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(54) Benævnelse: **SPLEJSEMODUL MED PATCHENHED**

(56) Fremdragne publikationer:

**EP-A1- 2 669 726**
**EP-A1- 2 788 808**
**EP-B1- 2 409 192**
**WO-A1-2010/085388**
**DE-U1- 20 115 940**
**US-A- 5 100 221**
**US-A1- 2015 093 089**
**US-A1- 2015 346 449**

The invention relates to a splice module for optical fibre cables. Such optical fibre cables are also known as glass fibre cables.

Optical fibre cables serve to transfer signals at high transfer rates and/or with a high spatial range and are increasingly being used. In particular, optical fibre cable networks are being routed right through to the consumer or even to the end device in the home or office. With the increasing expansion of optical fibre cable networks, the task of connecting optical fibre cables to each other is an increasingly frequent one.

This involves attaching the individual fibres to each other using a known technology, creating what are referred to as splice points that are likewise arranged in a familiar manner and housed so that they are both accessible and protected. There are what are referred to as splice modules, in which typically a plurality (e.g. twelve or a multiple of twelve) of glass fibres in cables are spliced each with an individual glass fibre in respective splice cassettes and routed to detachable connecting elements (such as plug-in connectors and couplings) with short connecting fibres (pigtails). There, optical fibre cables with connecting elements (such as plug-in connectors) can be used to continue the glass fibre connections. When used below, the term optical fibre cable will therefore refer to a type of cable relating to a splice module of this type and not to a "glass fibre cable" buried underneath a road, for example, comprising a thick and diverse bundle of individual fibres.

To allow accessibility to the individual splice points and patch points, known splice modules typically have a moving pull-out similar to a drawer and a stationary mount. In the case of special variants, the pull-out is not pulled out translationally, but is pulled out around a rotating axis. Reference can be made in this respect to EP 2 669 726 A1. This prior art also shows a patch unit on a front side of the splice module shown with a total of 2 x 12 detachable connectors.

DE 201 15 940 U1 shows a vertical row of patch points and, next to this, vertical rows of openings on a front plate in front of a set of cassettes which house, among other things, splice points. This document thus discloses the preamble to claim 1. It should be possible to adapt the front plate with the patch points and openings flexibly and effectively to the respective needs. Pigtail cables are mentioned in connection with inserting optical waveguides in bundled wires.

EP 2 788 808 A1 shows a splice module with two splice cassettes, namely on top of and under a plate, in a housing, wherein the housing has universally usable slots between vertical struts on opposite sides. Connectors or continuous cables held in place by clamping devices can be inserted into these slots as desired.

WO 2010/085388 A1 shows a rack made from horizontal patch systems sitting one on top of the other with two supports for each patch system and a patch splice arrangement on each support. To increase the number of splice points, two rows, one behind the other, of respective clamping points for connectors with gaps in between these are provided in these patch splice arrangements, wherein cables can run through each of the gaps to a patch point in front of or behind the gap.

Further information about the prior art can be found in US 2015/093089 A1, US 5 100 221 A, EP 2 409 192 B1 and EP 2 669 726 A1.

In particular, US 2015/346449 A1 shows a splice module with pre-installed pigtail cables and fixtures for two plug-in connections, although not for continuous, uninterrupted cables.

The aim of the invention is to specify a functional and practical improvement for routing optical fibre cables.

This aim is solved with a splice module for optical fibre cables with a multiplicity of splice point receivers in the splice module and a patch unit having a multiplicity of patch points, each with a detachable connection device, for a respective optical fibre cable, wherein the patch unit also has passage points with no detachable connection devices, which are instead provided for the passage of one continuous optical fibre cable through a respective opening of each passage point, and the passage points and patch points are each arranged directly adjacent to each other and in the sense that, starting from a patch point and proceeding relative to a direction transverse to the local direction of the optical fibre cable, not all the other patch points are closer than the nearest passage point, so there is at least one patch point which is further away than such a nearest passage point, wherein detachable connecting elements for pigtail cables leading to the respective splice point receivers are present at the patch points, which connecting elements are configured to create connections with complementary detachable connecting elements on the respective patch cables at the patch points, characterised in that the pigtail cables are already present and connect the respective patch point to a respective one of the splice point receivers in which no splice point has yet been formed or received, and, in an improved configuration, with the various dependent claims. Furthermore, the invention also relates to a splice module stack in accordance with claim 12, a distribution cabinet in accordance with claim 13 with a plurality of such splice modules and finally an advantageous use in accordance with claim 15.

In accordance with the invention, directly adjacent passage points are respectively provided for the individual patch points and also belong to the patch unit. There are no detachable connections at these passage points, merely openings through which the glass fibre cables are or can be continuously routed.

It has in fact transpired that not only is there still a need for a passage of non-interrupted optical fibre cables, but that installing the cables becomes particularly easy and manageable if such continuous cables sit as close as possible to an associated patch point or if a corresponding opening is present as close as possible to such a patch point. In this case, there is the option of disconnecting a cable during installation and reconnecting it to a patch point using the usual detachable connecting elements, in particular plug-in connectors. However, the cable can also be routed through the passage point without being disconnected.

In particular, a direct spatial relationship between the patch points and the passage points is maintained, so that even in the event of subsequent changes, such as the disconnection of an initially non-disconnected optical fibre cable, an adjacent patch point is available (provided that it is kept vacant). The spatial arrangement of the cables should therefore be changed as little as possible and the laying will remain clear and manageable even in the event of subsequent changes. The same applies conversely if initially disconnected optical fibre cables that are connected to a patch point are to be replaced with continuous optical fibre cables.

For example, customer-specific preferences may come into play during installation. A technical company or a bank branch as a customer may prefer to avoid using patch points (plug-in connections) to increase security, for example, whereas private households, for example, as customers are assigned patch points due to the ease with which connections can be swapped over, to allow easier switching from one telecommunications provider to another, for example. If, for example, a commercial building is converted into a residential building or is relet to tenants with different requirements, the system in accordance with the invention makes it very easy for the respective preferences to be taken into account.

Furthermore, what are known as duplex patch points can be used as part of the invention. Particularly small detachable connecting elements (plug-in elements) which fit together in pairs into a snap-fit receptacle (or other receptacle) for a (conventional) connecting element are used for this. Two patch points are thus housed on the surface actually intended for a single patch point, which means that the number of individual cables can be doubled. However, the cables are still routed individually and remain connected to the patch points. In such cases, the number of passage points is preferably doubled accordingly.

“Directly adjacent” means that, starting from a patch point (and proceeding relative to a direction transverse to the local direction of the optical fibre cable), there may be other patch points which are closer than the nearest passage points, but that not all other patch points are closer than the nearest passage point. There is at least one patch point which is further away.

Preferably no more than 10 and particularly preferably no more than 9, 8, 7, 6, 5, 4, 2 or even only one patch point should be closer than the nearest passage point. The same preferably applies conversely, in other words starting from a passage point, and preferably applies to all patch points and/or to all passage points.

The distance between a passage point and the nearest patch point and vice versa (in the direction perpendicular to the local direction of the optical fibre cable) should preferably be as small as possible, including relative to a dimension not dependent on the distance to the nearest homogeneous point. This dimension could be a typical diameter of a detachable connecting element in the specified direction. If, for example, the connector is out of round, an average diameter is meant. Distances of no more than 5 times such diameters and preferably no more than 4 times or even no more than 3 times such diameters are preferred. The centre of the optical fibre cable is regarded as the position in each case.

Furthermore, it is preferred that the patch points and passage points are present in a 1:1 correspondence. This is initially based on the direct adjacency described and therefore means that (effectively in a bijective relationship) a directly adjacent (as described above) passage point should be associated to each patch point and vice versa. This also means that the patch points and passage points are present in equal numbers.

The invention also produces a patch point as a result of a connecting element already inserted from the side of the splice point receiver, but still detachable, for example a plug-in element, namely at the end of a pigtail facing the patch unit. This element can be inserted into a corresponding receptacle (e.g. a snap-fit receptacle) on the patch unit, thereby forming a patch point there into which a complementary connecting element of a patch cable can be inserted from the other side. In accordance with the invention, the pigtail cable is therefore already present and connects the patch point to a corresponding splice cassette in which a splice point has not actually yet been formed or received.

The user uses such a splice module by creating the splice point on one side at the corresponding end of the pigtail which is received in the splice cassette (and the connected optical fibre cable proceeds out from the splice cassette); the user then further connects a patch cable at the corresponding patch point from the other side. If preferred, the user can instead feed a patch cable through the corresponding passage point and, with this, form and deposit the splice point. The pigtail can then lie unused to, at a later point in time, facilitate the conceivable switch to the patch point described.

A preferred arrangement of the patch points and passage points is configured in rows, namely with at least one row for each type. These can run parallel to each other, wherein a relatively small distance between the rows is preferred. The preferred distance criteria for this correspond to the criteria (as a distance between rows in this case) specified above for the distance between the passage point and the nearest patch point in relation to the diameter of the connecting element. In particular, there can be a direct association between passage points and patch points positioned merely in accordance with the offset between the rows but otherwise positioned analogously (in other words with an offset of the rows perpendicular to the respective direction of the rows).

A further option is an alternating sequence, whereby the passage points and patch points alternate along a row, preferably alternating singly, but also possibly alternating in pairs. Such rows can also be present in a multiplicity of rows next to each other, wherein the respective arrangement of the passage points and the patch points within the rows (taking account of the offset transverse to the direction of the rows) is preferably identical for each row.

Clamp inserts can be provided for the passage points, in other words clamping bodies that are used to hold a continuous optical fibre cable clamped in the opening of a passage point. The clamping bodies and/or the connecting elements can include, for example, injection-moulded parts, zinc die-cast parts, carbon fibre parts etc.

For example, a clamping body in accordance with EP 3 182 186 can be used. Such a cable retention element has external elastic snap-fit elements on a basic body that can engage on the front plate. Furthermore, a cylindrical cable guide tube is provided in the basic body and protrudes out from the ends. The basic body with the snap-fit elements and/or the tube can be configured as a single piece, for example as an injection-moulded element, and for the purpose of simplification at least one and preferably two or three centre planes can be symmetrical. The body can, for example, fit a standardised receptacle of an LC, SC or E-2000 connector.

It has already been mentioned above that what are known as duplex patch points can be used. In this case, it is appropriate to provide correspondingly smaller clamping inserts that also fit in pairs into a corresponding slot, thereby providing the necessary doubling of the passage points.

The patch unit is preferably attached to a front plate, for example in the form of detachable connecting elements and, where necessary, clamping elements for passage points, which are inserted into openings in the front plate. The front plate is preferably provided at an angle towards a mounting plate and can be configured either as a single piece together with this mounting plate or mounted on the mounting plate. The mounting plate in turn supports the splice point receivers.

The front plate is preferably provided near to or on an edge of the mounting plate and such that it is directly accessible (externally) from the side of this edge and is not covered by a cover plate, as shown, for example, with reference number 22 in the previously cited EP 2 669 726 A1. Such cover plates are otherwise also found in the prior art, but they make accessing the patch unit harder.

A preferred embodiment provides for the splice module forming a revolving drawer, in other words a structural unit which can be rotated around a rotating axis and out of a further assembly, said structural unit comprising at least the supporting plate with the splice point receivers, the front plate and the patch unit. The rotating axis preferably runs vertically to the mounting plate and preferably through a front corner, relative to the patch unit (in other words adjacent to the patch unit), of the mounting plate. In addition to the exemplary embodiment, reference can be made to EP 2 669 726 A1.

This also shows what is provided in the context at hand, namely the accommodation of the individual splice point receivers in at least one cassette, wherein such cassettes are in turn preferably present in the splice module as a stacked plurality of cassettes. Each of the splice cassettes preferably contains a plurality of splice point receivers, such as two (in/out) or four (ditto with reserve receiver slots). For example, a cassette stack can contain six such cassettes.

Furthermore, a plurality of splice cassette stacks are provided next to each other (relative to a direction perpendicular to the direction of the stack and therefore offset on the plane of the mounting plate), for example two stacks each with six cassettes. Such splice modules can in turn be stacked to form larger structural units, which in turn can be provided as a plurality of splice module stacks in a distribution cabinet.

When using a splice module in accordance with the invention, the optical fibre cables are preferably each routed either through a patch point or through a directly adjacent passage point, but a respective optical fibre cable should not be routed through both. This means that when using the passage point the patch point remains vacant for later use and vice versa. It is therefore possible in particular to route cables continuously in the first instance and then later disconnect them and reconnect them to a patch point with minimal disruption to the arrangement system and minimal effort for the installer. As already explained, previously disconnected optical fibre cables can of course later be replaced with continuous cables, for example to address specific safety needs of a customer, wherein the cables will of course then need to be rethreaded.

The invention is explained in further detail below on the basis of an exemplary embodiment, where:

Figure 1 shows a perspective view of a stack of splice modules according to the invention one on top of the other;

Figure 2 shows the stack of splice modules from Figure 1, wherein one splice module is rotated forwards and to the right;

Figure 3 shows an analogous view, but with a slightly rotated perspective;

Figure 4 shows a view analogous to Figure 2, but with a splice module rotated out around a different rotating axis;

Figure 5 shows a view analogous to Figure 1, but with two rotating axis pegs drawn on for illustration purposes;

Figure 6 shows a perspective view of one of the splice modules from the stack in accordance with Figures 1 to 5;

Figure 7 shows a part of a patch unit from the splice module from Figure 6;

Figure 8 shows an analogous view to Figure 7, but with inserted mounts for plug-in connecting elements and two such plug-in connecting elements each with an attached optical fibre cable;

Figure 9 shows a further such view with fully populated patch points with respective plug-in connecting elements;

Figure 10 shows an analogous view to Figure 9, wherein a patch point is cable-free in this case and a cable is instead routed through a directly adjacent passage point;

Figure 11 shows an analogous view to Figure 10, wherein the cable in the passage point is held in place by a clamping element.

Figure 1 shows a perspective representation from above, obliquely to the right at the front, of a splice module stack of four splice modules, each arranged vertically, stacked vertically one on top of the other. In the splice module stack, the four splice modules are held together by a sheet metal frame with an upper plate 1, a rear panel with lateral mounting lugs 2 and an invisible lower panel similar to the wall 1. Fig. 1 already shows that the splice module stack and the individual splice modules in this stack are configured to be mirror-symmetrical with respect to a vertical centre plane (running from the front to the rear), in other words they have a right-left symmetry.

Figure 2 shows the splice module stack from Figure 1, wherein the second splice module 3 from the top is swivelled out around a rotating axis 4 situated to the front and right (cf. Figure 5), in other words rotated anti-clockwise as seen from above and by approximately 90°. The other three splice modules are configured analogously and can be swivelled analogously, all around this same rotating axis 4.

The splice module 3 has a mounting plate 5 lying horizontally and made from sheet metal, on the rear part (based on the state as inserted) of which mounting plate two splice cassette stacks lying next to each other mirror-symmetrically are held in place, each stack containing six splice cassettes 6. The splice cassettes 6 in the stacks can be folded up around an axis lying transversely at the rear and thus allow access to cassettes located further down. Each stack is configured with inherent mirror symmetry through its centre relative to another centre plane (parallel to the main plane of symmetry) and therefore also with mirror symmetry relative to each other (from stack to stack). Four splice points can be received in each cassette 6 of the two stacks, wherein one cassette is generally associated to each connection, such that two splice point receivers (in/out) are populated and a further two receivers are kept vacant as reserve receivers.

The sheet metal of the mounting plate 5 is bent upwards by 90° at the front, thus forming a front plate 13 that runs transversely. This front plate contains cut-outs, each rectangular and mirror-symmetrical relative to the other, into which cut-outs inserts 7 are inserted in accordance with Figures 7 ff. (injection-moulded parts), see also Figure 6.

These inserts 7 are explained in further detail in conjunction with Figures 7 ff. They are held in place by means of latching projections, clearly visible at the top of Figure 7, set in corresponding recesses in the sheet metal front plate 13.

As can be seen in Figure 9, the inserts are used to house the patch points 18 already described at the outset, in other words to provide the transition between the pigtails and the patch cables proceeding from these. These cables are not shown in Figures 1 to 7. However, the pigtails, as established, for example, from the applications cited at the outset, run within the splice module 3 and via the mounting plate 5 to the individual splice cassettes 6 in the two stacks, wherein there is a corresponding association between the patch points 18 and the splice cassettes (two patch points 18 per splice cassette).

As the figures illustrate, it is completely immaterial whether the cables are laid in a certain arrangement or in a right-left inverted arrangement, as the splice module 3 and all other splice modules are in fact configured with the corresponding symmetry. The same applies to the entire stack shown in the figures. It also applies to the rotatability evident in Figures 2 and 3, which in accordance with Figure 4 can be solved with a rotating axis at the front and to the left, to which end in accordance with Figure 5 a rotating axis peg 8 shown in this figure underneath the splice module stack is inserted into the corresponding holes on the right or left.

It is therefore particularly possible to route the optical fibre cables 9 proceeding out to the front in accordance with Figures 9 to 11 to the right or left in front of the front plate 13. To this end, elements 20 and 11, created as injection-moulded plastic parts, are provided in front of the front plate 13, namely a central frame-like clip 20 which can encompass optical fibre cables 9 emanating from an insert 7 on the right which are diverted to the left, or vice versa. For this purpose, the clip 20 is flexible and allows the individual cables to be pulled through the oblique slot included in the drawing at the front. The optical fibre cables 9 are then routed together through a double-bent channel in a lateral element 11 which is provided symmetrically and bilaterally and, depending on the individual choice, is only used on one side. It is normally preferred for the optical fibre cables 9 to be routed close to the rotating axis 4, in other words through the right-hand element 11 for a right-hand rotating axis and through the left-hand element 11 for a left-hand rotating axis. Figures 1 to 5 further show fan-shaped elements 12, also designed as injection-moulded plastic parts, on the right and left on the individual splice modules for routing the optical fibre cables 9 downstream from the elements 11.

The internal configuration of the individual splice modules, such as module 3, also has right-left symmetry, namely relative to the front plate 13, mounting plate 5 and the stacks of splice cassettes 6.

Figure 6 clearly shows that two inserts 7 in accordance with Figure 7 are engaged in the front plate 13 to the left and right of the clip 10. At the bottom of these inserts there is a horizontal row of a total of 12 slots for receptacles 14 for plug-in connections, see Figure 8, which in turn lock in place in the inserts 7. The plug-in connecting elements 15 and 16 provided on the cables 9 and 10 can be inserted into these receptacles 14 for plug-in connections, wherein in the typical condition on delivery the element 16 inserted from the rear (in accordance with Figure 8 and the typical user perspective) is held in place in such an insert 14 and thus forms a socket for the element 15. All 12 slots can be occupied in this form, thereby producing a row of patch points 18, see Figure 9. The pigtails 10 lead, for example in pairs, to one of the splice cassettes 6 per pigtail on their side (right or left).

If a cable is to be disconnected at a later time or is not to be disconnected right from the outset, as in the case of cable 17 in Figure 10, for example, it can be pulled through one of the passage points 19 via the patch points 18, as shown in Figures 10 and 11. A clamping element 20 can then be used for, on the one hand, holding the cable in place in the passage point and, on the other hand, clamping the cable 17 to provide strain relief. A protective cover of the cable 17 present on the outside of the splice module 3 is wedged in the clamping element 20 and not fed any further into the splice module 3. With regard to this clamping element 20, reference can be made to the previously cited EP 3 182 186. In particular, it is possible to route the cables 17 (or certain cables) continuously to start with and then only retrospectively replace them with disconnected cables, or disconnect the cables, and thus use plug-in patch points 18. This corresponds to a step from Figure 11 to Figure 9.

The passage points 19, optionally with the elements 20, are arranged directly above the associated patch points 18 and are therefore immediately adjacent to these. The typical distance between the centres of the respective cables is in the range of an (averaged) diameter of a plug-in element 15 or 16 (as seen vertically). It is of course conceivable that the two horizontal rows of patch points 18 and passage points 19 could be replaced with, for example, two patch points lying one above the other and next to this two passage points, one above the other, then two patch points again, one above the other, and so on. That would not have a material impact on the direct contiguity.

Both variants ensure that an alternative passage point (or patch point) for a previously used patch point (or passage point) can be found for a cable to be changed (see Figures 9 and 11) with minimal changes to the rest of the cable routing, so that the arrangement as a whole remains as manageable as possible and does not have to be resorted.

Figures 1 to 6 clearly show, compared to the cited documents from the prior art, that the patch points 18 and passage points 19 in the front plate 13 of the splice modules are optimally accessible from the front and in particular do not disturb any of the other covers (apart, of course, from a cabinet door or similar). Cover plates of a different design were widely used in the prior art, but these make access for resorting and/or changing from patched to continuous optical fibre cables more difficult.

Furthermore, it is easy to imagine on the basis of the respective last illustrations and corresponding explanations in the cited documents how several of the splice module stacks shown in Figures 1 to 5 might be housed in a distribution cabinet, stacked one on top of the other. The distribution cabinet can, but does not have to be, configured with right-left symmetry. Even with a non-symmetrical configuration, it can be practical to change the limit stop (rotating axis position) of a distribution cabinet door.

Regardless of this, it is certainly hugely beneficial to be able to choose, dependent on the individual structural conditions, whether the looms of optical fibre cables are routed to the patch points and to the splice points on the right or left, and thus to be able to customise the routing in the splice modules.

**Patentkrav**

1. Splejsemodul (3) til lyslederkabler, lyslederkabel, (9,10,17) med

et flertal af splejsesteder i splejsemodulet (3) og

en patchenhed, der har et flertal af patchsteder (18) med hver især en løsbar forbindelsesanordning (14) til et pågældende lyslederkabel (9),

hvor patchenheden derudover har gennemgangssteder (19) uden løsbare forbindelsesanordninger, hvilke i stedet for gennemgangen for hvert gennemgående lyslederkabel (17) er tilsigtet ved hjælp af en passende åbning ved hvert gennemgangssted (19)

og gennemgangsstederne (19) og patchstederne (18) hver især er anbragt ved siden af hinanden på en sådan måde, at med udgangspunkt i et patchsted (18) vedrørende en retning på tværs i forhold til den lokale lyslederkabelretning er ikke alle øvrige patchsteder (18) nærmere end det næste gennemgangssted (19), der er altså mindst et patchsted (18), der er længere væk end et næste gennemgangssted (19), hvor der ved patchstederne (18) foreligger løsbare tilslutningselementer (16) fra pigtail-kabler (10), der fører til de pågældende splejsesteder, og som er konstrueret til forbindelser med komplementære løsbare tilslutningselementer (15) fra pågældende patchkabler (9) ved patchstederne (18),

kendetegnet ved, at pigtail-kablerne (10) allerede foreligger og det pågældende patchsted (18) forbindes med en af de pågældende splejsesteder, hvor der endnu ikke er dannet og gemt noget splejsested.

2. Splejsemodul (3) ifølge krav 1, hvor afstanden for gennemgangsstederne (19) og patchstederne (18) ved siden af hinanden i en retning lodret i forhold til lyslederkablets (9) lokale retning og vedrørende positionen for midten af lyslederkablerne højst er fem diametre af patchstedernes (18) forbindelsesanordning (14).

3. Splejsemodul (3) ifølge et af foregående krav, hvor patchstederne (18) og gennemgangsstederne (19) foreligger i et 1:1-sidestykke.

4. Splejsemodul (3) ifølge et af foregående krav, hvor patchstederne (18) og gennemgangsstederne (19) i horisontale og i forhold til hinanden parallelle rækker er tildelt mindst en række patchsteder (18) og mindst en række gennemgangssteder (19).

5. Splejsemodul ifølge et af kravene 1 til 3, hvor patchstederne og gennemgangsstederne er tildelt i skiftevis rækkefølge, så patchsteder og gennemgangssteder langs en række skiftes.

6. Splejsemodul (3) ifølge et af foregående krav med en klemmeindsats (20) for at klemme et gennemgående lyslederkabel (17) i et gennemgangssted (19).

7. Splejsemodul (3) ifølge et af foregående krav med en bærerplade (5), der bærer splejsestederne, og en frontplade (13), der vinklet i forhold til bærerpladen (5) er forbundet med denne og er anbragt ved patchenheden.

8. Splejsemodul (3) ifølge krav 7, hvor frontpladen (13) med patchenheden er tilsigtet ved siden af bærerpladens (5) kant eller i forhold til en kant af samme og er tilgængelig direkte fra siden af denne kant, altså især ikke skjules af afdækningspladen.

9. Splejsemodul (3) ifølge krav 7 eller 8, hvor bærerpladen (5) sammen med splejsestederne, frontpladen (13) og patchenheden danner en drejeenhed, der kan drejes omkring en drejeakse (4), der forløber vertikalt i forhold til bærerpladen (5).

10. Splejsemodul (3) ifølge et af foregående krav, hvor splejsestederne hver især er tilsigtet som et flertal af splejsesteder i de pågældende splejsekassetter (6) og kassetterne (6) i et flertal er tilsigtet stablet i splejsemodulet (3).

11. Splejsemodul (3) ifølge krav 10, hvor mindst to stabler splejsekassetter (6) i en retning lodret i forhold til stabelretningen er tilsigtet ved siden af hinanden.

12. Splejsemodulstabel fra et flertal af splejsemoduler (3), der er stablet over hinanden ifølge et af de foregående krav.

13. Fordelerskab med et flertal af splejsemodulstabler ifølge krav 12.

14. Fordelerskab ifølge krav 13 med et flertal af splejsemoduler (3) ifølge krav 9, valgfrit kombineret med krav 10 eller 11, hvilke splejsemoduler (3) ifølge krav 12 er stablet over hinanden på en måde til et flertal af splejsemodulstabler, hvor splejsemodulerne (3) er stablet i

splejsemodulstabler på den ene side og splejsemodulstabler på den anden side i en retning af drejeaksen (4).

15. Anvendelse af et splejsemodul (3) ifølge et af kravene 1 til 11 eller splejsemodulstablen ifølge krav 12, hvor lyslederkablerne (9, 10, 17) alternativt føres igennem de pågældende patchsteder (18) eller gennemgangsstederne (19) ved siden af, hvor et gennemgangssted (19) ved siden af i tilfælde af et patchsted (18) forbliver uden kabel og omvendt.

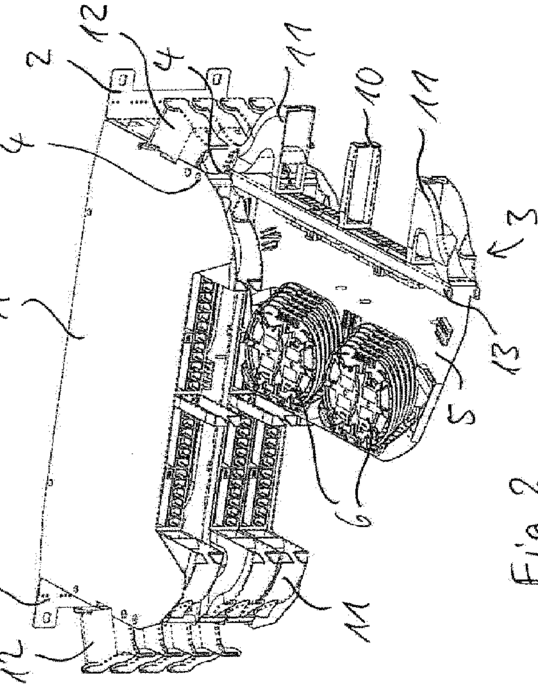


Fig. 2

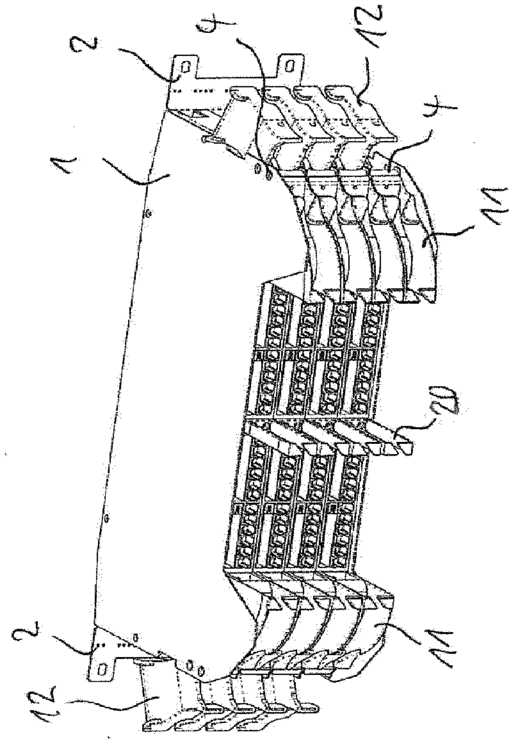


Fig. 1

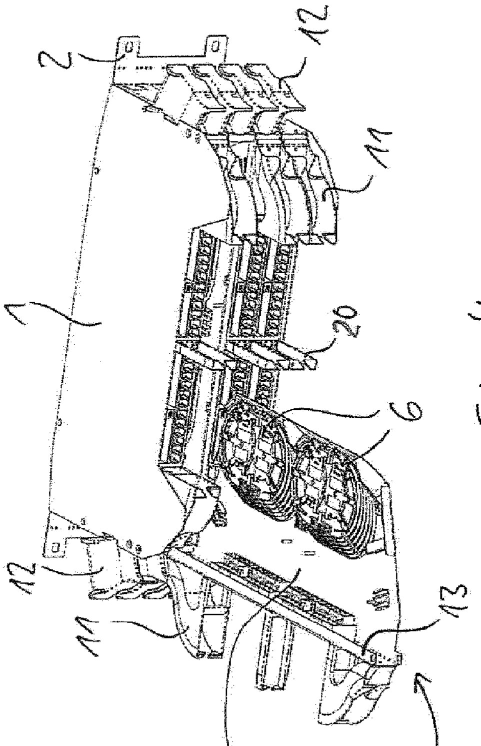


Fig. 4

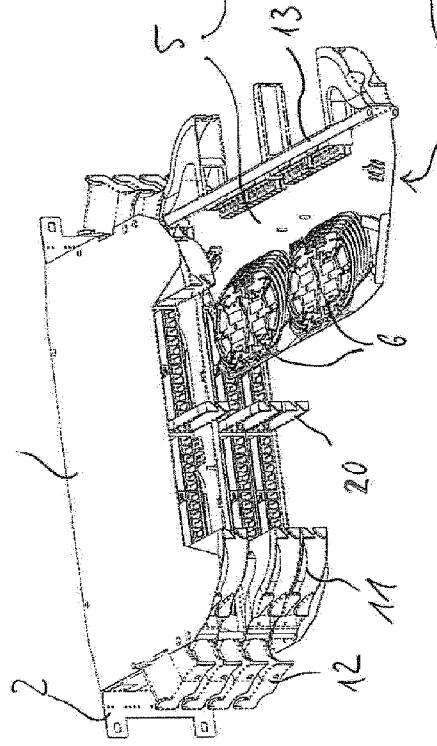


Fig. 3

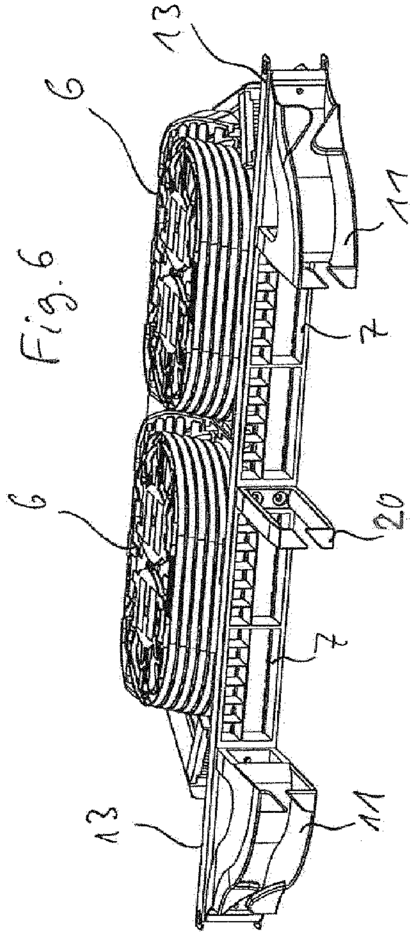


Fig. 6

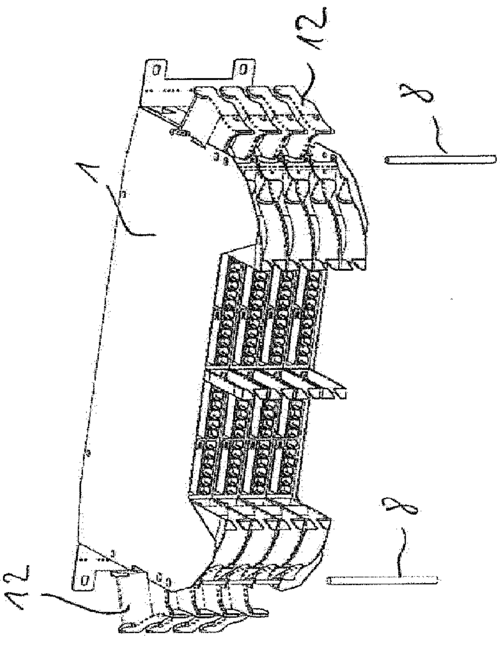


Fig. 5

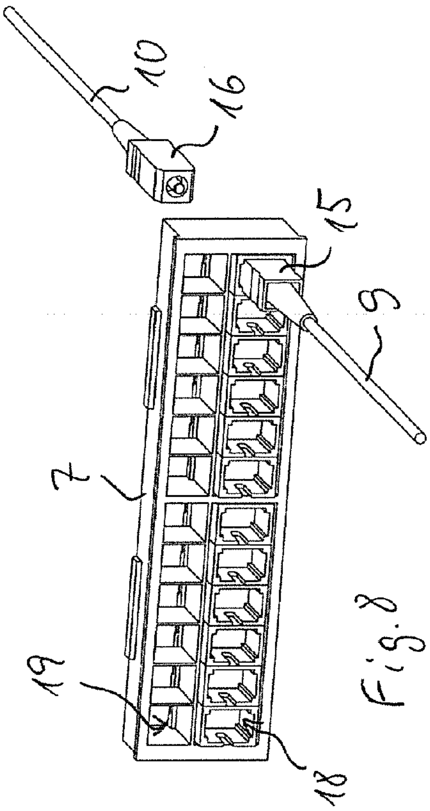


Fig. 8

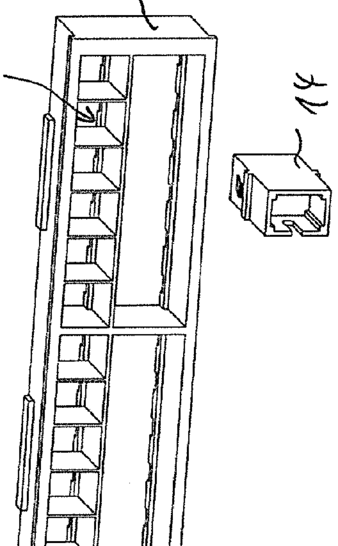


Fig. 7

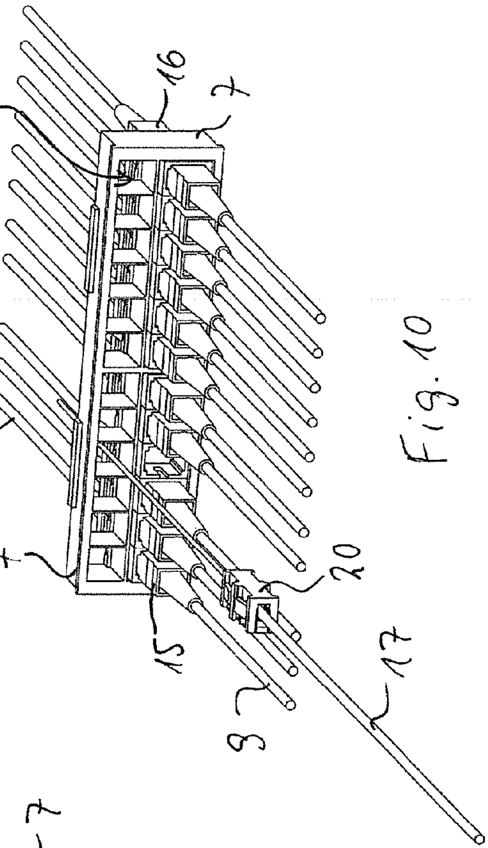


Fig. 10

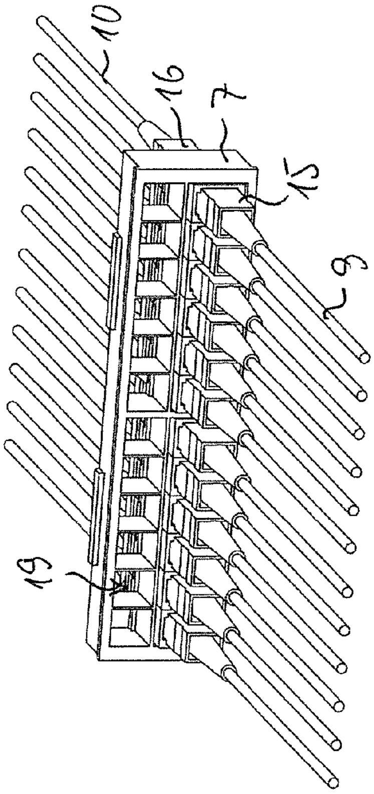


Fig. 9

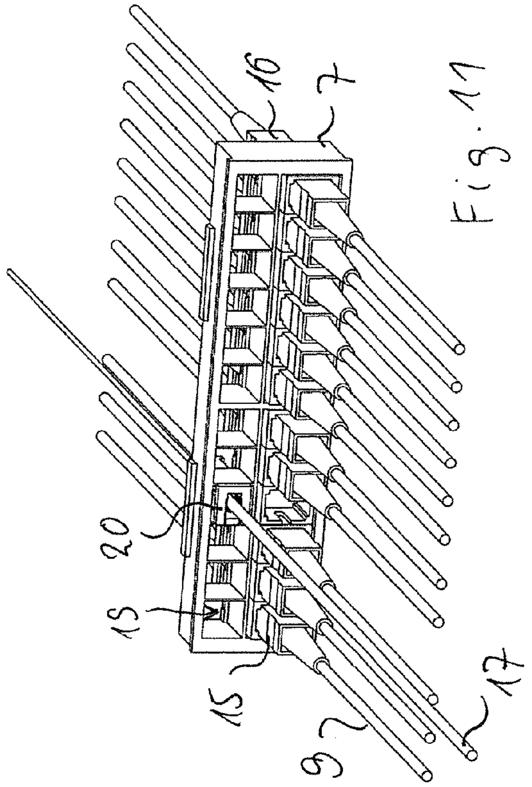


Fig. 11