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Patch Panel

The present invention relates to patch panels. Many electrical and electronic devices and systems have external ports by means of which they can communicate with other devices and systems. For example, computers can communicate with other computers via communication networks. In the past the interconnection which allows such communication generally comprised electrical wiring and cables, although there is now an increasing trend toward communication using optical fibers. In order that configurations can be changed, such wiring and cabling generally extends via a device known as a patch panel.

Patch panels are devices which are usually placed in racks and provide a cable management system for interconnecting large numbers of cables. Typically a rack will contain a series of patch panels disposed one above another in the rack with each patch panel having a front panel portion connected to opposite side walls of the rack. In some conventional patch panels the main structure of the panel itself has been constructed of metal and that metal portion has supported a rearwardly extending part which in the case of electrical connections has incorporated one or more electrical circuit boards.

The present invention is concerned with a patch panel which has been designed to provide a cable management system for interconnecting optical fibers and which is lighter and easier to construct than the conventional metal patch panels.

According to the present invention there is provided a patch panel for use as a or part of a cable management system for interconnecting optical fibers comprising a main structural part which is formed as a single plastics molding and defines at least one inlet for receiving an optical fiber cable or bundle, formations defining paths along which lengths of optical fiber can extend from said inlet, a surface for receiving one or more attachments such as a splice unit, and one or more front panel parts attachable to the front of the main structural unit and including one or more connector elements to which external optical fibers can be connected. The main structural



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part may be configured to define a path or paths around which lengths of optical fiber can extend.

The patch panel may include a cover or top member, which is attachable to lateral guide members which support the patch panel in a rack. A latch may be provided to latch the main structural unit to one or each guide member. The latch operation may be such that the main structural unit can be latched in either a forward or a rearward position.

The invention will be described now by way of example only, with particular reference to the accompanying drawings. In the drawings:

Figure 1 is a perspective view of a patch panel in accordance with an embodiment of the present invention;

Figure 2 is a view similar to Figure 1 in which the cover of the panel has been removed, and

Figures 3A and 3B are side sectional views on the lines III-III of Figure 2 illustrating the latch operation.

The patch panel shown in Figure 2 of the drawings includes a main structural part shown generally at (10) which is formed from plastics material as a single molding. The molding is formed to provide the following structural formations. The main structural unit has a rear upstanding wall (11) at opposite ends of which are provided inlets (12) and (14) which are defined between a pair of spaced wall portions (15), (16), (17) and (18). At the inner end of the inlet (14) there are facing molded portions (20) and (21) which define grooves which can receive a gland plate (22). An optical fiber cable can be fed in through the inlet (14) and through an opening in the gland plate (22). It will be appreciated that a similar plate can be provided for the inlet (12), although this is not shown in the drawings.

The rear wall (11) has angled portions (24) and (25) which incorporate push-out portions (26, 27). These can be used when it is necessary to provide additional inlets for further optical fiber cables or bundles.

Slightly inwardly of each inlet (12, 14) there is provided a formation shown at (30, 31). These formations have a central through aperture and can receive a self-tapping screw to act as a

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restraint point for a kevlar member which can be used to secure an optical fiber cable.

The bottom or base of the main structural unit includes a central surface shown generally at (35). This surface (35) can receive attachments such as splice units (34) which can be clipped in position on the surface. Recessed regions (36) and (37) are disposed on opposite sides of the central surface (35) and ramps (38) and (39) provide a smooth transition between the surface (35) and respective regions (36, 37). Each recessed area (36, 37) has formed therein a disc like hub (40), the upper surface of which has a star-shaped section (44). It will be seen that there is an annular area within each recess (36, 37) around the hub (40) and this annular area can be used to accommodate optical fibers as will be described later. It will also be seen that there is a ramp (46) between each recessed area (36, 37) and the respective inlet (12, 14). The upper surface of each star-shaped section (44) has attachment points (45) to which additional units can be fitted.

Further recessed sections are provided forwardly and rearwardly of the central surface (35) and these are indicated by reference numerals (47) and (48). These provide channels along which optical fibers can extend.

Projections (49) as well as the points on the star shaped section (44) act as retaining members for fibers which are wound around the main structural unit.

The front of the main structural unit is configured so that it can receive panel pieces shown by reference numerals (50 to 53). These panel pieces are so shaped that they can be clipped to the front wall of main structural unit (10). The panel pieces incorporate optical fiber connector elements which can receive mating connector elements provided on the end of optical fibers extending from a variety of locations.

The patch panel can be supported within a rack by means of laterally disposed elongate guide elements (60, 61). These guide elements are carried within a rack and supported on tracks secured to the wall of the rack. The main structural unit of the patch panel can be latched relative to each guide member by means of a latch shown generally at (65). The latch (65) comprises a pivotable

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member (66) which is pivotally carried on a side wall of the main structural unit and has an elongate limb (67) from which projects formation (68). As shown in Figures 3A and 3B the projection (68) can engage one of two ribs (69, 70) formed on a lower part of each lateral guide. This enables the patch panel to be latched either in the position shown in Figure 3A or the position shown in Figure 3B. Figure 3A shows a forward position and Figure 3B shows a rearward position of the patch panel. The pivotable member (66) can be retained in its latching position by a push-in element (72).

10 The patch panel is completed by a cover (75) which is located in position by projections on each lateral guide extending through slots (76) formed in the cover.

In use of the patch panel an optical fiber cable can be fed in through, for example, the inlet (14) and passed through the gland plate (22) and down the ramp (46). The fibers can then be wound around the annular space around the hub (40) in the recess (37) as many times as is necessary and up on to the surface (35). The fibers can then be spliced in the splice units (34) and connected to other fibers which can then be wound around the hub (40) in the recess (36) and if necessary fed through channels (47) and (48) to provide as much slack or excess length of fiber as is deemed necessary. Ultimately those fibers are led to the panel pieces (50, 51, 52, 53) where they can be joined to the optical fiber connector elements carried on those panels.

25 The present embodiment therefore provides a relatively light patch panel which is easy to produce since the main structural unit can be formed as a single molding. It will be appreciated that the panel is flexible in that units additional to the splice units (34), or alternative to the splice units can be employed on the surface (35). For example, it is possible to mount a breakout unit below the splice unit into which the incoming fibers fed through the inlet (14) can be connected prior to being wound around and led into the splice unit.

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CLAIMS

1. A patch panel for use as a cable management system or as part of such a system for the connection of optical fibers, comprising

a main structural part (10), which is formed as a single plastics molding and with
at least one inlet (12, 14) for receiving an optical fiber cable or bundle,

formations, which define paths along which lengths of optical fiber can extend from the inlet, the formations comprising clearances (36, 37), which are formed with a hub (40), and ramps (46, 38, 39), and

to [sic] a surface (35) is formed for receiving one or more attachments, such as for example a splice unit (34), and

one or more front panel parts (50-53), which can be attached to the front side of the main structural unit (10) and contain one or more connector elements, to which external optical fibers can be connected.
2. The patch panel as claimed in claim 1, the hub (40) having a star-shaped portion and points on the star-shaped portion acting as holding elements.
3. The patch panel as claimed in claim 1 or 2, the main structural part (10) being formed with channels (47, 48), in which the optical fiber cables or bundles can be guided.
4. The patch panel as claimed in one of claims 1 to 3, with a covering or cover element (75), which can be attached to lateral guide elements (60, 61), which support the patch panel in a rack.

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5. The patch panel as claimed in claim 4, with a locking mechanism (65), which is provided in order to lock the main structural unit to one or each guide element.
6. The patch panel as claimed in claim 5, the locking operation being such that the main structural unit can be locked either in a forward position or a rearward position.