



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
04.11.2009 Bulletin 2009/45

(51) Int Cl.:
H01R 31/06 (2006.01) H01R 24/06 (2006.01)

(21) Application number: **09157527.4**

(22) Date of filing: **07.04.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR

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(30) Priority: **30.04.2008 IT MI20080802**

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(54) **Adaptor device for printed circuit connectors**

(57) The present invention refers to an adaptor device for printed circuit connectors comprising, at a first end, an interface (11) configured as an RJ-45 connector from which a first portion (12a) of at least two contacts (12) face out on a first side, at a second end foreseeing

a housing seat (13) inside which a third portion (12c) of said at least two contacts (12) projects. Preferably, the housing seat (13) has a box-shaped configuration open on a side face and on the upper face, the third portions (12c) of contacts (12) are housed inside the housing seat (13) and project towards the open upper face.

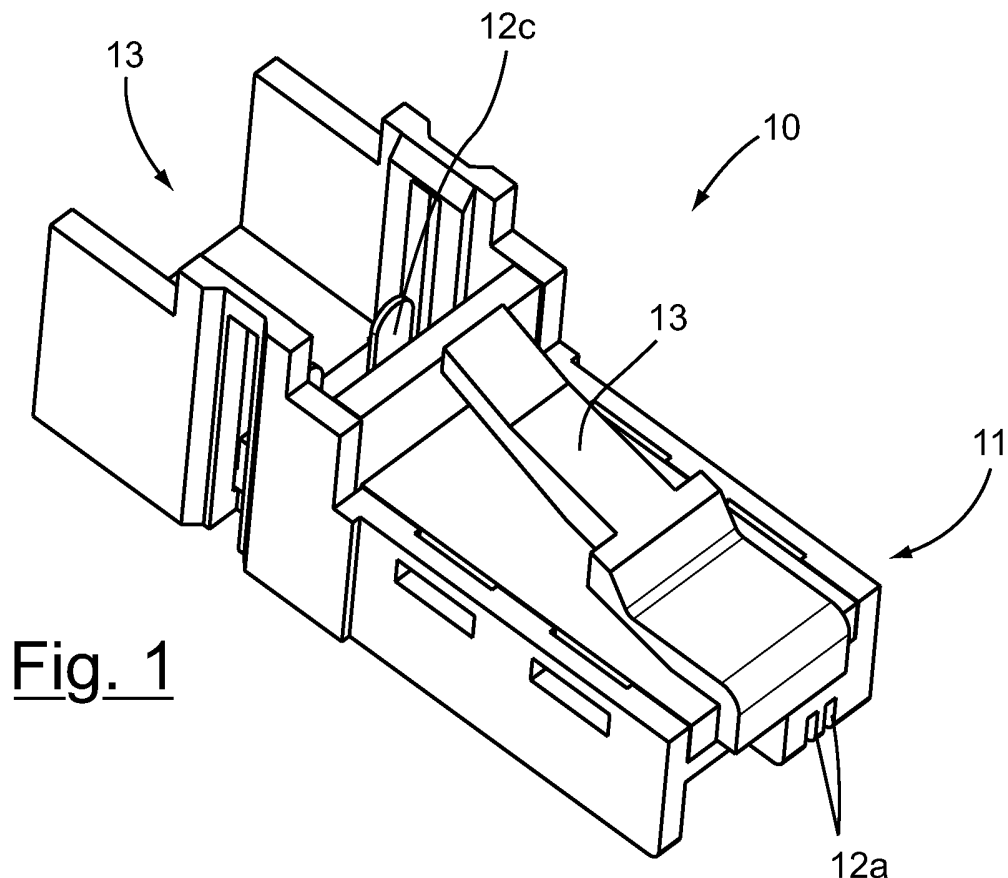


Fig. 1

Description

[0001] The present invention refers to an adaptor device for printed circuit connectors.

[0002] Nowadays, in various types of electronic systems, like for example automation, control and communication systems, it is known to use a BUS with two conductors to allow the exchange of signals between the devices that are part of such systems.

[0003] Systems of this type, performing different functions like for example the control and the automation of loads such as lights or motors, the monitoring and controlling of the atmosphere such as anti-intrusion, telecommunication or audio and video phoning, sound diffusion, heat regulation and so on, are wide spread being used both in domestic and tertiary sector.

[0004] To this day, for the interconnection of the individual devices used in such systems, different types of connectors, for printed circuits of the male or female type, are used, which couple with a matching connector (female or male) welded onto the printed circuit.

[0005] In particular, for BUSES with two conductors, various standards of different connectors have been widely used, unavoidably bringing a limitation to the compatibility of use of the devices.

[0006] To this day it is indeed not simple to make the connection between a first device, equipped with one particular connector, and a system using a different type of connector.

[0007] Up against such a situation, an installer is obliged to modify the pre-existing conductors, creating a new one *ad hoc* which has, at a first end, an interface compatible with the first connector and at the second end, an interface compatible with the second connector.

[0008] Such an operation, as well as being long and laborious, isn't always possible. For example, in the case of a *Registered Jack* connector type 45 or RJ-45, i.e. made according to a United States standard, defined by the

[0009] Federal Communications Commission (FCC), and widely used in the United States, the connection of the single conductors to the connector cannot be done manually, as in order to do so, the connectors must be connected at the terminations of such a connector through a suitable tool called crimper able to mechanically squash the conductors so that they stay blocked onto the connector.

[0010] For connecting a control device and/or terminal having an interface made by a type RJ-45 connector to a system using a different type of connector, the installer is obliged to find an improvised solution, finding a conductor with RJ-45 interfaces and suitably replacing at least one of them. Such an operation has many difficulties and takes a long time as well as introducing the possibility of error in the connecting of two of the eight cables in a similar conductor.

[0011] Otherwise it would be possible to modify the pre-existing devices, in order to have a direct interface

with the system that is compatible with it. However, such modifications are often correlated to high costs as it is not generally sufficient to modify only the making of the printed circuit by solely replacing the connector attached to it, but it is also necessary to redefine the casing of the devices and, consequently, the moulds for making them.

[0012] In order to avoid these kinds of drawbacks in defining a system it is therefore preferable to avoid using devices with interfaces that are incompatible with it, thus greatly limiting the choice of the devices to use.

[0013] The purpose of the present invention is that of avoiding the aforementioned drawbacks and in particular that of devising an adaptor device for printed circuit connectors that makes it possible to use apparatuses having an RJ-45 type connector as interface, even in systems using different types of interface.

[0014] Another purpose of the present invention is that of providing an adaptor device for printed circuit connectors that facilitates the installation of an electronic system making it unnecessary to make *ad hoc* conductors with interfaces.

[0015] Yet another purpose of the present invention is that of making an adaptor device for printed circuit connectors, in particular of the removable type, that maintains the characteristic of being removable.

[0016] These and other purposes according to the present invention are achieved by making an adaptor device for printed circuit connectors as outlined in claim 1.

[0017] Further characteristics of the device are object of the dependent claims.

[0018] The characteristics and the advantages of an adaptor device for printed circuit connectors according to the present invention shall become clearer from the following description, given as an example and not for limiting purposes, referring to the attached schematic drawings in which:

- Figure 1 is a perspective view of a first embodiment of an adaptor device for printed circuit connectors of the male-male type;
- Figure 2 is a perspective view from below of the adaptor of figure 1;
- Figure 3 is a perspective view of the contacts used in the adaptor device for printed circuit connectors according to the present invention;
- Figure 4 is a perspective view of the adaptor of figure 1 connected to a clamp type removable printed circuit connector;
- Figure 5 is a perspective view of a second embodiment of a male-male type adaptor device for printed circuit connectors;
- Figure 6 is a perspective view of a third embodiment of a male-female type adaptor device for printed circuit connectors;
- Figure 7 is a perspective view of the adaptor of figure 6 connected to a clamp type removable printed circuit connector.

[0019] With reference to the figures, an adaptor device for printed circuit connectors is shown, wholly indicated with 10.

[0020] The adaptor device 10 comprises, at a first end, an interface 11 configured as an RJ-45 type connector from which at least two contacts 12 face out on a first side.

[0021] The at least two contacts 12 each comprise a first portion 12a projecting from the RJ-45 type interface 11, a second portion 12b made as a track and a third portion 12c configured as a pin. Such a third portion 12c of contact 12 can be made, in an equivalent way, as a cylindrical or flat pin.

[0022] In a preferred embodiment, the first portions 12a of the at least two contacts 12 respectively face out from the seats 18 for the contacts foreseen in the interface 11 arranged at the seventh and eighth standard position of the contacts of an RJ-45 type connector. In this way it is ensured that, even in case in which the adaptor is used inappropriately, there will be no short circuits that could damage the electronic components.

[0023] On the other hand, at a second end of the adaptor device, a housing seat 13 is foreseen, suitable for receiving a connector 14 for removable type printed circuit.

[0024] The seat 13 is made in such a way as to house different types of printed circuit connectors, like for example, a removable clamp connector 14 illustrated in figure 4, or else a different type of removable connector like for example an insulation displacement connector.

[0025] For this purpose the housing seat 13 has a box-shaped configuration open on one side and on top and houses inside of it the third portions 12c of contacts 12 that project towards the open upper face.

[0026] In particular, the third portion 12c configured as a pin is preferably made with sizes and diameter equal to that of the male pins mounted on printed circuits for coupling with standard type connectors 14.

[0027] Moreover, at such a third portion 12c the two contacts are spaced apart by a measurement corresponding to the standard measurement of the pitch of such male pins.

[0028] The standard type printed circuit connectors 14 comprise first seats 15 for coupling with at least two pin-shaped contacts, which then couple with the third portions 12c of the contacts 12 of the adaptor device 10 projecting inside the housing seat 13, and a second seat in which a plurality of conductors (not illustrated) are suitably inserted and held through special locking means.

[0029] In the first embodiment illustrated in figures 1-4, the interface 11 is of the male RJ-45 type and therefore comprises, on the second side of the interface 11, opposite to where the contacts 12 face out, a flexible tab 16 diverging from the interface 11, suitable for cooperating with the seat of a female RJ-45 connector to keep a fixed but releasable coupling between the two connectors.

[0030] Preferably, the housing seat 13 for printed circuit connectors faces out from the same side in which the flexible tab 16 is foreseen, thus ensuring a substan-

tially equivalent bulk to that of a conventional male RJ-45 type connector.

[0031] It is however possible to foresee a second embodiment, as illustrated in figure 5, in which the housing seat 13 faces out towards the same first side from which the contacts 12 face out from the RJ-45 type interface 11.

[0032] The adaptor devices 10 according to the first two embodiments of the present invention can be connected to a device provided with a female RJ-45 type interface so as to transform such an interface into a generic interface for projecting male or pin connectors of a printed circuit board. It is possible in this way, to use any conductor for the connection of a device with RJ-45 interface to a system using a different interface.

[0033] Figures 6 and 7 show a third embodiment in which the interface 11 is of the female RJ-45 type, therefore comprising a seat 17 suitable for receiving a male RJ-45 connector, inside of which the first portions 12a of the at least two contacts 12 face outwards.

[0034] Also in this case the first portions 12a of the at least two contacts 12 preferably face out from the seats 18 for the contacts foreseen in the interface 11 respectively arranged at the seventh and eighth standard position of the contacts of an RJ-45 type connector.

[0035] The adaptor device 10, according to the third embodiment of the present invention, can be used to modify the interface of a conductor having RJ-45 interfaces, so that it can be connected to a different type of interface.

[0036] From the description made, the characteristics of the device, object of the present invention, are clear, as are the relative advantages.

[0037] Finally, it is clear, that the device thus conceived is able to undergo numerous modifications and variants, all of which are covered by the invention; moreover, all of the details can be replaced by technically equivalent elements. In practise, the materials used, as well as their sizes, can be whatever according to the technical requirements.

Claims

1. Adaptor device (10) for printed circuit connectors comprising, at a first end, an interface (11) configured as an RJ-45 connector from which a first portion (12a) of at least two contacts (12) face out on a first side, at a second end foreseeing a housing seat (13) inside which a third portion (12c) of said at least two contacts (12) projects.
2. Adaptor device (10) for printed circuit connectors according to claim 1 **characterised in that** said housing seat (13) has a box-shaped configuration open on a side face and on the upper face, said third portions (12c) of contacts (12) being housed inside said housing seat (13) and projecting towards said open upper face.

3. Adaptor device (10) for printed circuit connectors according to claims 1 or 2 **characterized in that** said third portion of said at least two contacts (12) is configured as a pin. 5
4. Adaptor device (10) for printed circuit connectors according to any one of the previous claims **characterized in that** said housing seat (13) is suitable for receiving a connector (14) for a removable type printed circuit. 10
5. Adaptor device (10) for printed circuit connectors according to any one of the previous claims **characterized in that** said first portion (12 a) of contact (12) projecting from said RJ-45 type interface (11) is connected to said third portion (12c) of contact (12) configured as a pin through a second portion (12b) of contact (12) made as a track. 15
6. Adaptor device (10) for printed circuit connectors according to any one of the previous claims **characterized in that** said interface (11) is configured as a connector of the male RJ-45 type. 20
7. Adaptor device (10) for printed circuit connectors according to claim 6 **characterized in that** said open upper face of said housing seat (13) is arranged on the side opposite the one where the said first portions (12a) of said contacts (12) face outwards. 25
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8. Adaptor device (10) for printed circuit connectors according to claims 6 or 7 **characterized in that** said interface (11) comprises, on the side opposite the one where said first portions (12a) of said at least two contacts (12) face outwards, a flexible tab (16) inclined with respect to said interface (11). 35
9. Adaptor device (10) for printed circuit connectors according to any of claims 1 to 5 **characterized in that** said interface (11) is configured as a connector of the female RJ-45 type. 40
10. Adaptor device (10) for printed circuit connectors according to any one of the previous claims **characterized in that** said first portions (12a) of said at least two contacts (12) are respectively arranged at the seventh and eighth position of the contacts of an RJ-45 type connector. 45

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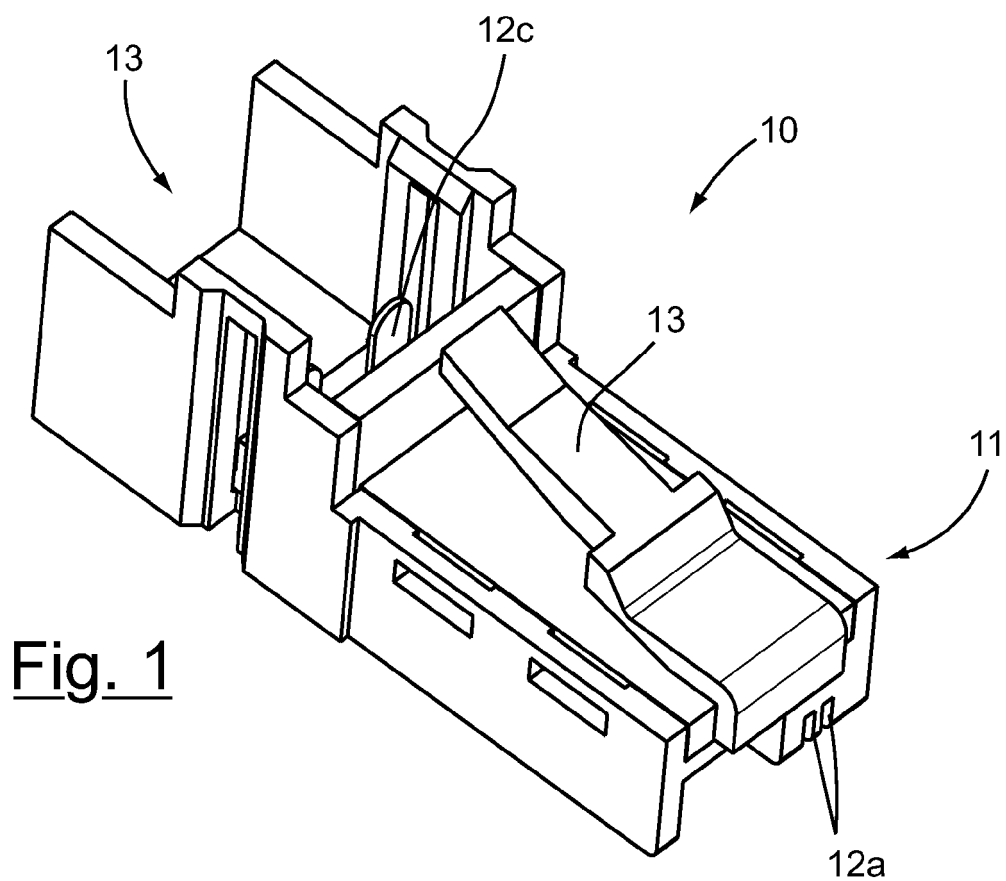


Fig. 1

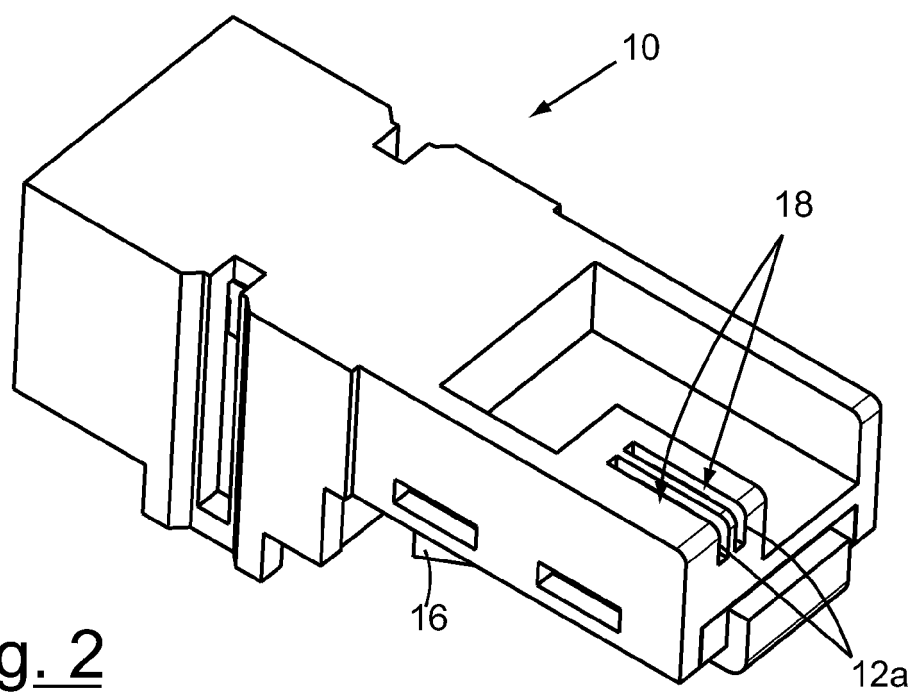
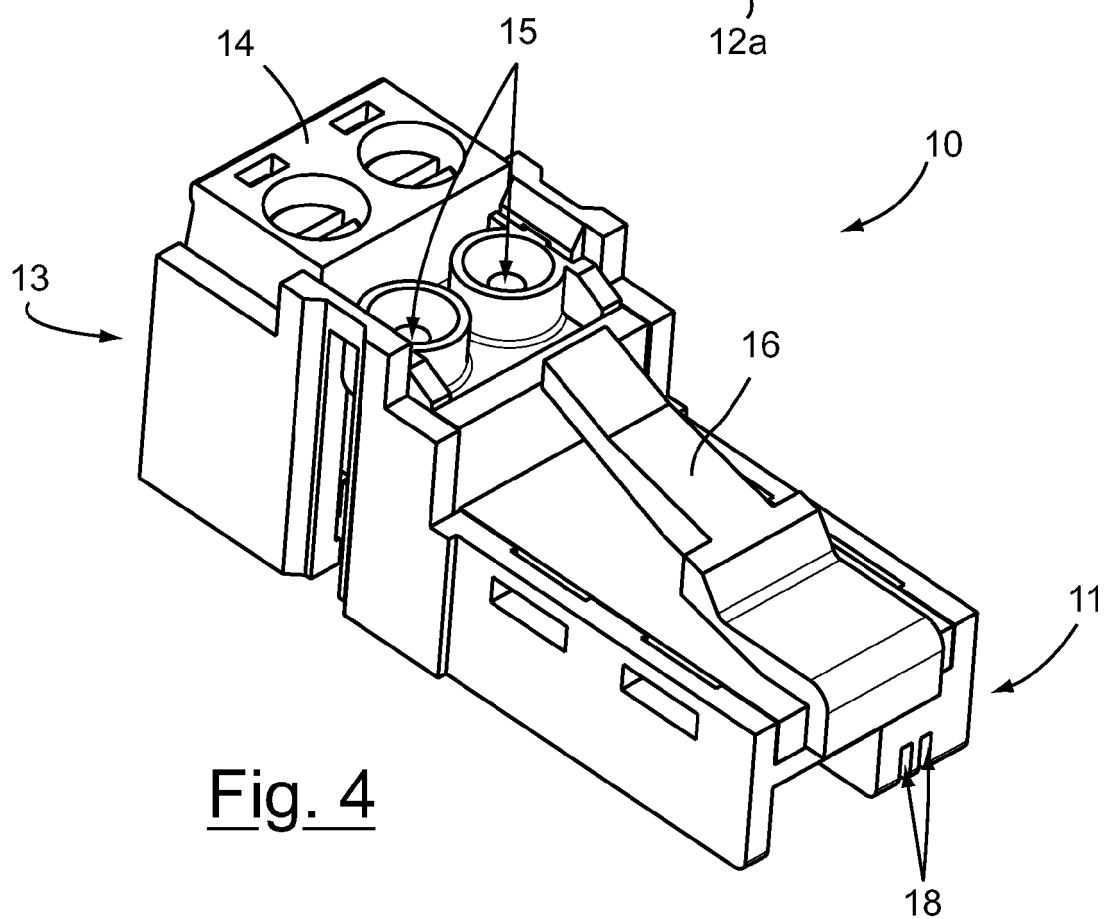
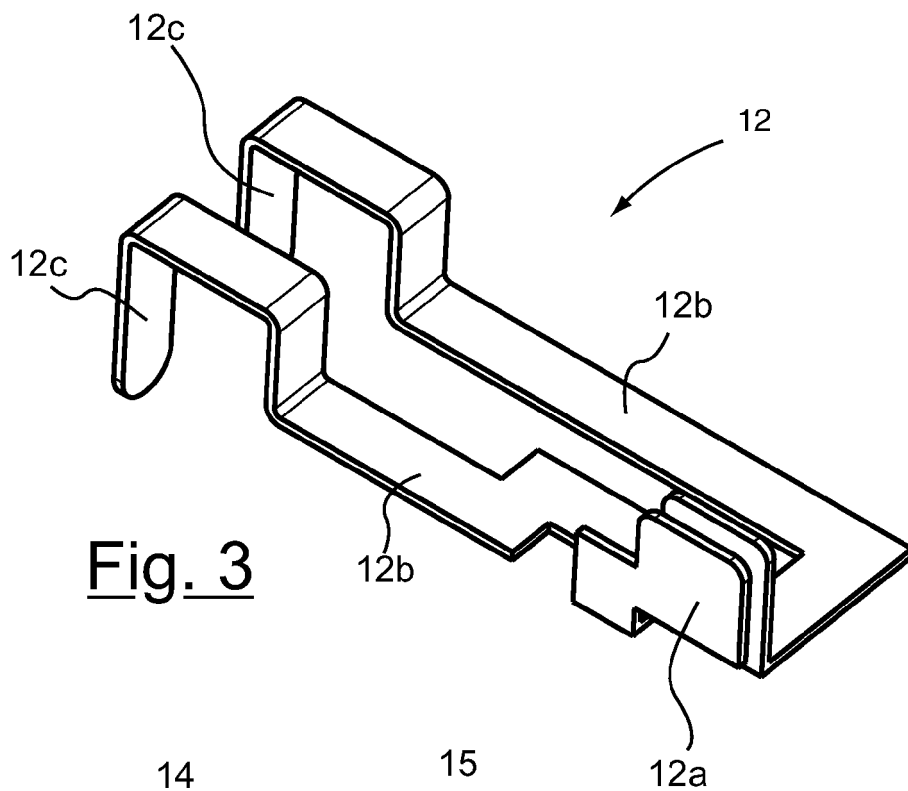
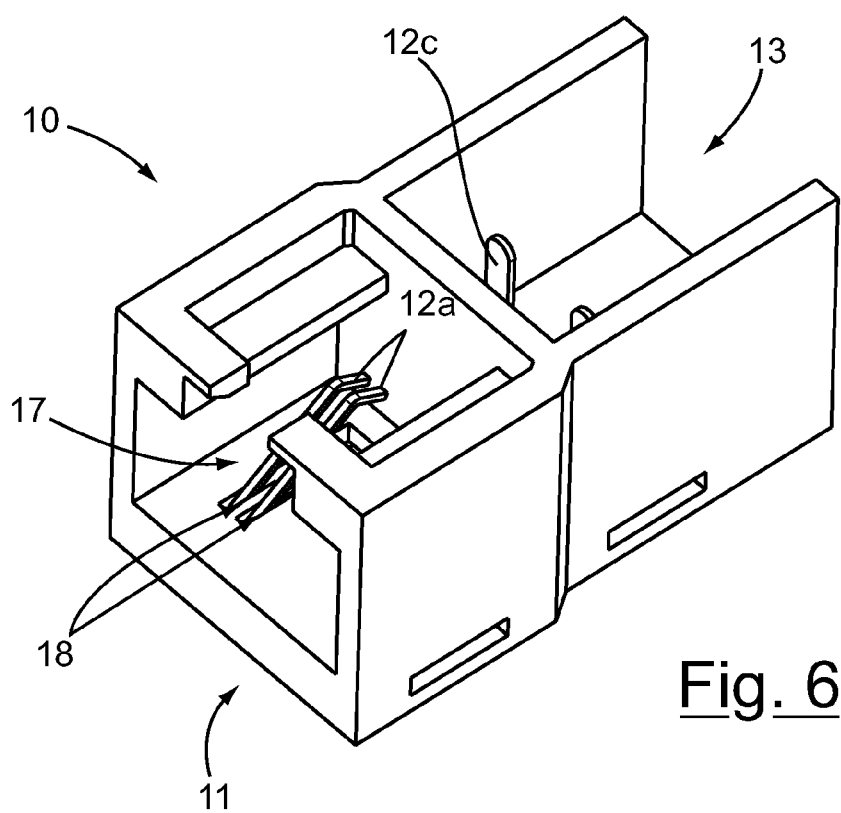
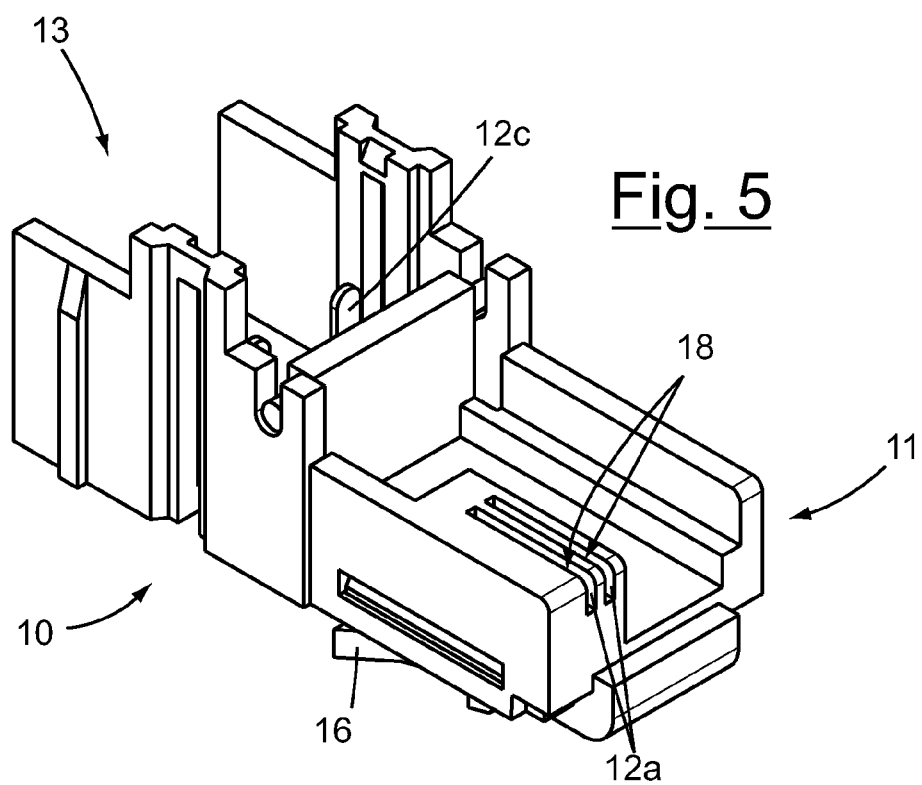


Fig. 2





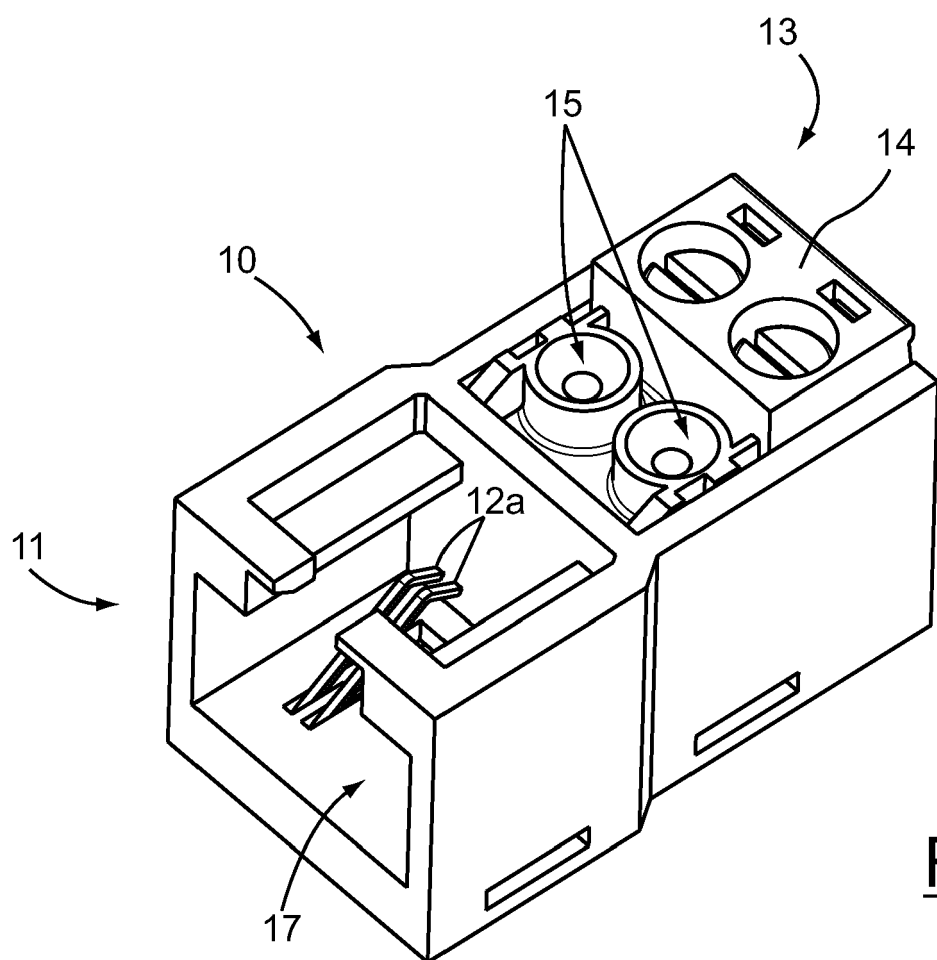


Fig. 7