(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
15 July 2010 (15.07.2010)

PCT

(10) International Publication Number
WO 2010/080745 A1

(51) International Patent Classification:
G02B 6/44 (2006.01)

(21) International Application Number:
PCT/US2010/020075

(22) International Filing Date:
5 January 2010 (05.01.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/143,214 8 January 2009 (08.01.2009) US

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

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

(54) **Title**: FIELD TERMINATED FIBER PATCH PANEL FOR RACK AND WALL MOUNTING

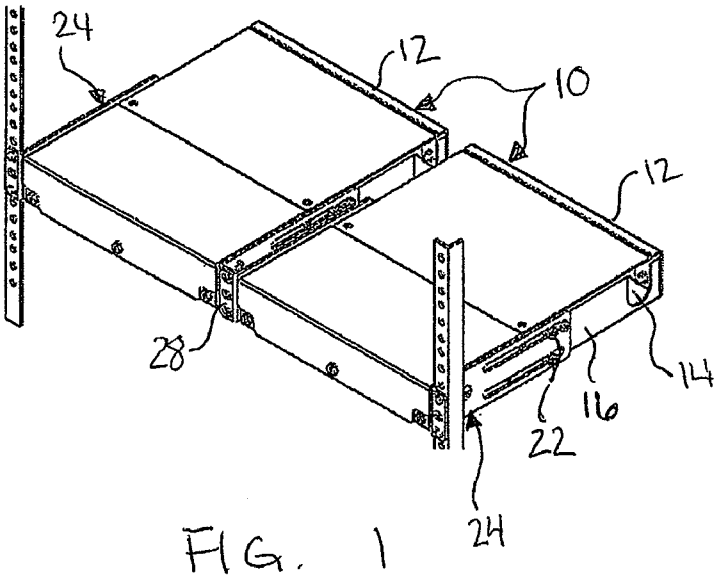


FIG. 1

(57) **Abstract**: The fiber optics patch panel assembly includes a pair of patch panels each having a base and a pair of first sides. A wall attachment portion is disposed on the base of each panel, and a mounting portion disposed on each of the first sides of each of the panels. A rack mounting bracket is attached to the mounting portion of one of the first sides of each of the panels. A panel attachment is attached to the mounting portion of an other of the first sides of each of the panels and attaches the panels to one another. A single panel can be wall-mounted, or rack mounted in a standard rack mount assembly using two panels and the rack mounting bracket, or mounted in a half-sized custom rack without needing any modifications.

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FIELD TERMINATED FIBER PATCH PANEL FOR RACK AND WALL MOUNTING

CROSS-REFERENCE TO RELATED PATENT APPLICATION

[01] This application claims the benefit of Provisional Application No. 61/143,214 filed January 8, 2009, in the United States Patent and Trademark Office, the disclosure of which is incorporated by reference in its entirety.

BACKGROUND

1. Field of the Invention

[02] The present invention relates to a fiber patch panel. More particularly, it relates to a fiber patch panel that is mountable on a rack and a wall.

2. Background of the Invention and Related Art

[03] Fiber optic patch panels take fiber bundles and terminate them in a format that makes the individual fibers accessible, generally by terminating the fiber into a standardized connector which is then inserted into the appropriate adapter for the connection. Currently, patch panel products are application specific; that is, either the housing is designed to mount to a wall or a rack, but not both. This causes contractors to hold inventory of two types of patch panels. Furthermore, when used in outside plant enclosures, only custom solutions are available.

[04] Accordingly, there remains a need for a fiber patch panel that is mountable on a rack as well as a wall without requiring substantial modifications.

SUMMARY OF THE INVENTION

[05] One object of the exemplary embodiments of the present application is to provide a fiber optic patch panel that is mountable on a rack, a wall, or in many custom outdoor racks without requiring substantial modifications.

[06] Another object of the exemplary embodiments of the present application is to provide a fiber optic patch panel that is easily accessible even when mounted in a stacked arrangement with a plurality of additional patch panels.

[07] One aspect of the exemplary embodiments provides a patch panel including a housing comprising a base and a pair of first sides extending perpendicularly from the base, wherein the base includes at least one wall attachment portion and the first sides each include a rack mounting portion.

[08] Another aspect of the exemplary embodiments provides a patch panel assembly including a pair of panels each including a base and a pair of first sides extending perpendicularly from the base; a wall attachment portion disposed on the base of each panel; and a mounting portion disposed on each of the first sides of each of the panels. A rack mounting bracket is attached to the mounting portion of one of the first sides of each of the panels, and a panel mounting bracket is attached to the mounting portion of an other of the first sides of each of the panels and attaching the panels to one another.

[09] It is intended that any other advantages and objectives of the present invention that become apparent or obvious from the detailed description or illustrations contained herein are within the scope of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[10] FIG. 1 is a perspective view of an exemplary embodiment of a pair of patch panels of the present invention mounted on a rack illustrating both of the panels in a flush-mounted position;

[11] FIG. 2 is a perspective view of the exemplary embodiment of FIG. 1 illustrating both of the panels in an extended forward position;

[12] FIG. 3 is a perspective view of the exemplary embodiment of FIG. 1 illustrating one of the panels in an extended position and one of the panels in a flush-mounted position; and

[13] FIG. 4 is a perspective view of an exemplary embodiment of the present invention illustrating the patch panel mounted to a wall.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS OF THE PRESENT INVENTION

[14] Exemplary embodiments of the present invention overcome the above disadvantages and other disadvantages not described above. Also, the present invention is not required to overcome the disadvantages described above, and an exemplary embodiment of the present invention may not overcome any of the problems described above.

[15] Figs. 1-4 illustrate exemplary embodiments of the patch panel of the present invention. The patch panel can be used in wall mounting applications, rack mounting applications, and outside plant closure applications, without the need for modification, solving inventory problems.

[16] With reference to Fig. 1, a fiber optics patch panel **10** includes a housing **12** that has a base **14**, and a pair of opposing first sides **16** extending perpendicularly from the base **14**. One or more bulkheads (not shown) may be housed within the housing **12** for connecting bundles of optical wires (not shown), and the like. The panel **10** may also include a pair of opposing second sides **18** extending perpendicularly from the base **14** and perpendicular to the first sides **16**.

[17] As shown in Fig. 4, the base **14** includes a plurality of wall mounting portions **20** for mounting the panel **10** to a wall, or the like. The embodiment of Fig. 4 illustrates an exemplary embodiment wherein the four wall mounting portions **20** are tear-drop shaped

through holes that are flush with the base **14** and are in spaced arrangement relative to one another. The through holes in the base **14** of the panel **10** allow the panel **10** to be attached directly to a wall without the need for additional mounting brackets or any further modifications. In Figs. 1-3, the base **14** is located at an underside of each of the panels **10** and thus, the wall mounting portion **20**, although included, is not shown.

[18] Those skilled in the art would understand that the wall mounting portion **20** is not limited to the through holes illustrated in the exemplary embodiment of Fig. 4. For example, the wall mounting portion **20** may instead include one or more embossed or debossed portions (not shown) that each include a slot or through hole. More specifically, an embossed portion, i.e., a portion of the base that is raised in a direction away from the wall, may include a through hole at a top thereof for receiving a mount on a wall, or a debossed portion, i.e., a portion of the base that is indented in a direction toward the wall, may include a through hole at a bottom portion thereof for receiving the mount on the wall. Another alternative for the mounting portion **20** may be one or more snap connecting portions (not shown) that are configured to snap into and out of a plate disposed on the wall, or other such wall mount.

[19] Each of the first sides **16** includes a mounting portion **22**. In the exemplary embodiments shown in Figs. 1-4, the mounting portion **22** is a plurality of elongated through holes extending through each first side **16**.

[20] The panel **10** includes a rack attachment bracket **24** detachably attached to the mounting portion **22** of one of the first sides **16** of each panel **10** to mount the panel **10** to a rack **26**. A panel attachment **28** may be detachably attached to the mounting portion **22** of the other of the first sides **16** to mount the panel **10** to a second panel **10**. That is, the mounting portion **22** attaches the panel **10** either to another panel **10** or to a rack **26**. The panel attachment **28** may be one of many commonly-known fasteners. In the exemplary

embodiments, the panel attachment **28** is a plurality of bolts that extend through the holes on each side **16**, and corresponding nuts. However, those skilled in the art would understand many other arrangements for the mounting portion **22** and the panel attachment **28** that would detachably attach two panels **10** to one another, such as a screw, a clevis pin, etc.

[21] In the exemplary embodiments of Figs. 1-3, the rack attachment bracket **24** is a plate that includes at least one slot **30**, and the mounting portion **22** on each first side may be a through hole in combination with a projection extending through the through hole that engages and slides within the slot **30** of the rack attachment bracket **24**. However, it is understood that other arrangements that allow the panel **10** to slide relative to the rack **26** may be within the scope of the present application. For example, the rack attachment **24** may include a projection and the first side may include a slot as the mounting portion **22**. Alternatively, the mounting portion **22** may be a projection extending directly from a surface of the first side **16**.

[22] The width of the base **14** is one-half of the width of a standard rack mounting assembly in a 19 inch rack. Two panels **10** are attached to one another side by side through a panel attachment **28** whereby the two attached panels **10** fit into a single rack width.

[23] The exemplary embodiments of the panel **10** may be wall-mounted, as shown in Fig. 4, in which case the base **14** of the panel **10** is positioned vertically, or instead can be rack-mounted, as shown in Figs. 1-3, in which case the base **14** is positioned horizontally. The panel **10** may also be mounted in many outdoor custom racks, which are typically half the width of an industry standard rack; that is, only a single panel **10** may be used to mount the panel **10** to a custom half-sized rack.

[24] When rack-mounted, the patch panel **10** is capable of transitioning from a "flush-mounted" position (shown in Fig. 1) to an extended position (shown in Fig. 3) by sliding relative to the rack **26** on which the panel **10** is mounted. Sliding the panel **10** to the

extended position allows the bulkhead to be positioned within reach from a front of the rack **26** when another panel **10** is positioned directly above and in the flush-mounted position. In the exemplary embodiments, the mounting portion **22** is one or more elongated through holes and the panel attachment **28** is a bolt and nut, or clevis pin, whereby the panel attachment **28** slides within the mounting portion **22** so that the panels **10** are slidable relative to one another.

[25] Each of the first sides **16** may include a wire insertion portion **32** for extending optical wires or bundles of wires therethrough. In the exemplary embodiments, the wire insertion portion **32** is a U-shaped slot.

[26] Although the above exemplary embodiments have been described, they are not limiting, and it will be understood by those skilled in the art that the present invention should not be limited to the described exemplary aspects and embodiments, but that various changes and modifications can be made within the spirit and scope of the present invention.

CLAIMS

What is claimed is:

1. A patch panel comprising:

a housing comprising a base and a pair of first sides extending perpendicularly from the base;

wherein the base includes at least one wall attachment portion and the first sides each include a mounting portion.

2. The patch panel according to claim 1, wherein the wall attachment portion is a through hole.

3. The patch panel according to claim 1, wherein the mounting portion is a plurality of through holes with at least one of the through holes extending through each of the first sides.

4. The patch panel according to claim 1, further comprising a rack attachment bracket attached to the mounting portion of at least one of the first sides.

5. The patch panel according to claim 4, wherein the rack attachment bracket includes a slot and the rack mounting portion includes a projection that engages and slides along the slot.

6. The patch panel according to claim 1, further comprising a panel attachment attached to the mounting portion of at least one of the first sides.

7. The patch panel according to claim 1, wherein the housing further comprises a pair of second sides extending perpendicular to the base.

8. A patch panel assembly comprising:

a pair of panels each including a base and a pair of first sides extending perpendicularly from the base;

a wall attachment portion disposed on the base of each panel;

a mounting portion disposed on each of the first sides of each of the panels;

a rack mounting bracket attached to the mounting portion of one of the first sides of each of the panels; and

a panel attachment attached to the mounting portion of an other of the first sides of each of the panels and attaching the panels to one another.

9. The assembly according to claim 8, wherein the panel attachment is slidably attached the panels to one another.

10. The assembly according to claim 8, wherein the rack mounting bracket is slidably attached to the mounting portion of the one of the first sides of each of the panels.

11. The assembly according to claim 8, wherein the mounting portion is a plurality of through holes extending through the first side, and the wall attachment portion is a plurality of through holes.

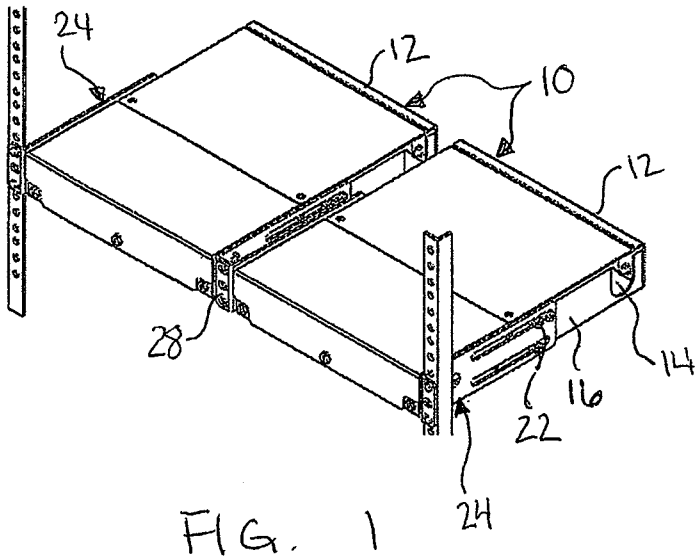


FIG. 1

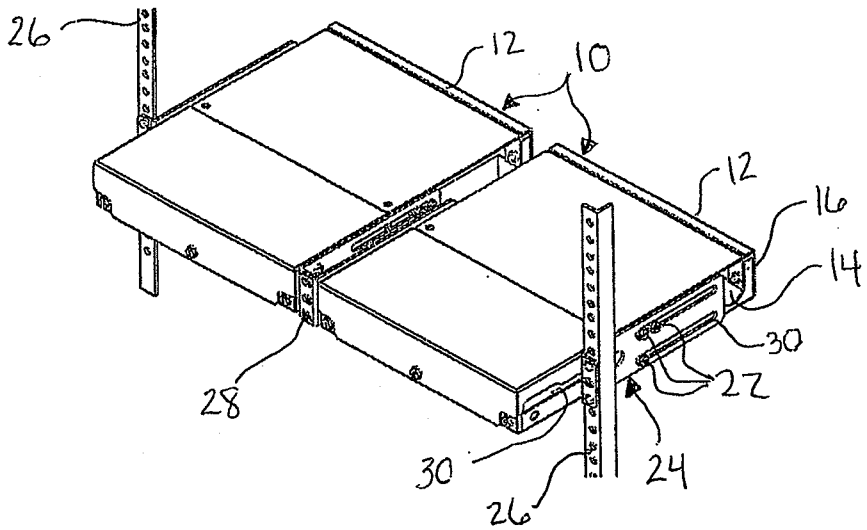


FIG. 2

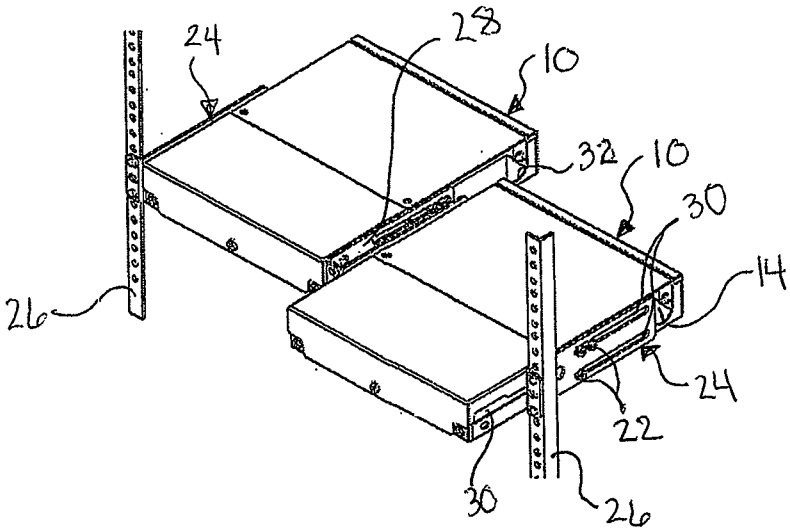


FIG. 3

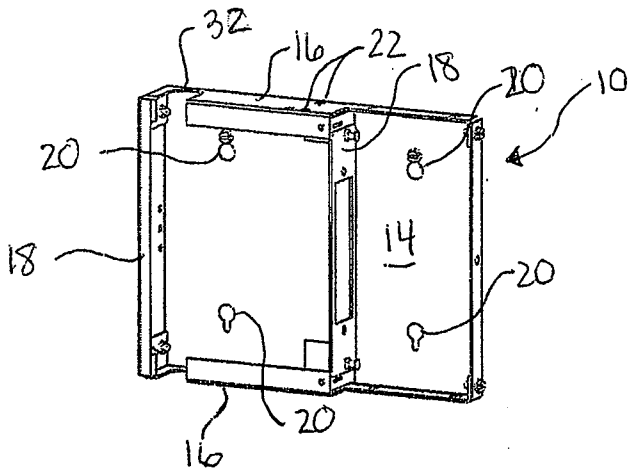


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/020075

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G02B 6/44 (2010.01)
USPC - 385/135
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - G02B 6/44 (2010.01)
USPC - 385/135

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
MicroPatent and Google Patents

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2006/0025010 A1 (SPITAELS et al) 02 February 2006 (02.02.2006) entire document	1-11
Y	US 7,087,840 B2 (HERRING et al) 08 August 2006 (08.08.2006) entire document	1-11
Y	US 6,785,459 B2 (SCHMIDT et al) 31 August 2004 (31.08.2004) entire document	5, 9-10

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
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Date of the actual completion of the international search	Date of mailing of the international search report
05 February 2010	26 FEB 2010
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774