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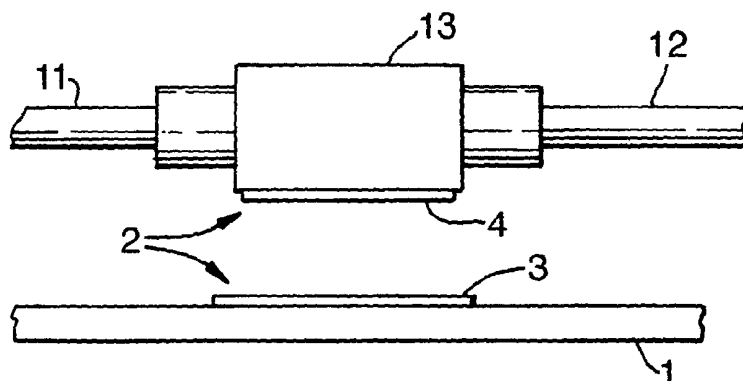
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(54) Title: CABLE CONTAINER HAVING IMPROVED FASTENING MEANS



(57) Abstract: A container (1) such as a patching tray for accommodating incoming cables (11), outgoing cables (12) and connectors (13) connecting the incoming and outgoing cables is provided with fastening means (2) for fastening the connectors (13) to the bottom of the container. According to the invention, the fastening means (2) are constituted by at least a first fastening pad (3) fixed to the container (1) and second fastening pads (4) fixed to the individual connectors (13), the fastening pads (3, 4) being designed so as to provide a releasable bond. Preferably, the pads together constitute a "touch-to close" fastener for example of the type known under the Trade Mark "VELCRO". Thus the fastening hooks for the connectors can be dispensed with, simplifying the design of the container.



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CABLE CONTAINER HAVING IMPROVED FASTENING MEANS

The present invention provides a container for accommodating cables. More in particular the present invention provides a container for accommodating incoming cables, outgoing cables and connectors connecting the incoming and outgoing cables, fastening means being provided for fastening the connectors to the container. Such a container is
5 known in practice, e.g. for use as a so-called patching tray for fibre optic cables.

Cable containers of this type are used for connecting individual cable elements (wires or fibres) and storing any excess lengths ("slacks") in an organised fashion so as to allow new and/or alternative connections to be easily made. To this end, the cable container may
10 contain storage space for cable or wire loops in addition to the fastening means for fastening the connectors to the bottom of the container.

In the case of patching trays for optical fibre cables, for example, the container is constituted by a flat, shallow tray into which the cables can be fed. A row of hooks, integral
15 with the bottom of the tray, constitutes the fastening means for fastening the connectors to the tray. Although such a row of hooks is quite adequate for keeping the connectors in place, it suffers from several drawbacks.

A first drawback is the fact that the hooks are of predetermined size, thus fitting only
20 connectors of predetermined dimensions. Replacing one or more hooks would not be possible in many existing containers as the hooks are integral with the container. Thus, existing containers have the problem of not being able to fit connectors of a different size.

A second drawback is the fact that the hooks take up space whereby the number of
25 connectors that can be fitted in a container of certain dimensions is limited.

It is therefore an object of the present invention to provide a container for accommodating cables which allows connectors of different sizes to be fitted.

30 It is another object of the present invention to provide a container for accommodating cables in which the fastening means take up less space.

It is a further object of the present invention to provide a container for accommodating cables which is both flexible and economical.

5 These and other objects are met by a container as defined in the preamble which according to the present invention is characterised in that the fastening means are constituted by at least one first fastening pad fixed to the container and second fastening pads fixed to the individual connectors, the first and second fastening pads being designed so as to provide a bond.

10

By having fastening pads which provide a mutual bond, connectors may be fitted in the container and be held in place without the need for hooks or similar means. As the second fastening pads may be fixed to e.g. the bottom surface of each container, the fastening means of the present invention take up no space between the connectors. In addition, a connector
15 may be fitted onto any desired position on the first pad, irrespective of the connector's dimensions.

Preferably, the bond provided by the first and second fastening pads is a releasable bond. A releasable bond enables the fitted connectors to be relocated within or removed
20 from the container.

Thus a great measure of flexibility is provided. Still, the fastening means of the present invention can be inexpensive as the conventional fastening hooks can be omitted.

25 Preferably, the first fastening pad and at least one second fastening pad together comprise a "touch-to-close" fastener, preferably of the type known under the Trade Mark "VELCRO". "VELCRO" type pads provide an ideal releasable bond. The actual "VELCRO" pad having hooklets preferably constitutes the second fastening pads fixed to the connectors, the counterpart cloth or other material constituting the first fastening pad fixed to
30 the container. However, a reversed design is also possible, or a design in which the first and second fastening pads have an identical structure, for example a "mushroom" structure.

Alternatively, the first fastening pad comprises an adhesive strip. The adhesive strip may have a layer of glue or a similar adhesive for providing a firm but non-permanent bond. The releasable bond ensures that the fitted connectors may be relocated within or removed from the container. In such an embodiment, the second fastening pads are integral with a
5 face of each connector, preferably its bottom surface. That is, no separate second pads are provided. This allows a simpler and more economical design of the fastening means.

It is noted that British Patent Application GB 2 150 313 discloses a fibre optic splice organiser in which fibres and splices may be secured using a hook and loop fabric strips of the
10 "VELCRO" type. However, these fabric strips are not used to fasten connectors. It will be understood that the fastening of connectors, which are large relative to the optical fibre cables, is quite different from the fastening of delicate fibre splices.

A container of the invention may advantageously be used in a cable organising
15 cabinet.

The invention will further be explained below by way of exemplary, non-limiting embodiments shown in the accompanying drawings, in which:

Figure 1 shows, in perspective, a patching tray according to the Prior Art.

20 Figure 2 shows, in perspective, a patching tray according to the present invention.

Figure 3 schematically shows, in side view, part of a patching tray according to the present invention.

Figure 4 shows, in perspective, a first embodiment of connector fastening means according to the present invention.

25 Figure 5 shows, in perspective, a second embodiment of connector fastening means according to the present invention.

The exemplary prior art container 1 of figure 1 is designed for use as a so-called patching tray for optical fibre cables (an optical fibre cable is understood to contain a single
30 optical fibre or a plurality of optical fibres). The tray comprises openings 7 for feeding incoming cables into the tray, an area 9 for accommodating cable loops (excess cable), fastenings 2 for fastening connectors which connect incoming cables to outgoing cables, an area 10 for accommodating further cable loops, and openings 8 for feeding outgoing cables

from the tray. For the sake of clarity of the figure, the cables, cable loops and connectors are not shown.

5 In the tray 1 shown in figure 1 the fastening means 2 are constituted by hooks which extend from the bottom of the tray and are integral with it. The dimensions and spacings of the hooks are chosen to match the specific type and size of connector. As will be clear from figure 1, it is not possible to fit connectors of a different size in this prior art tray. Also, since all hooks and spacings have uniform dimensions, only connectors of one specific type and size can be fitted.

10 In the tray 1 shown in figure 2, the fastening means 2 are according to the present invention constituted by fastening pads, which are shown in more detail in figure 3. Such a fastening pad extends in the exemplary embodiment of figure 2 over the full width of the patching tray. This allows connectors of various sizes and types to be fitted. As no room is taken up by hooks or similar means, the full width of the tray is indeed available for fitting connectors. Also, the user of the tray is completely free to determine where a connector is to be fitted, as the fastening means of the present invention do not impose predetermined locations or "slots" upon the user. In summary, a very flexible design is achieved by using a fastening pad instead of hooks or the like.

20 In figure 3 part of the tray 1 of figure 2 is shown in more detail. Also, an incoming or first cable 11, an outgoing or second cable 12 and a connector 13 connecting the first and second cables are shown. The fastening means 2 are constituted by a first fastening pad 3 fixed to the tray 1 and a second fastening pad 4 fixed to the connector 13. When the first and second fastening pads are brought together, they form a substantially instantaneous bond, thus fastening the connector 13 to the tray 1. Preferably, the bond thus formed is releasable, allowing fitted connectors to be moved or removed. However, this is not essential to the present invention and many of the advantages of the present invention may be obtained by fastening means providing a permanent bond.

30 The fastenings pads 3, 4 may be fixed to the container 1 and the connectors 13 respectively by means of a suitable glue or the like. Preferably, a pressure sensitive adhesive material is used. Instead of a single first fastening pad 3, two or more may be fitted, for

example as two parallel fastening strips. Similarly, each connector may be provided with one, two or more fastening pads 4.

The fastening pad 3 can be constituted by an adhesive (for example glue), preferably the adhesive of an adhesive tape. Advantageously, the adhesive tape is double sided, one side being used for fixing the tape to the tray, the other side for fastening the connectors 13. If an adhesive or an adhesive tape is used, the second fastening pads 4 may be omitted, the bottom surfaces of the connectors 13 constituting the "pads".

In a very advantageous embodiment of the present invention, the fastening pads 3, 4 are constituted by a "touch-to-close" fastener, preferably of type known under the Trade Mark "VELCRO". Such a fastener is shown enlarged and in more detail in figure 4. The first fastening pad 3 may be a pad or cloth having looplets, while the second fastening pad 4 may be a "VELCRO" pad proper having hooklets. This arrangement provides an instantaneous and solid yet releasable bond. The connectors can be fitted by merely pushing them into place. On the other hand, fitted connectors may be removed by just pulling them from the tray. This provides a very simple and efficient fitting technique. Still, the bond obtained with "VELCRO" type fastening pads has proved to be resistant to vibrations and other movements.

An alternative embodiment of the fastening means 2 is shown in figure 5. In this embodiment, both the first fastening pad 3 and the second fastening pad 4 are of the same, "mushroom" shaped design. In this design, the hooks and loops are replaced by half-spheres, mounted on stems so as to produce a "mushroom" shape. The half-spheres of the two pads are capable of interlocking so as to provide a releasable bond.

It will be understood by those skilled in the art that the present invention is not limited to the embodiments illustrated above and that many modifications and additions are possible without departing from the scope of the present invention as defined in the appending claims.

CLAIMS

1. Container (1) for accommodating incoming cables (11), outgoing cables (12) and connectors (13) connecting the incoming and outgoing cables, fastening means (2) being provided for fastening the connectors (13) to the container,
characterised in that the fastening means (2) are constituted by at least one first fastening pad (3) fixed to the container (1) and second fastening pads (4) fixed to the individual connectors (13), the first and second fastening pads being designed so as to provide a bond.
2. Container according to claim 1, wherein the bond is releasable.
3. Container according to claim 2, wherein the first fastening pad (3) and at least one second fastening pad (4) together comprise a "touch-to-close" fastener, preferably of the type known under the Trade Mark "VELCRO".
4. Container according to claim 1 or 2 wherein the first fastening pad (3) comprises an adhesive strip.
5. Container according to claim 4, wherein the second fastening pads (4) are integral with a face of each connector (13), preferably its bottom surface.
6. Container according to any of the preceding claims, wherein the first fastening pad (3) extends substantially transversely to the longitudinal axis of the container (1).
7. Container according to any of the preceding claims, which container is a patching tray for optical fibres.
8. Cable organising cabinet, provided with a container (1) according to any of the preceding claims.

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Fig.1.

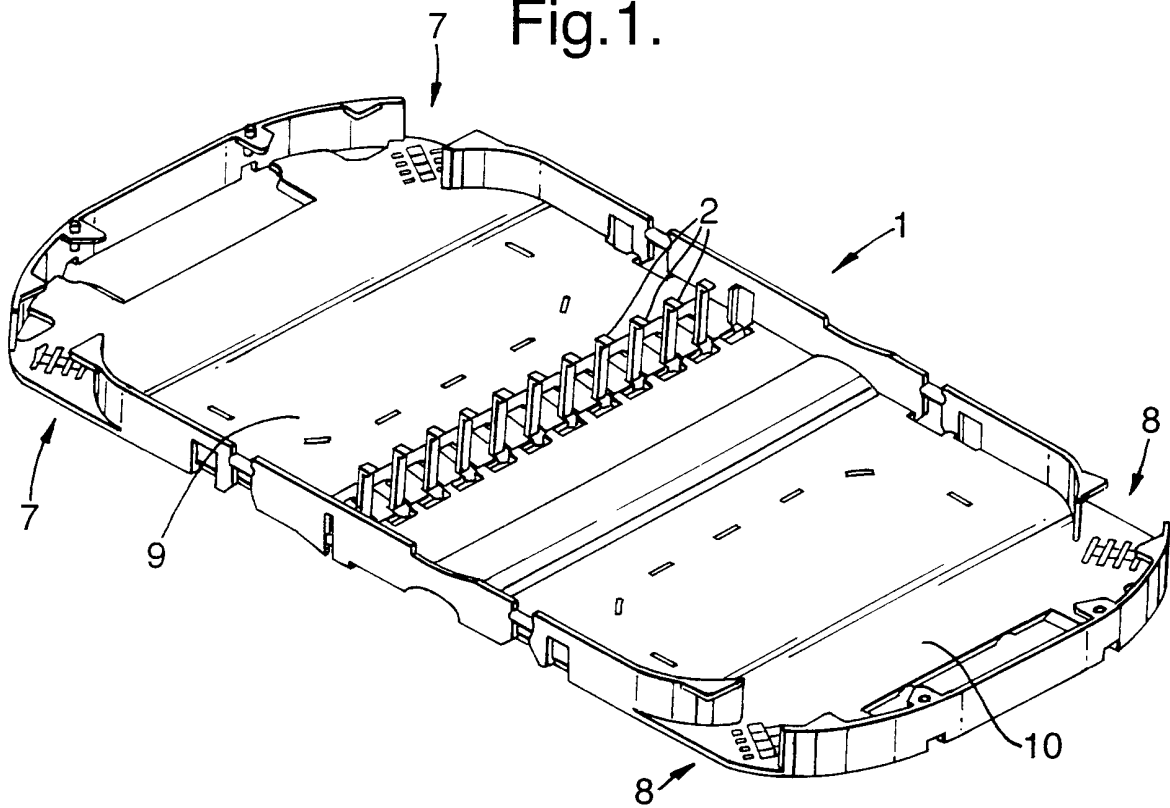


Fig.2.

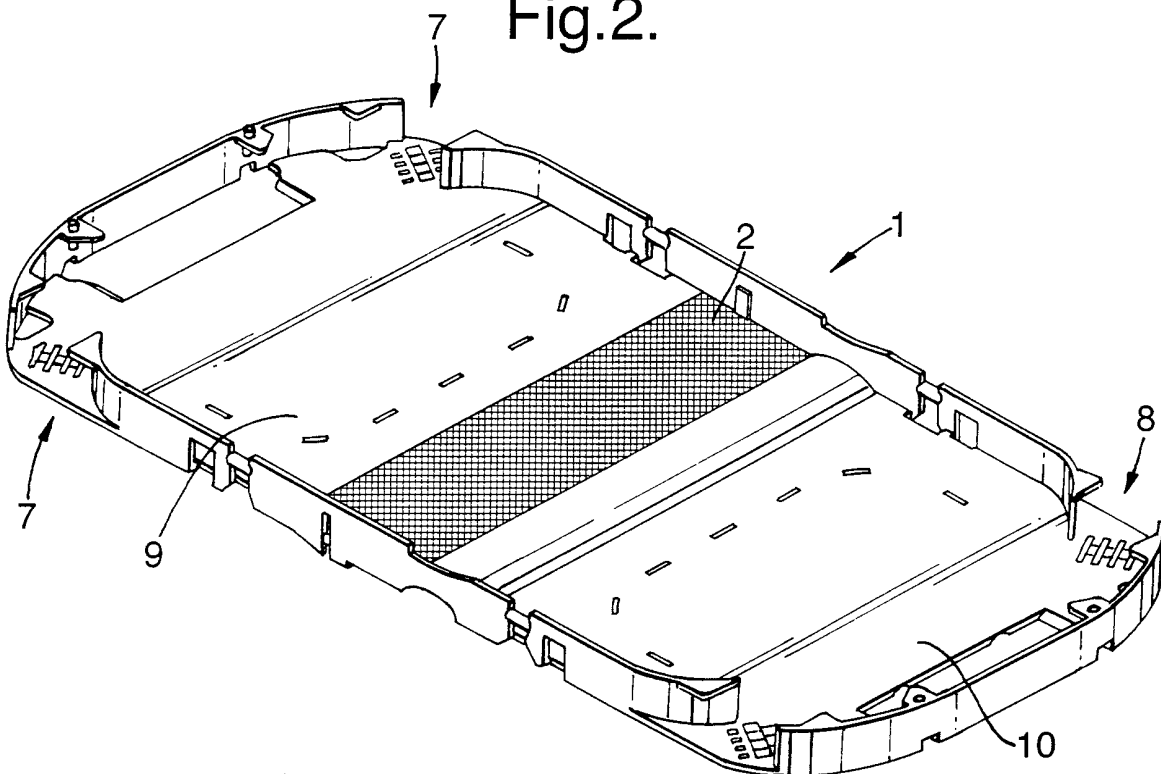


Fig.3.

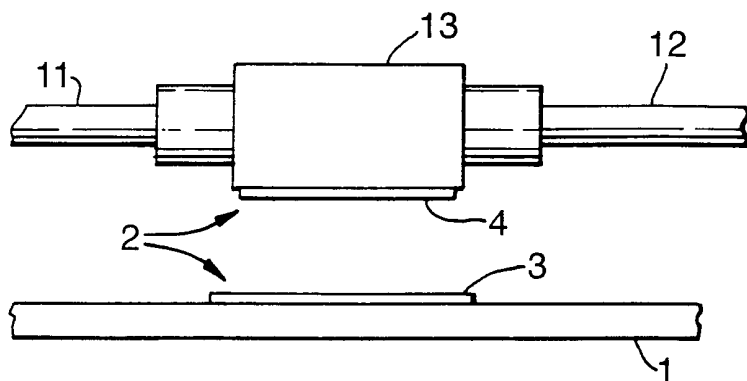


Fig.4.

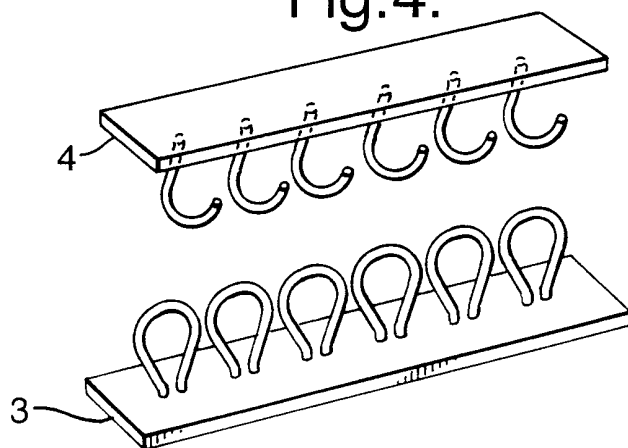


Fig.5.

