable relative to the base unit and configured to be stored between the base unit and the cover,
> >
> > [1d] the fiber storage panel having first spools positioned to store a plurality of feed break-out cables coupleable to the drop cable, the fiber storage panel further having second spools positioned to store a plurality of distribution cables coupleable to the plurality of feed break-out cables.

Ex. 1001, 7:23–46 (Petitioner's spacing and bracketing added for reference); Pet. 93–94 (Claims Listing Appendix).

E. Asserted Grounds of Unpatentability

Petitioner asserts that claims 1, 2, and 10–13 of the '483 patent are unpatentable on the following grounds (Pet. 8):

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1, 11	103(a)	Holmberg[1], Battey[2]
2, 12, 13	103(a)	Holmberg, Battey, Blankenship[3]
1, 2, 11–13	103(a)	Holmberg, Battey, Blankenship
10	103(a)	Holmberg, Battey, Cowen[4]
10	103(a)	Holmberg, Battey, Blankenship, Cowen

III. ANALYSIS

A. Legal Standard

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and "the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective

[1] U.S. Patent Publ. 2009/0202214 A1, published August 13, 2009. Ex. 1004 ("Holmberg").

[2] U.S. Patent Publ. 2008/0112681 A1, published May 15, 2008. Ex. 1005 ("Battey").

[3] US 6,721,484 B1, issued April 13, 2004. Ex. 1006 ("Blankenship").

[4] US 8,965,168 B2, issued February 24, 2015. Ex. 1007 ("Cowen").

evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. Level of Ordinary Skill in the Art

In order to determine whether an invention would have been obvious at the time the application was filed, we consider the level of ordinary skill in the pertinent art. *Graham*, 383 U.S. at 17. In assessing the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quoting *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986)).

Petitioner contends a person of ordinary skill in the art "would have had at least a bachelor's degree in electrical engineering, computer engineering, or a related field, and at least 1 year of experience related to communication networks or the equivalent." Pet. 7. Petitioner further contends that "[a]dditional education could substitute for professional experience or significant experience in the field could substitute for formal education." *Id.* at 7–8 (citing Ex. 1003 ¶¶ 29–31).

Dr. Eldering agrees that one of ordinary skill in the art "would have had at least a bachelor's degree in electrical engineering, computer engineering, or a related field, and at least one year of experience related to communication networks or the equivalent." Ex. 2001 ¶ 24. According to Dr. Eldering, "[a] person with less relevant practical experience but with additional experience would also qualify." *Id.* Patent Owner contends that

any differences between the parties' proposed definitions "are insubstantial and do not impact the analysis of the issues presented." PO Resp. 20 n.3 (citing Ex. 2001 ¶¶ 19–26).

Upon review of the prior art of record and the parties' arguments, we adopt Petitioner's definition of the person of ordinary skill in the art for as it is consistent with the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (holding that the prior art itself can reflect the appropriate level of ordinary skill in the art). We note, however, that our conclusions in this proceeding would be the same under either party's definition, to the extent there is any relevant distinction between the two definitions.

C. Claim Construction

In an *inter partes* review proceeding, a patent claim is construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b). 37 C.F.R. § 42.100(b) (as amended Oct. 11, 2018). This rule adopts the same claim construction standard used by Article III federal courts, which follow *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc), and its progeny. Under this standard, the words of a claim are generally given their "ordinary and customary meaning," which is the meaning the term would have to a person of ordinary skill at the time of the invention, in the context of the entire patent including the specification. *See Phillips*, 415 F.3d at 1312–13.

Petitioner contends claim 1 should be construed to require that "the drop cable retain its external jacket as it is routed internally." Pet. 10. Petitioner contends this construction differs from Patent Owner's apparent construction in the district court, "which allows the external jacket to be

removed as the drop cable enters the DIB and the fibers routed inside the box without the external jacket." *Id.* at 10–11.

Although Patent Owner disagrees with Petitioner's construction, it contends "the Board need not resolve this claim construction dispute because Petitioner's proposed grounds 1-5 are all insufficient under either construction." PO Resp. 19.

Upon review of the parties' arguments and the prior art of record, we determine that no claim terms require express construction for purposes of this decision. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) ("The Board is required to construe 'only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.'" (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)). For example, we discuss below in Section III.G why we do not reach the claim construction issue presented by Petitioner.

D. Claims 1 and 11 over Holmberg and Battey

Petitioner contends the subject matter of claims 1 and 11 would have been obvious over the combined disclosures of Holmberg and Battey. Pet. 22–61.

1. *Holmberg*

Holmberg explains that in prior art passive fiber optic networks the main fiber cable lines may be separated into branch cables (e.g., drop cables, drop lines, breakout cables or stub cables) at mid-span locations. Ex. 1004 ¶¶ 4–6, 10, Fig. 1. Holmberg further explains that "[b]ranch cables are often connected to drop terminals . . . that include connector interfaces for facilitating coupling the fibers of the branch cables to a plurality of different subscriber locations." *Id.* ¶ 6.

Holmberg also discloses that "[f]iber optic networks can extend to multi-dwelling units such as apartment buildings and condominiums." Ex. 1004 ¶¶ 7, 11. Inside the multi-dwelling unit, "branch cables/fibers are optically coupled" to fibers of a main cable "at optical coupling locations (e.g., fusion splices, mechanical splices or connectorized optical couplings)." *Id.* ¶ 7. "The optical coupling locations can be enclosed within one or more wall boxes that are typically equipped with doors/covers that can be opened to provide easy access to the optical coupling locations." *Id.* "The wall boxes are typically provided at different floors of the multi-dwelling unit with each wall box having optical coupling locations corresponding to a plurality of different subscribers (e.g., each resident on a given floor)." *Id.*

Holmberg discloses "wall boxes configured to be easily mounted at mid-span locations along the length of a fiber optic telecommunications cable." Ex. 1004 ¶ 34. Preferably, the disclosed wall boxes are used for "indoor applications such as multi-dwelling units, or commercial buildings where a plurality of subscribers is located." *Id.*

Figure 3 of Holmberg is reproduced below.

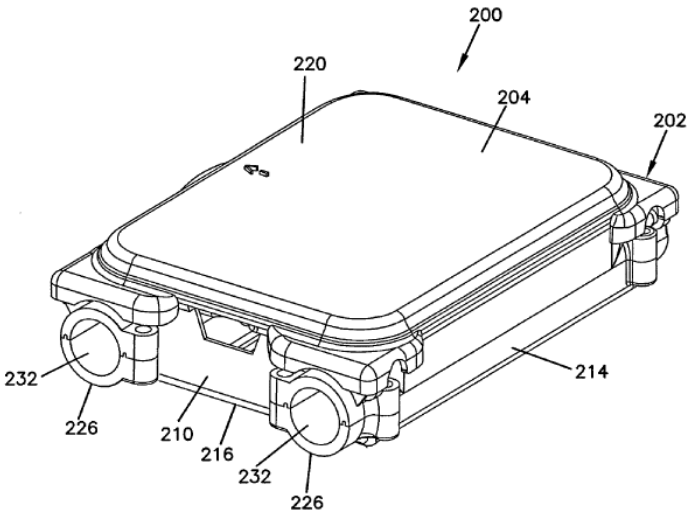


Figure 3 "is a front, left and bottom side perspective view of a wall box" of

Holmberg. Ex. 1004 ¶ 12. Wall box 200 includes a generally rectangular enclosure 202 that includes main body 216 and front cover 220. *Id.* ¶ 35. Front cover 220 is pivotally mounted to main body 216 and is movable between an open and closed position. *Id.* Cable covers 226 may be removed to allow insertion of cable into enclosure 202 through openings 232, and cable covers 226 may then be attached to main body 216 "to cover the corresponding open region 222 and enclose the mid-span location of the cable within the enclosure 202." *Id.* ¶ 37.

Figure 4 of Holmberg is reproduced below.

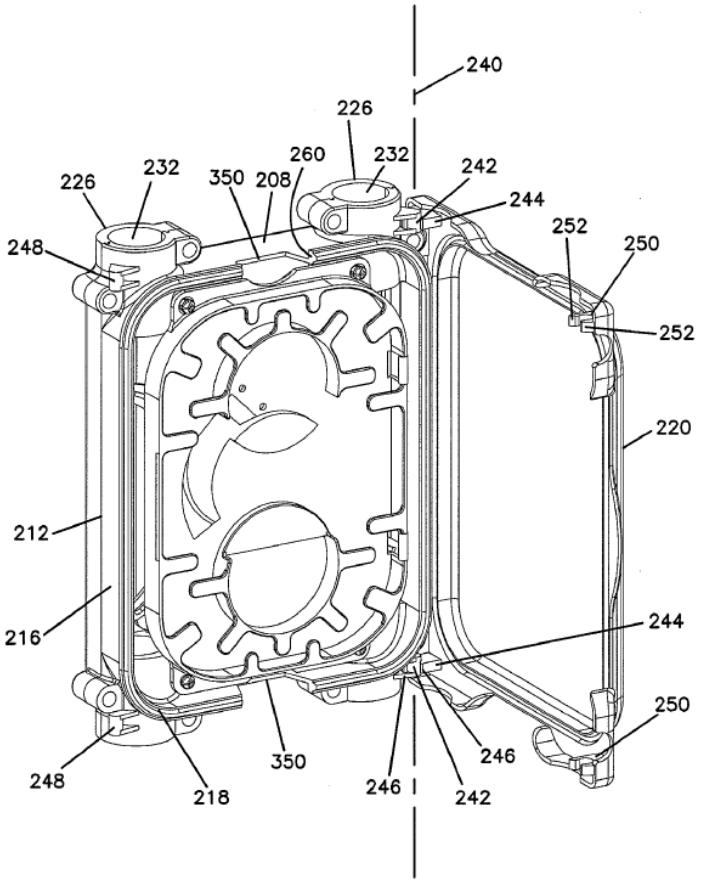


Figure 4 is a front perspective view of the wall box of Figure 3 with the front door open. Ex. 1004 ¶ 13. As shown in Figure 4, front cover 220 is pivotally connected to main body 216 at vertical pivot axis 240. *Id.* ¶ 38.

Figure 6 of Holmberg is reproduced below.

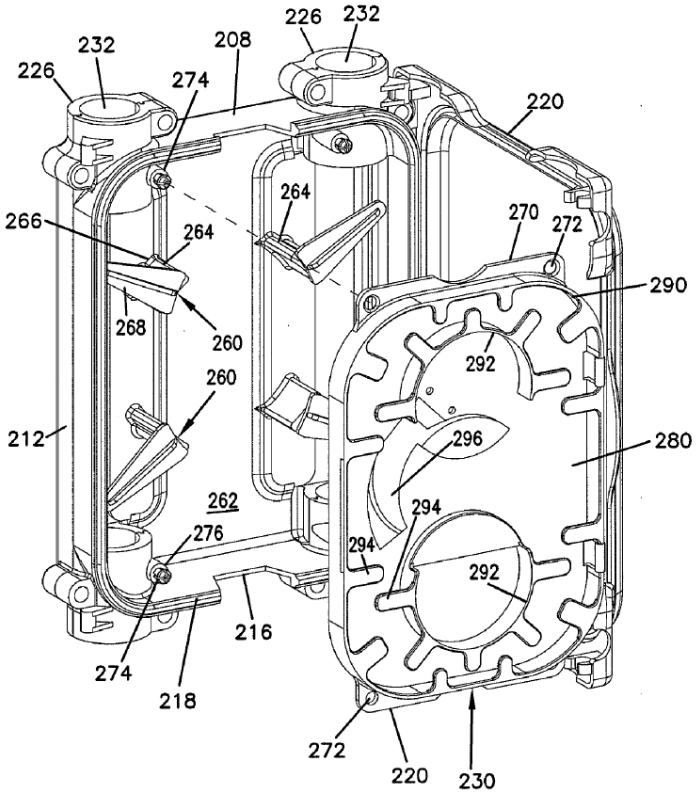


Figure 6 is a front perspective view of the wall box of Holmberg, "with the front door open and with a splice tray exploded outwardly from the interior of the wall box." Ex. 1004 ¶ 15. As shown in Figure 6, four cable management members 260 are integrally formed with a back wall 262 of main body 216, each having a bend radius limiter 264 that projects forwardly from rear wall 262. *Id.* ¶ 41. Each bend radius limiter 264 defines an outer curved surface 266 "having a curvature that satisfies the minimum bend radius requirements of the optical fiber desired to be stored within the enclosure 202." *Id*.

Splice tray 230 also provides cable/fiber management within the interior of enclosure 202 and includes fastener openings 272 allowing a threaded fastener to be inserted to fasten splice tray 230 to enclosure 202.

Ex. 1004 ¶ 42. Fiber storage walls 292 project forwardly from main panel 280 "so as to form an elongated fiber storage loop at the front side of the main panel 280." *Id.* ¶ 43. Fiber storage walls 292 have an outer curvature that is selected to provide bend radius protection. *Id.* "One or more passages 296 can be defined through the main panel 280 for allowing optical fibers to be routed from a back side to a front side of the splice tray 230." *Id.* ¶ 44.

Figure 7 of Holmberg is reproduced below.

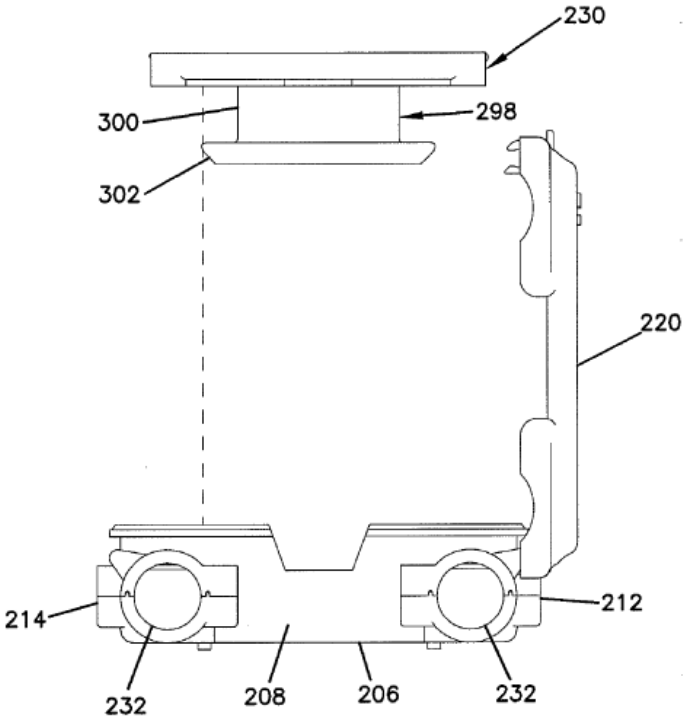


Figure 7 is a top view of the wall box with the front door open and the splice tray exploded outwardly from the interior of the wall box. Ex. 1004 ¶ 16. As shown in Figure 7, splice tray 230 includes spool structure 298 that projects rearwardly from the back side of main panel 280. *Id.* ¶ 45. Spool structure 298 includes cylindrical spool 300, about which excess fiber can be

wrapped, and annular flange 302 that assists in retaining fibers spooled about spool 300. *Id.*

Figure 12 of Holmberg is reproduced below.

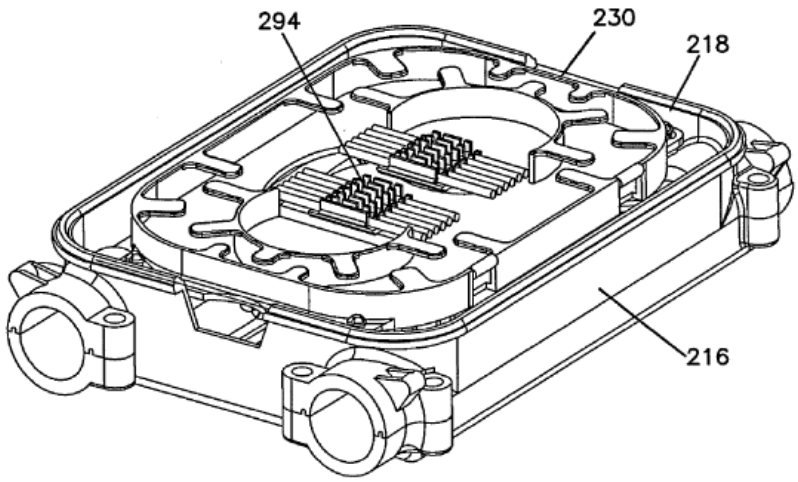


Figure 12 shows a wall box "with the front cover removed and fiber optic splices provided at the splice tray." Ex. 1004 ¶ 21. As shown in Figure 12, splice sleeve holders 294 can be mounted to main panel 280 in the region between fiber storage walls 292. *Id.* ¶ 44. Splice sleeve holders 294 are adapted for holding splice sleeves used to provide mechanical support to a fusion splice formed between optical fibers. *Id.*

2. *Battey*

Battey discloses an enclosure deployed in fiber optic communications networks. Ex. 1005 ¶ 3. Figure 3 of Battey is reproduced below.

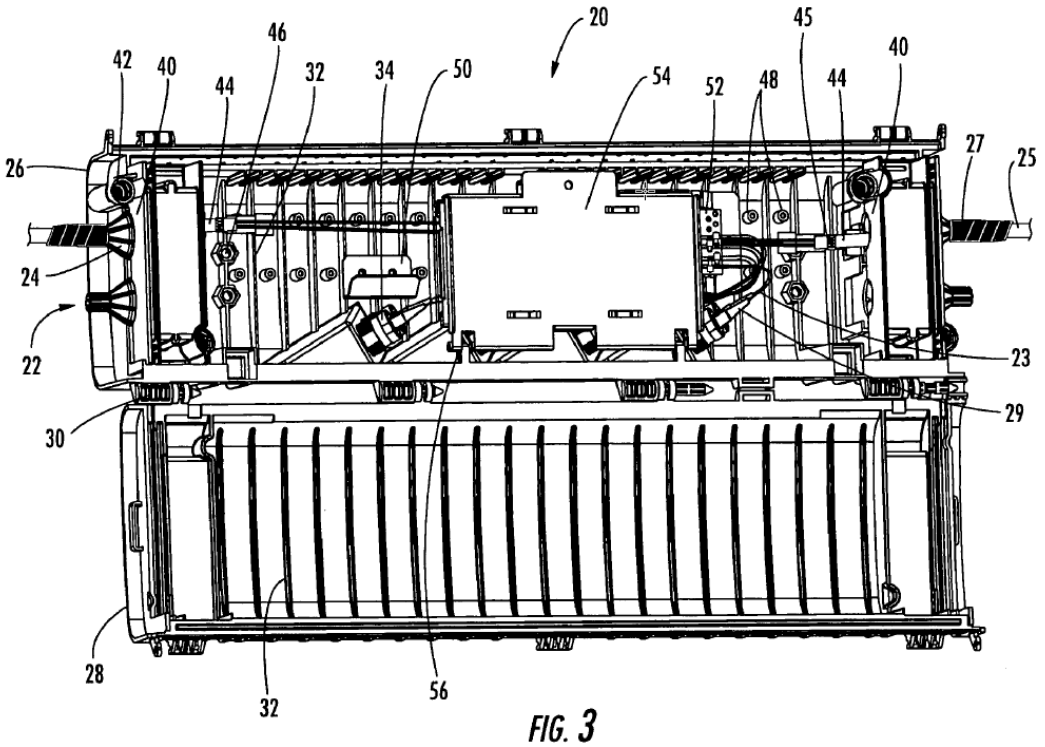


FIG. 3

Figure 3 is a perspective view of an aerial optical connection closure with the cover in opened position to show the internal compartment of the closure. *Id.* ¶¶ 13–15. Battey explains that in applications in which optical fibers of a distribution cable are spliced to pigtails in the field, "a conventional splice organizer or splice tray (obscured) is mounted to a work shelf 54, preferably on the side of the shelf 54 facing the base 26." *Id.* ¶ 38. Shelf 54 is preferably hingedly affixed to an interior wall of base 26 at hinge locations 56. *Id.* ¶ 39. Hinge locations 56 may be on the same side or the opposite side as the hinge locations of closure 20. *Id.* "Preferably, the distribution cable 25 is routed through the interior of the connection closure 20 beneath the shelf 54 so as to not interfere with the movement of the shelf 54 between the opened and closed positions." *Id.* A slack basket 50 may be used to receive and store slack lengths of optical fibers and/or optical fiber buffer tubes. *Id.* ¶ 36.

3. *Analysis—Claim 1*

Petitioner contends that the combination of Holmberg and Battey discloses every limitation of claim 1. Pet. 23–61. In particular, to the extent the preamble of claim 1 is limiting, Petitioner contends Holmberg discloses a drop interface box (wall box 200) that is configured to be mounted to a structure and receive a drop cable from an optical service provider, as well as a plurality of distribution cables that distribute an optical fiber service.[5] *Id.* at 23–29 (citing Ex. 1004 ¶¶ 5–7, 34, 37, 48, 52–53; Ex. 1003 ¶¶ 67–73).

With respect to limitation 1[a], Petitioner contends that the wall box of Holmberg includes an entrance (openings 232) configured to receive a drop cable, as well as retaining mechanisms (cable management members 260) spaced apart and configured to retain a length of drop cable looped around the drop cable retaining mechanisms. Pet. 29–32 (citing Ex. 1004 ¶¶ 35, 37, 38, 40, 41, 45–50, 52–54, Figs. 3–10; Ex. 1003 ¶¶ 67, 76–78). Petitioner further contends that at least a portion of the jacketed drop cable inside main body 216 of wall box 200 of Holmberg is stripped to expose individual cables, which are then looped around cable management members 260 (which include bend radius limiters 264 and cable retention members 268). *Id.* at 30–31 (citing Ex. 1004 ¶¶ 41, 45, 52–53; Ex. 1003 ¶ 78).

With respect to limitation 1[b], Petitioner contends that Holmberg discloses a front cover 220 that is pivotally mounted to main body 216 using a hinged connection and is able to selectively enclose the storage area of

[5] We need not resolve whether the preamble of claim 1 is limiting because there is no dispute that Holmberg discloses the recited subject matter.

enclosure 202. Pet. 32–35 (citing Ex. 1004 ¶¶ 35, 38–39, Figs. 3, 4; Ex. 1003 ¶¶ 79–81).

With respect to limitation 1[c], Petitioner contends that Holmberg's splice tray 230 "provides cable/fiber management within the interior of the enclosure 202" and is configured to be stored between the base unit (main body 216) and the cover (cover 220). Pet. 35–36 (Ex. 1004 ¶¶ 35, 41–45, 52–53, Figs. 4, 6). Petitioner concedes that splice tray 230 does not have a hinged connection, or a hinged connection at a location opposite the hinge for the cover, but contends this configuration was "well known in the prior art" and modifying Holmberg to have this configuration would allow "convenient access to the splice tray, as *Battey* expressly teaches," as well as easier access to "components located behind the splice tray in main body 216, such as the drop cable." *Id.* at 38, 40–41, 43–44 (citing Ex. 1005 ¶ 39; Ex. 1003 ¶¶ 38–39, 90–93). Petitioner further contends that the proposed combination is "a simple substitution of a hinged connection instead of a fastener" that would obtain the "predictable result of a rotatable splice tray with a hinged connection," as is taught in Battey. *Id.* at 43

With respect to limitation 1[d], Petitioner contends that Holmberg teaches that the drop cable is stripped of its external jacket and the internal fiber components then separated out into terminated fibers (feed break-out cables) which are then spooled around spool structure 298. Pet. 47–50 (citing Ex. 1004 ¶¶ 45, 53, Fig. 7; Ex. 1003 ¶ 99). Petitioner further contends that the spooled terminated fibers may be spliced to a corresponding fiber of another cable, such as a distribution cable, and these distribution cables may then be looped around fiber storage walls 292 on the front side of splice tray 230. *Id.* at 55–56, 58 (citing Ex. 1004 ¶¶ 45, 53; Ex. 1003 ¶¶ 106–107, 109–110). According to Petitioner, spool structure

298 constitutes spools[6] capable of storing a plurality of feed break-out cables coupleable to the drop cable, and fiber storage walls 292 of splice tray 230 constitute spools capable of storing distribution cables coupleable to the plurality of feed break-out cables. *Id.* at 49–50, 55–58.

Patent Owner contends Petitioner fails to demonstrate that claim 1 would have been obvious over Holmberg and Battey because (a) one of ordinary skill in the art would not have sought to combine the two references; (b) Petitioner relies upon new evidence in its reply to support its motivation to combine arguments; and (c) replacing Holmberg's fastened splice tray with a hinged splice tray would change the principle of operation of Holmberg and render it inoperable for its intended purpose. PO Resp. 21–63. We address these arguments below.

a. *Motivation to Combine Holmberg and Battey*

Patent Owner contends that, because the large majority of fibers from the main fiber cable in mid-span enclosures are not terminated and pass through to other downstream mid-span locations, these enclosures are "designed to limit access to those pass-through fibers of the main fiber cable that were not being spliced or dropped at that particular location." PO Resp. 28 (citing Ex. 2007 ¶ 163). And, given the significant differences

[6] To the extent claim 1 is construed to require more than one spool for retaining the feed break-out cables, Petitioner contends that one of ordinary skill in the art would have found it obvious to manufacture the cylinder of Holmberg's spool structure 298 using two pieces. Pet. 51–53. Patent Owner does not assert that spool structure 298 fails to satisfy the "spools" limitation of claim 1 or contest Petitioner's argument regarding the motivation to construct spool structure 298 using two separate pieces. We determine that the claims do not require more than one spool, but that it would have been an obvious modification to do so, as noted by Petitioner.

between network interface devices ("NIDs") (or the DIB of the '483 patent) and "Holmberg's mid-span access location enclosures," Patent Owner contends one of ordinary skill in the art "would not be motivated to use Holmberg's wall box as an NID, and there is nothing in Holmberg to suggest otherwise." *Id.* at 24, 36 (asserting that the output cable from Holmberg's wall box "is the input or drop cable to an NID or the DIB 10 of the '483 Patent").

Patent Owner also contends that there would have been no reason or advantage in allowing easy access to the backside of splice tray 230 or the cables that pass through the enclosure, in view of Holmberg's design and mid-span location. PO Resp. 31–38. Patent Owner contends that once the output cables have been spliced to the main cable fibers and securely spooled on the front of splice tray 230, splice tray 230 is securely fastened to enclosure 202 with four fasteners 276, "intentionally restricting access to the rear side of the splice panel 230 and the main fiber cable." *Id.* at 37 (citing Ex. 1004 ¶ 42, Fig. 4). And, according to Patent Owner, one of ordinary skill in the art would not have needed routine access to portions of the enclosure behind splice tray 230 because Holmberg's splices and splice sleeve holder 294 are "readily accessible on the front of the splice tray 230," and "splices could be repaired without necessarily having to access the rear side of the splice panel 230." *Id.* (asserting that fibers spooled behind splice tray 230 could "be accessed by a technician through the opening 296"). Patent Owner further contends that intentionally restricting access to the rear side of splice tray 230 is desirable because, "if the pass-through fibers from the main fiber cable stored behind the splice tray 230 were inadvertently cut or otherwise disturbed after the initial installation, that would disconnect and

disturb service to the numerous subscribers downstream of the mid-span access location." *Id.* at 37–38 (citing Ex. 1003 ¶¶ 180–181).

We find that Holmberg expressly contemplates using its wall box within multi-dwelling units, notes that multi-dwelling wall boxes in the prior art were "typically provided" on every floor, and discloses that the multi-dwelling wall boxes would contain optical couplings for each resident on a given floor. Ex. 1004 ¶¶ 7, 34; Pet. Reply 8–10. In view of these disclosures, we credit the testimony of Dr. Kiaei that one of ordinary skill in the art would have sought to use Holmberg's wall box in multi-dwelling units and would have seen a need to access the area behind spice tray 230 to connect and disconnect subscribers. Ex. 1003 ¶ 92; Ex. 1033 ¶¶ 7–8. Moreover, even if Holmberg were limited to mid-span locations and distributing drop cables, as opposed to distribution cables for individual subscribers, as asserted by Patent Owner, Patent Owner does not dispute that a technician would still need periodic access to the area behind splice tray 230 in these mid-span devices. Tr. 38:3–39:1 (counsel agreeing that one would need to access the area behind splice tray 230 in Holmberg, albeit in "rare occasions"); Ex. 1003 ¶¶ 90–92; Ex. 1033 ¶¶ 7–8. Thus, whether used in the manner contemplated by Petitioner or Patent Owner, Petitioner persuasively demonstrates that access to the space behind splice tray 230 in Holmberg would be necessary.

With access behind splice tray 230 required, Petitioner persuasively demonstrates that one of ordinary skill in the art would have seen a benefit to replacing Holmberg's fasteners or screws with a hinged connection, such as that disclosed in Battey, to allow easier access to the area behind the splice tray. Pet. 41 (citing Ex. 1005 ¶ 39 (disclosing that a rotatable splice tray or shelf would "provide[] full and convenient access to the splice

tray")). First, Petitioner and Dr. Kiaei persuasively demonstrate that once the fibers of Holmberg are routed from behind splice tray 230 and the distribution cables spooled on this tray, a technician could not reasonably access fiber optic cables stored behind splice tray 230 without releasing or opening splice tray 230. Pet. Reply 14–15 (citing Ex. 1023, 60:20–61:15); Ex. 1033 ¶¶ 31–32. Second, Petitioner persuasively demonstrates that without a hinged connection, the technician would have to either hold the splice tray of Holmberg with one hand while performing the necessary routing and splicing steps, two screws would need to remain in place (essentially replicating a hinge), or the tray would have to be left to dangle, supported only by the routed and spliced fibers. Pet. Reply 19–20.

Patent Owner contends that, in the rare instance after installation that the fastener-mounted splice tray 230 in Holmberg needs to be removed, a person of ordinary skill in the art "would understand that it would be advantageous to completely remove the splice tray 230 to provide unobstructed access to the main body 216 of the interior of enclosure 202." PO Resp. 62–63 (citing Ex. 1005 ¶ 39; Ex. 1014 ¶ 26). Patent Owner further contends that one of ordinary skill in the art would have understood that removal of a splice tray that is secured with fasteners would be easier than a splice tray with a hinged connection because the removed splice tray "could be maneuvered in three-dimensions to assist with unspooling the stored fibers" thereby removing "stress on those same fibers and splices." *Id.* at 63 (citing Ex. 1003 ¶¶ 230–232).

A proposed combination will often have simultaneous advantages and disadvantages, and this does not necessarily obviate a motivation to combine. *See Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006). Nor must Petitioner demonstrate that the proposed combination

is the best option, or constitutes an "improvement" over the use of fasteners, only that the use of hinged connection would have been understood to be a "suitable option." *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1381 (Fed. Cir. 2023). On this record, we credit the testimony of Dr. Kiaei that one of ordinary skill in the art would have seen a benefit to using a hinged connection in Holmberg's device and that the use of a hinged connection in Holmberg in place of its fasteners was a suitable option. Ex. 1003 ¶¶ 91–92; Ex. 1033 ¶¶ 33, 39–46.

Patent Owner contends the use of a hinged connection in Holmberg is not a suitable option because a hinged connection would risk inadvertent access by unskilled technicians resulting in damage to the critical fibers of the main cable.[7] PO Resp. 38 (noting that if the pass-through fibers of Holmberg were inadvertently cut or disturbed, it would disconnect numerous downstream subscribers). Both Petitioner and Patent Owner agree, however, that the fasteners of Holmberg are easily removed. Pet. Reply 12 (citing Ex. 1033 ¶¶ 20–22); Sur-reply 13. Thus, the desire to prevent inadvertent access to the enclosure of Holmberg by untrained technicians is not significantly advanced by the fasteners of Holmberg. And, as noted by Petitioner, if one of ordinary skill wished to prevent inadvertent access to the enclosure of Holmberg when the device is equipped with a hinged

[7] Patent Owner also contends that use of a hinged connection in Holmberg would unduly strain the optical fibers and splices on the splice tray. We address that issue below.

connection, many methods were known in the art that could achieve this result. Pet. Reply 12–13 (citing Ex. 1033 ¶¶ 23–27).

In view of the foregoing, we credit the testimony of Dr. Kiaei that one of ordinary skill in the art would have needed to access the portion of Holmberg's enclosure behind splice tray 230 and would have seen a benefit to using a hinged connection, as opposed to a fastened connection, to hold the splice tray in place in a rotatable fashion. Ex. 1003 ¶¶ 90–93; Ex. 1033 ¶¶ 8–9, 31–33. Moreover, "when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element known in the field, the combination must do more than yield a predictable result." *KSR*, 550 U.S. at 416. Petitioner persuasively demonstrates that hinged connections were well known in the art, that hinged connections had previously been used to allow rotational movement of splice trays, and that the proposed combination yields a predictable result. Ex. 1005 ¶ 39; Pet. 40–41 (asserting that the use of a hinged splice tray would constitute the use of a known technique to similarly improve a known device in the same way); Ex. 1003 ¶¶ 90–93.

b. *Allegedly New Arguments on Reply*

Patent Owner contends that Petitioner's arguments regarding the benefits of a hinged connection when performing the splicing and routing steps should be dismissed or ignored because they were improperly raised for the first time on reply. Sur-reply 19–20. We disagree. The Petition asserts that one of ordinary skill in the art would have sought to add a hinged connection, such as that disclosed in Battey, in Holmberg and would have seen a benefit to so doing. Pet. 40–44. Petitioner did not change its proposed combination or its stated rationale in its Reply. Rather, in response

to Patent Owner's counter-arguments, Petitioner expands upon the benefits of its proposed combination, i.e., the substitution of a hinged connection in place of fasteners. Pet. Reply 15–21. This is permissible, as a reply may properly expand on or extend previously raised arguments relating to the motivation to make the proposed changes to the prior art. *See Rembrandt Diagnostics, LP v. Alere, Inc.*, 76 F.4th 1376, 1385 (Fed. Cir. 2023) (explaining that the reply arguments properly relied on the same legal ground, the same prior art references, and same legal argument—the motivation to make the proposed changes to the prior art reference).

c. *Basic Principle of Operation and Inoperable for Intended Purpose*

A proposed combination may be non-obvious if "[the] suggested combination of references would require a substantial reconstruction and redesign of the elements" shown in the main reference, or if the proposed combination would change the basic principles under which the reference was designed to operate. *In re Ratti*, 270 F.2d 810, 813 (CCPA 1959). Patent Owner contends that modifying Holmberg to have a hinged connection would "change the basic principle of operation of Holmberg's splice tray and render it inoperable for its intended purpose (*i.e.*, to store cables and splices without detrimentally straining the terminated fibers or the drop cable and without severing any splices)." PO Resp. 44.

Patent Owner contends the '483 patent discloses several critical features that prevent the rotation of the hinged storage panel from straining or otherwise compromising stored fibers and splices. PO Resp. 45. In particular, Patent Owner contends the DIB of the '483 patent includes "spools, cable clips, and integrated cable channels that maintain cable radius during transitions of cable from the storage side or plane of the panel to a

connector side or plane of the panel." *Id.* (quoting Ex. 1001, 2:10–14, Fig. 4-1, code (57)). The '483 patent also discloses routing cable from base 205 to storage panel 405 near the storage panel hinge, which "allows the panel to be operated (opened and closed) without excessive stress to the cable transition." *Id.* at 48–49 (quoting Ex. 1001, 5:43–50, Fig. 5-4). The DIB of the '483 patent also has an integrated cable channel, positioned parallel to the panel hinge, that maintains cable radius while transitioning the feeder cables from the storage clips on the back of the panel to the connectors on the front of the panel. *Id.* at 49–51 (citing Ex. 1001, 5:55–61, Figs. 5-3, 5-4, 6-4).

Patent Owner contends that Holmberg's device does not include any of the features utilized in the '483 patent to allow the panel to be rotationally opened without detrimentally straining the fibers that are spooled and stored on the splice tray or the splices. PO Resp. 52 (citing Ex. 2007 ¶ 210). In contrast to the hinged panel disclosed in the '483 patent, Patent Owner contends that once the cables of the main fiber cable are spooled around spool structure 298 in Holmberg, and the output cables are spooled around fiber storage walls 292 on the front side of splice panel 230, any attempt to remove the panel without unspooling all of the fibers "would detrimentally strain and perhaps sever the fibers and splices." *Id.* at 57. Patent Owner further asserts that removing the spooled fibers is a cumbersome, time consuming, and delicate process "that would not provide any convenient access to the rear side of the splice tray 230 even if the splice tray 230 were hinged." *Id.* And, according to Patent Owner, use of a hinge would unnecessarily risk a scenario where a technician unfamiliar with the configuration and spooling used in Holmberg would unsuccessfully attempt

to swing open splice panel 230 and strain and damage the spooled fibers. *Id.* at 58.

Patent Owner contends the prior art references relied upon by Petitioner to show that hinged splice trays were known "actually teach the use of fixed storage panels with spools to store cables." PO Resp. 59. In particular, Patent Owner contends Battey uses slack storage guides that are fixedly mounted to the enclosure, not the hinged splice tray. *Id.* (citing Ex. 1005 ¶¶ 33, 36, Figs. 1–3). Likewise, Patent Owner contends Castonguay uses a fixedly mounted splice tray and fiber routing guides to store excess fibers. *Id.* at 60–61 (citing Ex. 1014 ¶¶ 33, 36–37, Figs. 4, 5).

We disagree with Patent Owner's argument that the use of a hinged connection in Holmberg would require an entire redesign of Holmberg's enclosure, or that such a modification would render Holmberg inoperable for its intended purpose. First, for the reasons set forth above, we are persuaded that a technician would need to access the area behind splice tray 230 either regularly or from time-to-time. To the extent Patent Owner is correct that removing splice tray 230 requires the cumbersome task of unspooling the fibers on the front of splice tray 230, this step would be required regardless of whether a hinged or fastened connection is used. And, we find that once the fibers are unspooled, a hinged connection would not put any more strain on the fibers and splices than merely allowing the unhinged tray to dangle supported only by the fibers and splices themselves. Ex. 1033 ¶ 40.

Second, Petitioner persuasively demonstrates that in Holmberg's design there is sufficient slack to allow splice tray 230 to be rotationally opened without excessively straining the fibers or splices. In particular, Dr. Kiaei persuasively testifies that during installation the panel would be in a "working position" so that the technician could work with fibers behind

the splice tray and wind extra slack on spool structure 298. Ex. 1033 ¶ 42. This is shown in the annotated figure below:

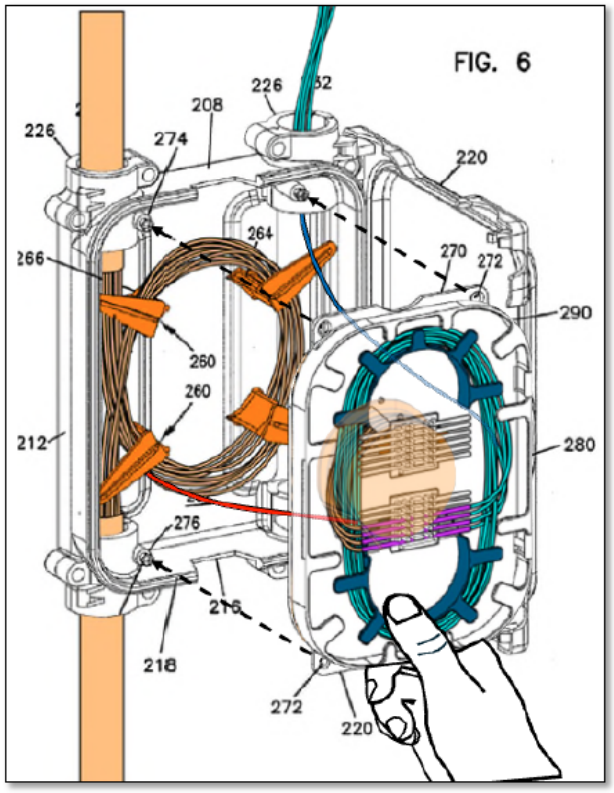


Figure 6 of Holmberg is shown above, as annotated and revised by Petitioner to depict the splice tray in a "working position." Pet. Reply 19; Ex. 1033 ¶¶ 38, 42. As shown in annotated Figure 6, Dr. Kiaei persuasively testifies that when moving from the "working position" to an "installed position," the teal output fibers would create slack around the retaining fingers (navy) on the front side of splice tray 230, as would the orange fibers on spool 298 (orange). Ex. 1033 ¶¶ 43–45; Pet. Reply 22–25. According to Dr. Kiaei, Holmberg accounts for this slack with its retention mechanisms, which prevent loose fibers from spilling out. Ex. 1033 ¶ 45 (citing Ex. 1023, 72:23–74:20). Dr. Kiaei also persuasively testifies that the spooled, but slightly slack fibers of Holmberg, would not need to be unspooled for the splice tray to be hingedly-moved from a closed to an open position. *Id.* ¶ 46.

Patent Owner contends Petitioner's "new theory that the stored fibers would not be tightly wound around the spool structure and retaining mechanisms on the front and back side of the Holmberg splice tray 230," are shown to be incorrect by Figures 5-4 and 6-4 of the '483 patent, which depict spooled fibers that are tightly wound around the spool structures and retaining mechanisms. Sur-reply 15. Patent Owner further contends that when a technician is working with fibers and creating splices, the splices would be formed several feet away from the wall box and then the spliced fibers would be spooled on the splice tray 230 before mounting. *Id.* at 16. According to Patent Owner, any excess length of fibers that remain after splicing would be securely spooled around the retaining mechanisms, and "whatever minimal slack may exist would not be sufficient to remove the splice tray 230 any reasonable distance to access the rear side of the splice tray without unspooling the fibers." *Id.* at 18 (citing Ex. 1033 ¶¶ 42–43).

As to the factual dispute regarding the amount of slack present in Holmberg, we credit the testimony of Dr. Kiaei that there would be sufficient slack in the spooled fibers to allow a hinged connection. Ex. 1033 ¶¶ 41–46. Moreover, we find that a technician spooling the main cable and distribution fibers on the back and front of splice tray 230 would ensure the presence of sufficient slack to allow a hinged connection, if necessary. *See id.* Although the '483 patent may tightly wind its spooled fibers around its retaining mechanisms, as asserted by Patent Owner, there is no persuasive evidence that this would be required in Holmberg, and Dr. Kiaei persuasively explains that the specific retaining mechanisms of Holmberg are designed to prevent *slack* fibers from spilling out. Ex. 1033 ¶ 45.

In view of the foregoing, we do not find that the device of Holmberg and Battey would be inoperable for its intended purpose or that the strain on

the cables and splices would negate any advantages of using a hinged connection, as asserted by Patent Owner.

d. *Conclusions – Claim 1*

For the reasons discussed above, Petitioner persuasively demonstrates that Holmberg and Battey teach or suggest every limitation of independent claim 1. Petitioner also provides a persuasive explanation as to why one of ordinary skill in the art would have combined Holmberg and Battey to arrive at the claimed invention with a reasonable expectation of success. Thus, Petitioner demonstrates by a preponderance of the evidence that claim 1 would have been obvious in view of Holmberg and Battey.

4. *Analysis—Claim 11*

Claim 11 depends from claim 1 and further requires "wherein the drop cable entrance further comprises slots formed in the base unit and configured to receive a cable clip which clips over the drop cable, the slots and the cable clip forming a substantially weather tight seal with the base unit." Ex. 1001, 8:33–37.

Petitioner contends Holmberg includes slots formed in the base unit and cable cover 226 that, in combination, form cable exit/enter openings 232. Pet. 59 (citing Ex. 1004 ¶¶ 37, 46–47). Petitioner further contends that the half cylinders function "as a cable clip" and "provide mechanical retention of the cable and also provide a seal around the perimeter of the cable jacket." *Id.* at 60–61 (citing Ex. 1004 ¶ 48). Dr. Kiaei testifies that one of ordinary skill in the art would have understood that the seal provided by the two half cylinders "would have been a substantially weather tight seal to prevent water, rain, excessive moisture,

dirt, or other such foreign objects from entering wall box 200." Ex. 1003 ¶ 113.

Patent Owner does not contest Petitioner's arguments and evidence with respect to claim 11, apart from its arguments with respect to claim 1 above.

Upon review of Petitioner's arguments and supporting evidence, we determine that Petitioner sufficiently identifies where every limitation of claim 11 is disclosed in Holmberg and Battey. Thus, Petitioner demonstrates by a preponderance of the evidence that claim 11 would have been obvious over the combined disclosures of Holmberg and Battey.

E. Claims 2, 12, and 13 over Holmberg, Battey, and Blankenship

Petitioner contends that the subject matter of claims 2, 12, and 13 would have been obvious in view of the combined disclosures of Holmberg, Battey, and Blankenship. Pet. 62–73.

1. *Blankenship*

Blankenship discloses an enclosure for interconnecting optical fibers. Ex. 1006, 1:7–8. Figure 2 of Blankenship is reproduced below:

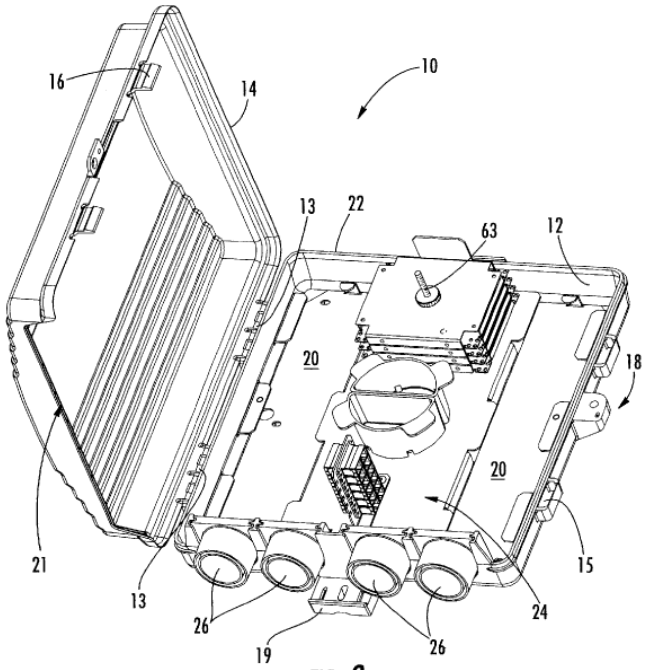


FIG. 2.

Figure 2 is a front perspective view of the fiber optic network interface device (NID) of Blankenship. *Id.* at 2:1–2. As shown in Figure 2, fiber optic NID 10 comprises a base 12 with a movably attached protective cover 14. *Id.* at 2:32–36. Entry ports 26 are in communication with the interior cavity 24 and allow receiving a feeder cable from an optical network and a "distribution cable from a subscriber premises." *Id.* at 3:4–15.

Figure 6 is reproduced below:

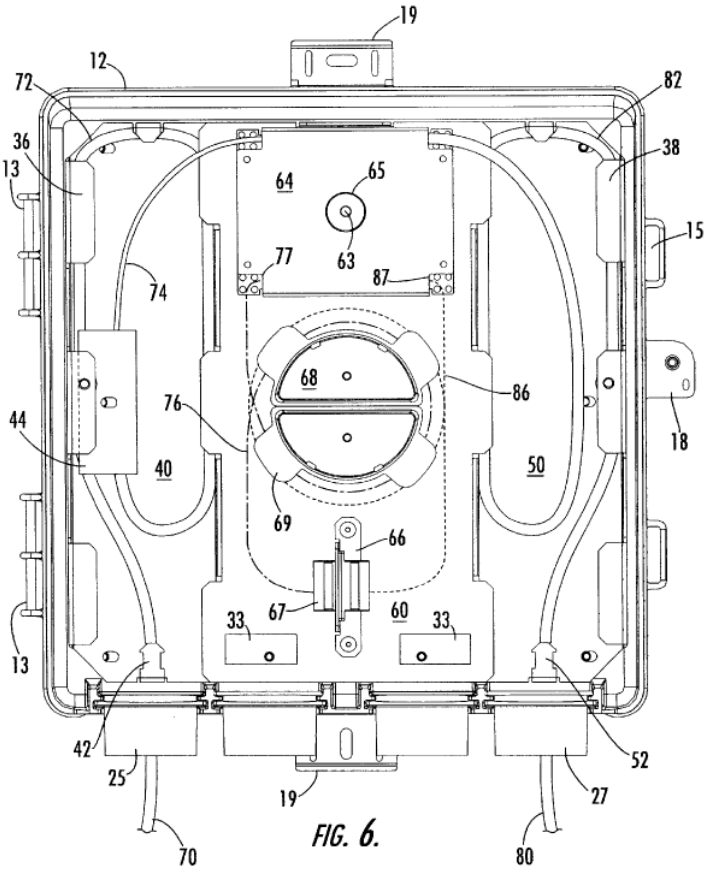


FIG. 6.

Figure 6 is a front plan view of the fiber optic NID of Blankenship. Ex. 1006, 2:9–12. As shown in Figure 6, the device includes first fiber management area 40, second fiber management area 50, and fiber connecting area 60. *Id.* at 3:42–46. First fiber management area 40 is in direct communication with first port 25 and second fiber management area 50 is in direct communication with second port 27. *Id.* at 3:49–56. Fiber management area 60 is located adjacent to the first and second fiber management areas so that the lengths of optical fiber that must be routed within the interior cavity 24 are minimized. *Id.* at 3:56–60. Adapter bracket 66 includes a plurality of adapters 67 for receiving a first and second connector in optical alignment "to join the optical fiber of the feeder cable

and the optical fiber of the distribution cable." *Id.* at 6:1–5.

As shown in Figure 6, Blankenship includes strain relief brackets 42 and 52 that relieve strain on the feeder cable (bracket 42) and distribution cable (bracket 52). Ex. 1006, 4:32–35, 4:61–65.

2. *Analysis—Claim 2*

Claim 2 depends from claim 1 and further requires "wherein the fiber storage panel further includes an adapter bracket configured to hold one or more adapters which couple the plurality of feed break-out cables to the plurality of distribution cables." Ex. 1001, 7:47–50.

Petitioner contends that Holmberg does not teach an adapter bracket that is configured to hold one or more adapters, but Blankenship does as its adapter bracket 66. Pet. 62–63. Petitioner further contends that one of ordinary skill in the art would have modified Holmberg-Battey "to utilize an adapter bracket holding one or more brackets to couple a plurality of feed break-out cables to a plurality of distribution cables," because Blankenship's adapters would have provided "simplified and robust optical connections between the fibers of the plurality of feed break-out cables and a plurality of distribution cables." *Id.* at 65–66 (citing Ex. 1003 ¶¶ 116–119).

Patent Owner contends Petitioner fails "to even allege where in the Holmberg wall box a [person of ordinary skill in the art] would have placed the Blankenship adapter bracket." PO Resp. 64. Patent Owner further contends that there would have been no need for Blankenship's adapters in Holmberg, because Holmberg already uses splice sleeve holder 294 to connect fibers to one another. *Id.* According to Patent Owner, "because Holmberg already discloses a solution that uses adapters without the use of

an adapter bracket located on a storage panel, there would be no need for . . . an additional and entirely unnecessary adapter bracket" in Holmberg.

Patent Owner also contends that Holmberg discloses alternative embodiments that use adapters on the front cover of the wall box and not on the alleged storage panel (i.e., splice tray 230). PO Resp. 65–67 (citing Ex. 1004 ¶¶ 56–57, Figs. 16–18; Ex. 2007 ¶ 239). And, because Holmberg already discloses a solution to the problem solved by the challenged patent, Patent Owner contends there would be no motivation to look to the prior art, such as Blankenship, for a redundant solution to the same problem. *Id.* at 69–71.

Petitioner contends there should be no confusion as to where the adapter bracket of Blankenship is used in the proposed combination as "[t]he petition identified one, and only one, coupling between feed break-out cables and distribution cables—splices mounted within splice sleeve holder 294." Pet. Reply 28. As such, "[g]iven the straightforward nature of the proposed combination, replacing one specific type of coupling with another, and the lack of any suggestion that this replacement would change the coupling location," Petitioner contends Patent Owner's argument should be rejected. *Id.*

Patent Owner contends in response that the Petition failed to carry its burden to establish where the adapter bracket of Blankenship would be placed in the Holmberg-Battey device, and Petitioner's belated argument that the adapter would replace the splice sleeve holder 294 is a new, untimely argument that should be ignored. Sur-reply 21–22.

The Petition contends that one of ordinary skill in the art would have used the adapter bracket of Blankenship in the device of Holmberg-Battey "to couple a plurality of feed break-out cables to a plurality of distribution

cables." Pet. 65. In Holmberg, the break-out cables and distribution cables are coupled on splice tray 230. Ex. 1004 ¶ 53 ("At the front side of the splice tray, the terminated optical fiber can be spliced to a corresponding fiber of another cable (e.g., a distribution cable) with the splice being mounted at the splice sleeve holder 294 as shown in FIG. 12."), Fig. 12. We agree with Petitioner that, without any further indication that the substitution would be anywhere other than splice tray 230, this is the intended location for the combination of Holmberg, Battey, and Blankenship.

Petitioner also persuasively demonstrates that the use of Blankenship's bracket and adapters would "provide simplified and robust optical connections between fibers of a plurality of feed break-out cables and a plurality of distribution cables." Pet. 66 (citing Ex. 1003 ¶¶ 116–119). Although Holmberg already uses splice sleeve holders to couple these fiber types, we agree with Petitioner that the substitution of one known method for another known method that yields a predictable, beneficial result ("simplified and robust optical connection[s]") would have been obvious. *See KSR*, 550 U.S. at 416 ("[W]hen a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result."); Ex. 1001, 5:3–10 (explaining that connectors and adapters that are used to convert between feed cables and distribution cables "are standard components used in the telecommunications industry").

Upon review of the parties' arguments and supporting evidence, we determine that Petitioner persuasively identifies where Holmberg, Battey, and Blankenship disclose every limitation of claim 2. Petitioner also provides a persuasive explanation as to why one of ordinary skill in the art would have sought to combine the three references to arrive at the subject

matter recited in claim 2 with a reasonable expectation of success. Thus, Petitioner demonstrates by a preponderance of the evidence that claim 2 would have been obvious over the combined disclosures of Holmberg, Battey, and Blankenship.

3. *Analysis—Claims 12 and 13*

Claim 12 depends from claim 11 and further requires "a strain-relief clamp coupled to the base unit proximate the drop cable entrance." Ex. 1001, 8:38–40. Claim 13 depends from claim 1 and further requires "a security mechanism for securing the cover to the base unit in a closed position." *Id.* at 8:41–43.

With respect to claim 12, Petitioner contends that Blankenship teaches the use of strain relief bracket 42 proximate to where feeder cable 70 enters NID 10. Pet. 66–67 (citing Ex. 1006, 4:28–35, 6:42–43, Fig. 6). Petitioner further contends that one of ordinary skill in the art would have sought to use the strain-relief backet of Blankenship in Holmberg to provide strain relief for the fiber optic cables entering the device and would have understood that the strain-relief bracket would be coupled to Holmberg's base unit. *Id.* at 67–68.

With respect to claim 13, Petitioner contends that Blankenship discloses several security mechanisms (locking screw, combination lock, key lock) for securing cover 14 to base 12 and one of ordinary skill in the art would have sought to use such mechanisms in Holmberg and Battey to prevent unauthorized access to the optical components and connections housed with Holmberg's wall box 200. Pet. 69–72.

Patent Owner does not address Petitioner's arguments with respect to claims 12 and 13, apart from its arguments relating to independent claim 1.

Upon review of Petitioner's arguments and supporting evidence, we determine that Petitioner persuasively identifies where Holmberg, Battey, and Blankenship disclose every limitation of claims 12 and 13. Petitioner also provides a persuasive explanation as to why one of ordinary skill in the art would have sought to combine the three references to arrive at the subject matter recited in claims 12 and 13 with a reasonable expectation of success. Thus, Petitioner demonstrates by a preponderance of the evidence that claims 12 and 13 would have been obvious over the combined disclosures of Holmberg, Battey, and Blankenship.

F. Claim 10 over Holmberg, Battey, and Cowen or Holmberg, Battey, Blankenship, and Cowen

Claim 10 depends from claim 1 and further requires "wherein the drop cable retaining mechanisms in the base unit comprise storage clips positioned on opposing sides of the base unit." Ex. 1001, 8:30–32. Petitioner contends the subject matter of claim 10 would have been obvious in view of the combined disclosures of Holmberg, Battey, and Cowen, as well as the combined disclosures of Holmberg, Battey, Blankenship, and Cowen. Pet. 81–88.

1. *Cowen*

Cowen is titled "Fiber Management Devices for Fiber Optic Housings, and Related Components and Methods." Ex. 1007, code (54). Figure 26B of Cowen is reproduced below:

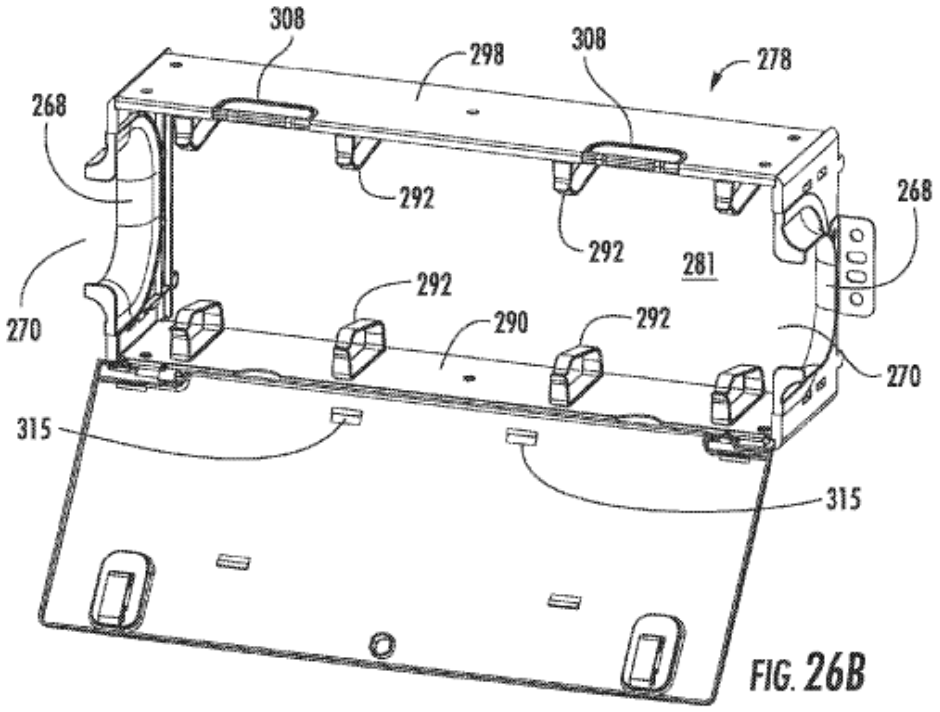


FIG. 26B

Figure 26B is a front perspective view of an exemplary fiber optic housing. Ex. 1007, 6:19–21. As shown in Figure 26B, the housing of Cowen includes clips 292 that are "used for routing control and management of fiber optic cables and optical fibers." *Id.* at 27:41–45. The cables and fibers "may be routed through one or more of the plurality of clips 292 and in or out of the openings 270 on either side of the removable front section 278." *Id.* at 27:46–50.

2. *Analysis—Claim 10*

Petitioner contends that Cowen discloses storage clips positioned on opposite sides of the housing and one of ordinary skill in the art would have sought to use such clips in the device of Holmberg, Battey, and Blankenship to supplement or replace Holmberg's cable management members 260. Pet. 84–87. According to Petitioner, use of Cowen's clips would "improve cable routing" and "would have provided more options for cable routing and management, improving product flexibility." *Id.* at 87 (citing Ex. 1003

¶¶ 149–155, 157). Petitioner contends such a combination would represent the use of known clips, according to known methods, to predictably yield improved cable routing and management, and one of ordinary skill in the art would have had a reasonable expectation of success in using Cowen's clips to retain the fibers of Holmberg and Battey. *Id.* at 87–88 (asserting that the proposed combination is "straightforward").

Patent Owner contends that Holmberg already supplies a solution for retaining cables within its housing and Petitioner's proposal to add a redundant solution from Cowen is a hindsight attempt to reconstruct the claimed invention. PO Resp. 71. Patent Owner further contends that use of Cowen's clips in Holmberg "would unnecessarily complicate the mid-span cable mounting process and result in a less effective solution." *Id.* at 72 (citing Ex. 2007 ¶ 256). According to Patent Owner, Cowen's clips are meant to fully encircle any cables and fibers that are routed through them, requiring a technician to either thread the end of a cut or terminated cable fiber through the open sides of the clip, or to lift up the end of a clip that is not attached to one of the enclosure panels, and insert the cable or fiber within. *Id.* at 76–77. Patent Owner contends such a routing method would make mounting the box at a mid-span location more difficult. *Id.* at 77–78.

It is undisputed that clips, as disclosed in Cowen, were a known method for cable retention within a fiber optic management housing. Ex. 1007, 27:41–50, Fig. 26B. Petitioner also persuasively demonstrates that replacing the cable management members of Holmberg with the clips of Cowen would represent the substitution of one known cable management structure for another known in the art and such a combination would yield a predictable result. Pet. 87 (citing Ex. 1003 ¶¶ 149–155, 157). As such,

Petitioner demonstrates that the use of Cowen's clips would have been obvious. *See KSR*, 550 U.S. at 416.

Petitioner also identifies a specific advantage to the use of Cowen's clips as a replacement for the cable management system of Holmberg, i.e., such clips would be more secure and provide better cable management. Pet. 87 (citing Ex. 1003 ¶¶ 149–155, 157). Patent Owner identifies drawbacks to the use of clips, such as the increased effort necessary to route the cables through the clips compared with the open retention arms of Holmberg, but a proposed combination may come with both advantages and drawbacks and this does not necessarily obviate obviousness. *See Medichem*, 437 F.3d at 1165. In this case, we credit the testimony of Dr. Kiaei that one of ordinary skill in the art, to the extent they were seeking a more secure method of cable management, would have sought to exchange the cable routing arms of Holmberg for the clips of Cowen. Ex. 1003 ¶¶ 149–155, 157.

In view of the foregoing, we determine that Petitioner demonstrates that Holmberg, Battey, and Cowen teach or suggest every limitation of claim 10. Petitioner also provides a persuasive explanation as to why one of ordinary skill in the art would have combined the disclosures of the three references to arrive at the subject matter of claim 10 with a reasonable expectation of success. Thus, Petitioner demonstrates by a preponderance of the evidence that claim 10 would have been obvious in view of Holmberg, Battey, and Cowen. As we find that claim 10 would have been obvious over Holmberg, Battey, and Cowen, we do not address whether claim 10 would also have been obvious over Holmberg, Battey, Cowen, and Blankenship.

G. Claims 1, 2, and 11–13 over Holmberg, Battey, and Blankenship

To the extent that claim 1 is interpreted to require that the "jacketed drop cable retain its external jacket as it enters and is routed inside the box," Petitioner contends claims 1, 2, and 11–13 would have been obvious over the combined disclosures of Holmberg, Battey, and Blankenship. Pet. 73–81.

In the Institution Decision, we interpreted the claims as not being limited to any particular cable type. Inst. Dec. 20–21; PO Resp. 18–19. The parties do not contest this conclusion with respect to this proceeding, or contend that the analysis of Holmberg and Battey would differ depending on the cable type used in these references. Tr. 6:13–23; PO Resp. 19. As such, we need not address Petitioner's additional arguments with respect to Holmberg, Battey, and Blankenship.

IV. CONCLUSION[8]

For the foregoing reasons, we determine that Petitioner demonstrates by a preponderance of the evidence that claims 1, 2, and 10–13 of the '483 patent are unpatentable. Our conclusions are summarized in the following table.

[8] Should Patent Owner wish to pursue amendment of the Challenged Claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding. See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

Claim(s)	35 U.S.C. §	Reference(s)/Basis	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
1, 11	103(a)	Holmberg, Battey	1, 11	
2, 12, 13	103(a)	Holmberg, Battey, Blankenship	2, 12, 13	
1, 2, 11–13	103(a)	Holmberg, Battey, Blankenship[9]		
10	103(a)	Holmberg, Battey, Cowen	10	
10	103(a)	Holmberg, Battey, Blankenship, Cowen[10]		
Overall Outcome			1, 2, 10–13	

V. ORDER

For the foregoing reasons, it is:

ORDERED that Petitioner demonstrates by a preponderance of the evidence that claims 1, 2, and 10–13 of the '483 patent are unpatentable; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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[9] Because we determine that claims 1, 2, and 11–13 would have been obvious over Holmberg and Battey (claims 1 and 11), as well as Holmberg, Battey, and Blankenship (claims 2, 12, and 13), we do not address Petitioner's arguments that claims 1, 2, and 11–13 would have been obvious over Holmberg, Battey, and Blankenship.

[10] Because we determine that claim 10 would have been obvious over Holmberg, Battey, and Cowen, we do not address Petitioner's additional arguments that claim 10 would have been obvious in view of Holmberg, Battey, Blankenship, and Cowen.

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