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(11) **EP 1 260 999 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
27.11.2002 Bulletin 2002/48

(51) Int Cl.7: **H01H 11/00**

(21) Application number: **02011148.0**

(22) Date of filing: **21.05.2002**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**
Designated Extension States:
AL LT LV MK RO SI

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(30) Priority: **22.05.2001 IT MI20011067**

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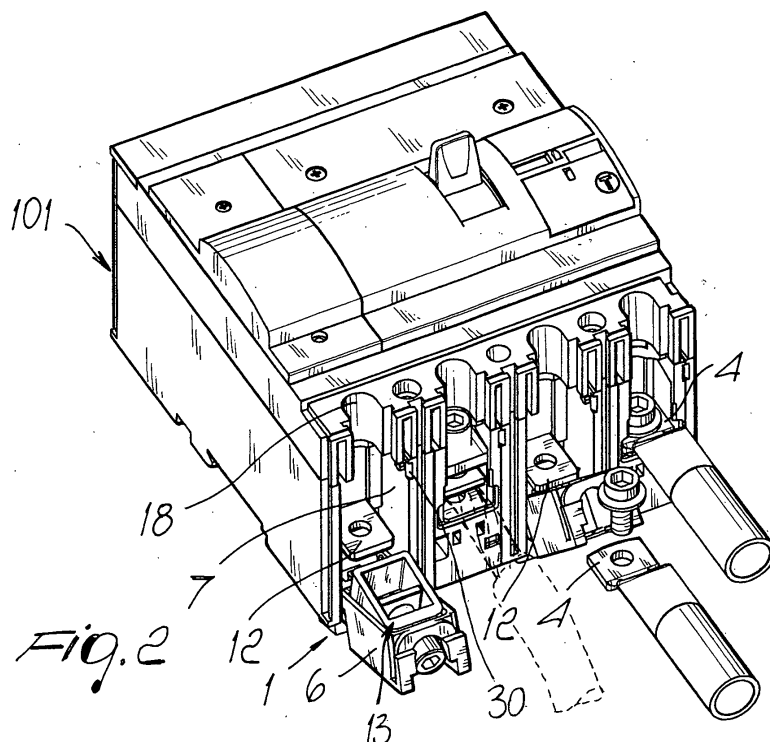
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(54) **Device for connecting conductors to electrical units such as circuit breakers and the like**

(57) A device for connecting conductors to electrical units such as circuit breakers and the like, comprising an oscillating member pivoted in a seat at an electrical contact to be connected to an external conductor, the oscillating member accommodating members for con-

necting the external conductor to the electrical contact and forming at least one active or closed position, inside the seat, and at least one open position, in which it is possible to preset the device for the particular type of connection to be performed.



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Description

[0001] The present invention relates to a device for connecting conductors to electrical units, such as circuit breakers and the like.

[0002] Electrical units, such as so-called enclosed circuit breakers, are provided with connection devices that allow to connect conductors to the contacts of the unit.

[0003] The conductors are typically constituted by cable terminals, bars, rear couplings for bars, and sometimes by the ends of electrical cables stripped of their insulation.

[0004] Cable terminals are substantially constituted by a small perforated plate that can be coupled to the contact, which is likewise provided with a hole, by means of a screw that engages a nut. Bars also are provided with holes at their ends in order to be connected in a similar fashion.

[0005] Rear couplings for bars or cable terminals are provided with a female-thread end that is connected to the contact and fixed thereto by means of a screw.

[0006] If it is necessary to connect the loose end of a cable, it is necessary to use a terminal, typically constituted by a parallelepipedal body suitable to support a sliding plate associated with an abutment screw, so that the end of the cable can be pressed, by acting on the screw, between the contact of the unit and the sliding plate.

[0007] Connection devices are known which include a movable member that is inserted by interlocking in a recess and allows to modify the device according to the type of connection to be performed, with a bar, a cable terminal or, by means of the insertion of a terminal, the end of an electric cable.

[0008] However, conventional devices are not sufficiently easy and quick to modify according to the connection to be provided, and also the connection of the conductor is often difficult and awkward to perform.

[0009] The aim of the present invention is to provide a device that allows to connect various types of conductor to electrical units, such as circuit breakers and the like, more rapidly and easily than conventional devices.

[0010] An object of the invention is to provide a device that is constructively simple and cheap from the point of view of production, so as to not affect the overall cost of the unit.

[0011] Another object is to provide a device that is functional and capable of offering the greatest assurances in terms of safety.

[0012] This aim, these objects and others which will become better apparent hereinafter are achieved by a device for connecting conductors to electrical units such as circuit breakers and the like, as claimed in the appended claims.

[0013] Further characteristics and advantages of the invention will become better apparent from the description of preferred but not exclusive embodiments thereof, illustrated only by way of non-limitative example in the

accompanying drawings, wherein:

Figure 1 is a perspective view of an enclosed circuit breaker provided with sliders for the electrical connections, according to the invention;

Figure 2 is a top perspective view of an enclosed circuit breaker that includes sliders for the electrical connections, according to the invention;

Figure 3 is a top perspective view of a set of sliders, shown in various open positions;

Figure 4 is a view, similar to Figure 3, which also illustrates the electrical connectors;

Figure 5 is an enlarged-scale perspective view of a member of a slider;

Figure 6 is a front perspective view of a set of sliders, shown in various open positions;

Figure 7 is a top perspective view of an enclosed circuit breaker that includes sliders for the electrical connections, according to the invention, and illustrates rear couplings for bars;

Figure 8 is a rear perspective view of an enclosed circuit breaker that includes sliders for the electrical connections, according to the invention, and illustrates rear couplings.

[0014] With reference to the above cited figures, the connection device according to the invention, generally designated by the reference numeral 1, can be used for the electrical connection in electrical units such as, for example, an enclosed circuit breaker 101, which has a plurality of devices constituted by sliders 1, respectively on an upper side 2 and on a lower side 3, for connection to electrical connectors, which are typically constituted by cable terminals 4, bars, or rear couplings 5, but can also be constituted by ends of electrical cables appropriately stripped of their insulation.

[0015] Each slider device 1 includes an oscillating member 6 pivoted in a recess 7 that is associated with the body of the unit 101 and includes at least one first seat 8 and at least one second seat 9.

[0016] The oscillating member 6 stably engages the recess 7 by means of a tooth, not shown in the figures, which can be deactivated by inserting a tool, for example the tip of a screwdriver, in an appropriate tool receptacle 30.

[0017] The first seat 8 can accommodate a female-thread member, typically constituted by a nut 10, which engages a screw 11 in order to connect a cable terminal 4 or a bar to a contact 12 of the unit 101.

[0018] The second seat 9 accommodates a terminal 13, for example of a per se known type constituted by a parallelepipedal body 14 supporting a sliding plate 15 associated with an abutment screw 16.

[0019] When the terminal 13 is placed in the second seat 9, the abutment screw 16 of the terminal is located at an upper notch 17 provided in the oscillating member 6. The upper notch 17 is also designed to allow the insertion of the screw 11 for fixing the cable terminal 4.

The screw 11 can be inserted in the oscillating member 6 also by means of a notch 18 formed in an upper region with respect to the recess 7 of the slider. The notch 18 of the hollow 7 and the upper notch 17 of the oscillating member allow to insert a screw 11 from the front while it is associated with a hex tool, thus sparing the operator from having to insert the screw 11 from above and then having to find the screw with the hex key.

[0020] The oscillating member 6 also has a Faston connector 20, which is conveniently formed monolithically with respect to a rear blade 19 which, when the oscillating member is closed, provides the electrical contact with a vertical plate 21 of the contact 12.

[0021] The movable member 6 can be opened downward, by breaking a wall, in order to allow the passage of a bar coupling 5 which has a female-thread end 22 suitable to receive the screw 11, in order to provide the connection to the contact 12, in a per se known manner.

[0022] In practice it has been observed that the invention achieves the intended aim and objects, a connection device having been provided which is characterized by the presence of an oscillating slider which allows to connect various types of conductor to electrical units, such as circuit breakers and the like, more rapidly and easily than conventional devices.

[0023] A particular advantage from the functional standpoint is the fact that the oscillating slider remains always associated with the body of the unit, facilitating work for the user, who does not have to worry about supporting this component as well.

[0024] The device according to the invention is susceptible of numerous modifications and variations, within the scope of the appended claims. All the details may be replaced with technically equivalent elements.

[0025] The materials used, as well as the dimensions, may of course be any according to requirements and to the state of the art.

Claims

1. A device for connecting conductors to electrical units such as circuit breakers and the like, **characterized in that** it comprises an oscillating member pivoted in a seat at an electrical contact to be connected to an external conductor, said oscillating member being adapted to accommodate members for connecting the external conductor to the electrical contact and forming at least one active or closed position, inside said seat, and at least one open position, in which it is possible to preset the device for the particular type of connection to be performed.
2. The device according to claim 1, **characterized in that** said seat is constituted by a recess that is rigidly coupled to the body of the unit and comprises at least one first seat and at least one second seat; said first seat being adapted to accommodate a fe-

male-thread member which engages a fastening screw in order to connect a cable terminal of a conductor to the contact of the unit; said second seat being adapted to accommodate a terminal-type device.

3. The device according to claim 1 or 2, **characterized in that** said oscillating member comprises an upper notch that allows the insertion of said fastening screw for fastening the cable terminal or of an abutment screw that is part of said terminal-type device.
4. The device according to one or more of the preceding claims, **characterized in that** it comprises a notch formed in an upward region with respect to said recess, said notch of the recess and said upper notch of the oscillating member allowing to insert said fastening screw from the front and so that it is already associated with the tool used for tightening, sparing the operator from having to insert said screw from above and then having to find the screw with said tightening tool.
5. The device according to one or more of the preceding claims, **characterized in that** said oscillating member is further provided with a Faston connector, formed monolithically with a rear blade which, when the oscillating member is closed in said recess in the active position, provides electrical contact with a vertical plate of the contact of the unit.
6. The device according to one or more of the preceding claims, **characterized in that** said movable member is open in a lower region in order to allow the passage of a rear coupling which has a female-thread end which receives said fastening screw, in order to provide connection to the contact of the unit.

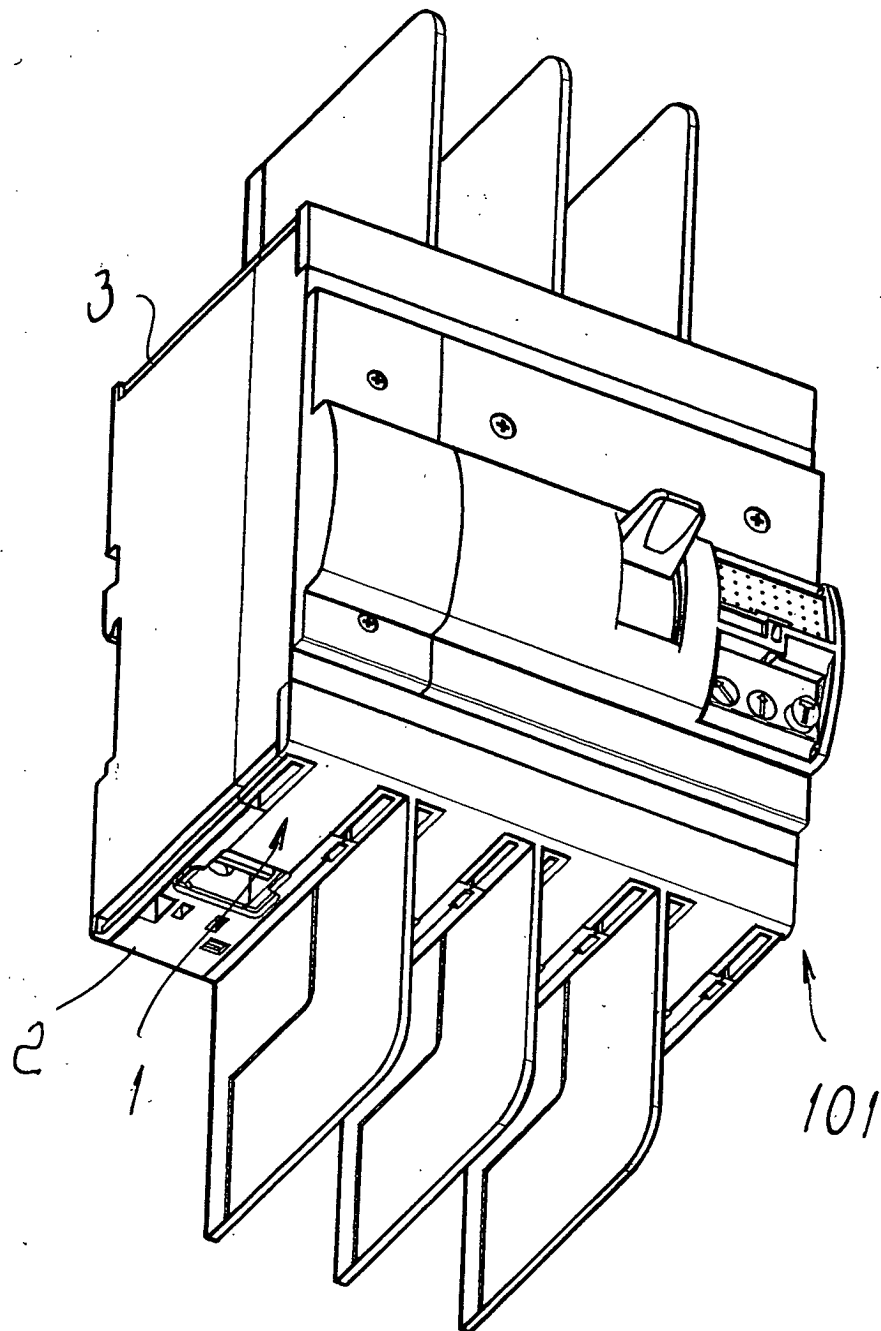
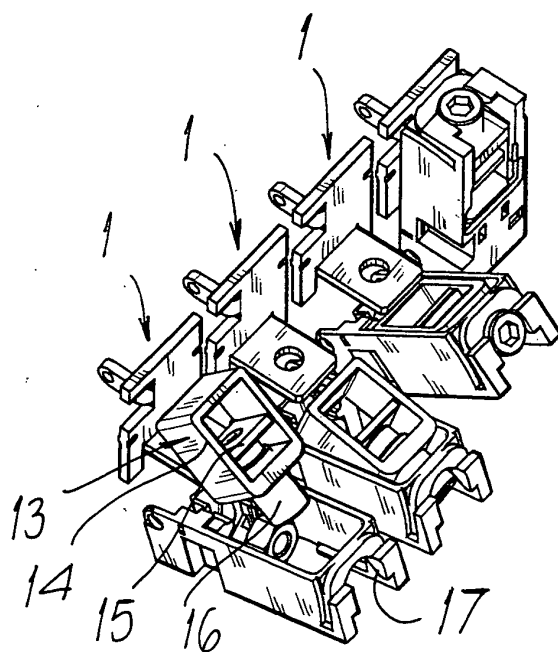
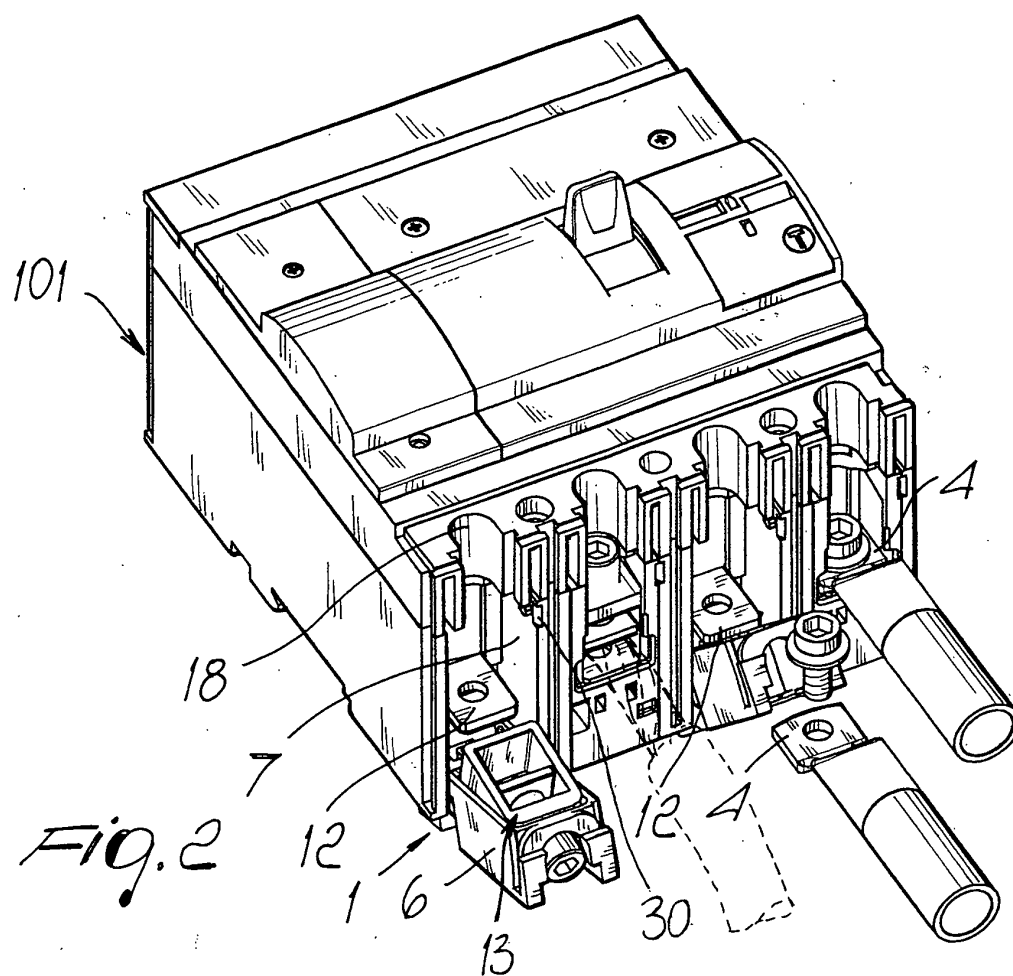


Fig. 1



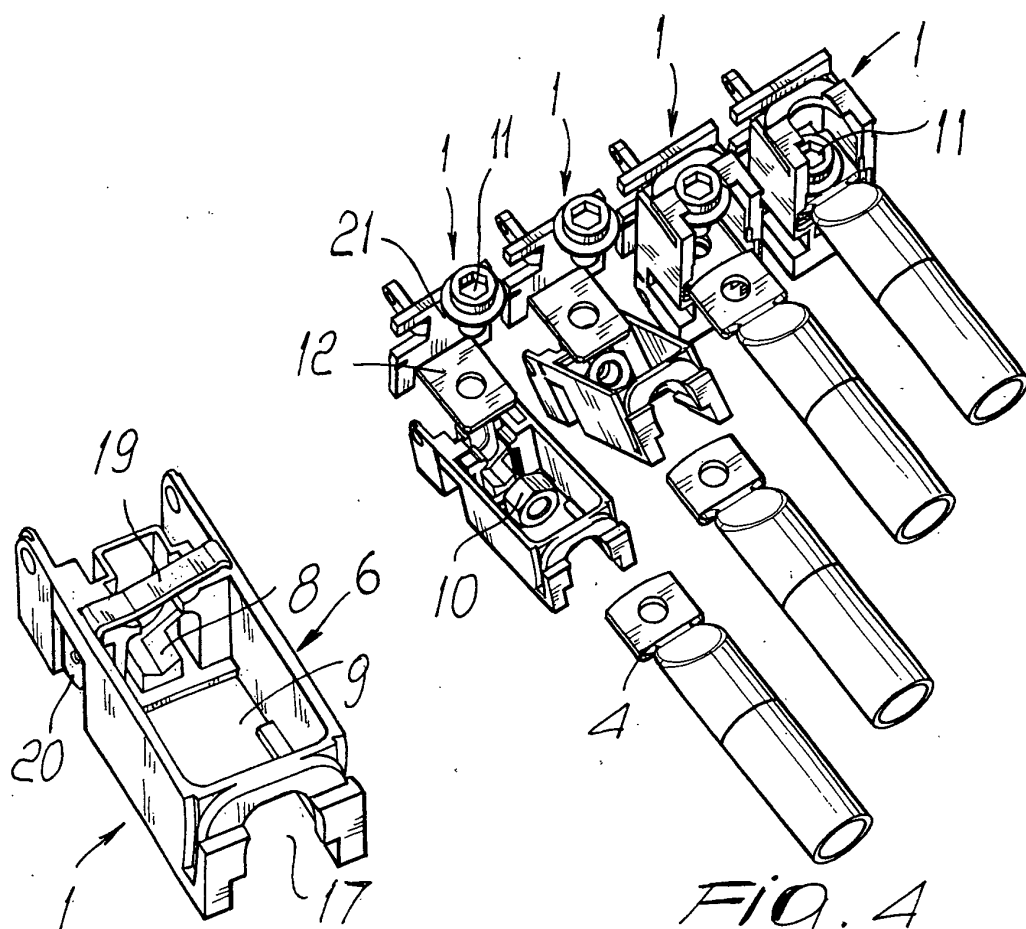


Fig. 5

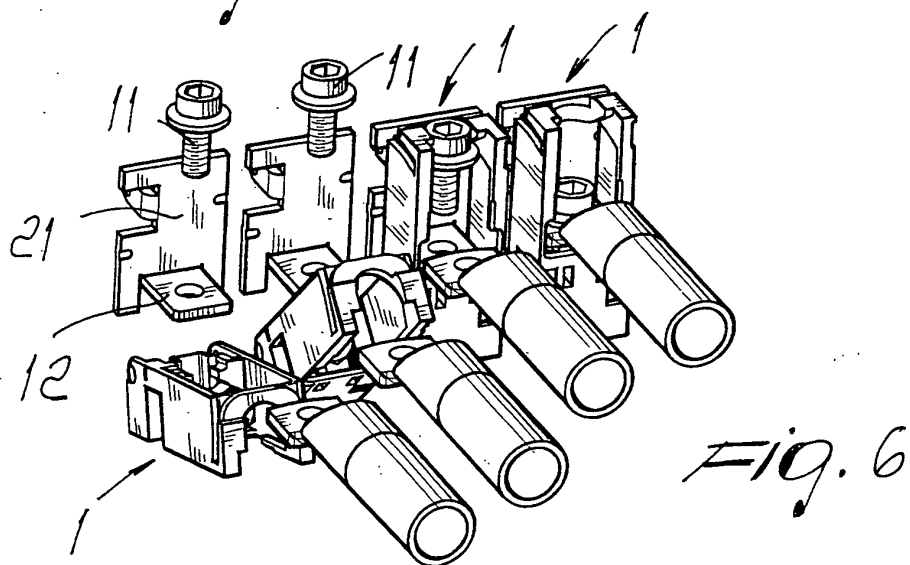


Fig. 6

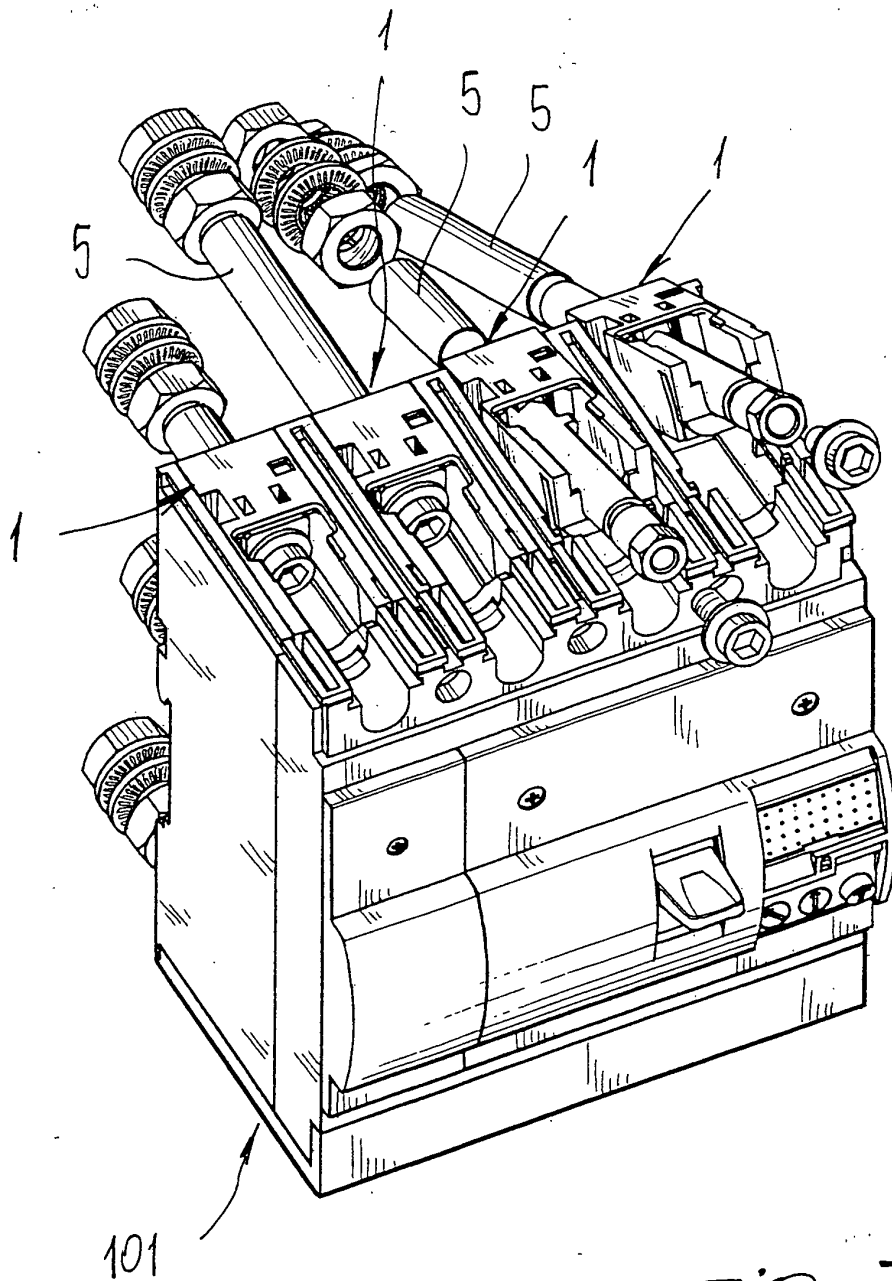
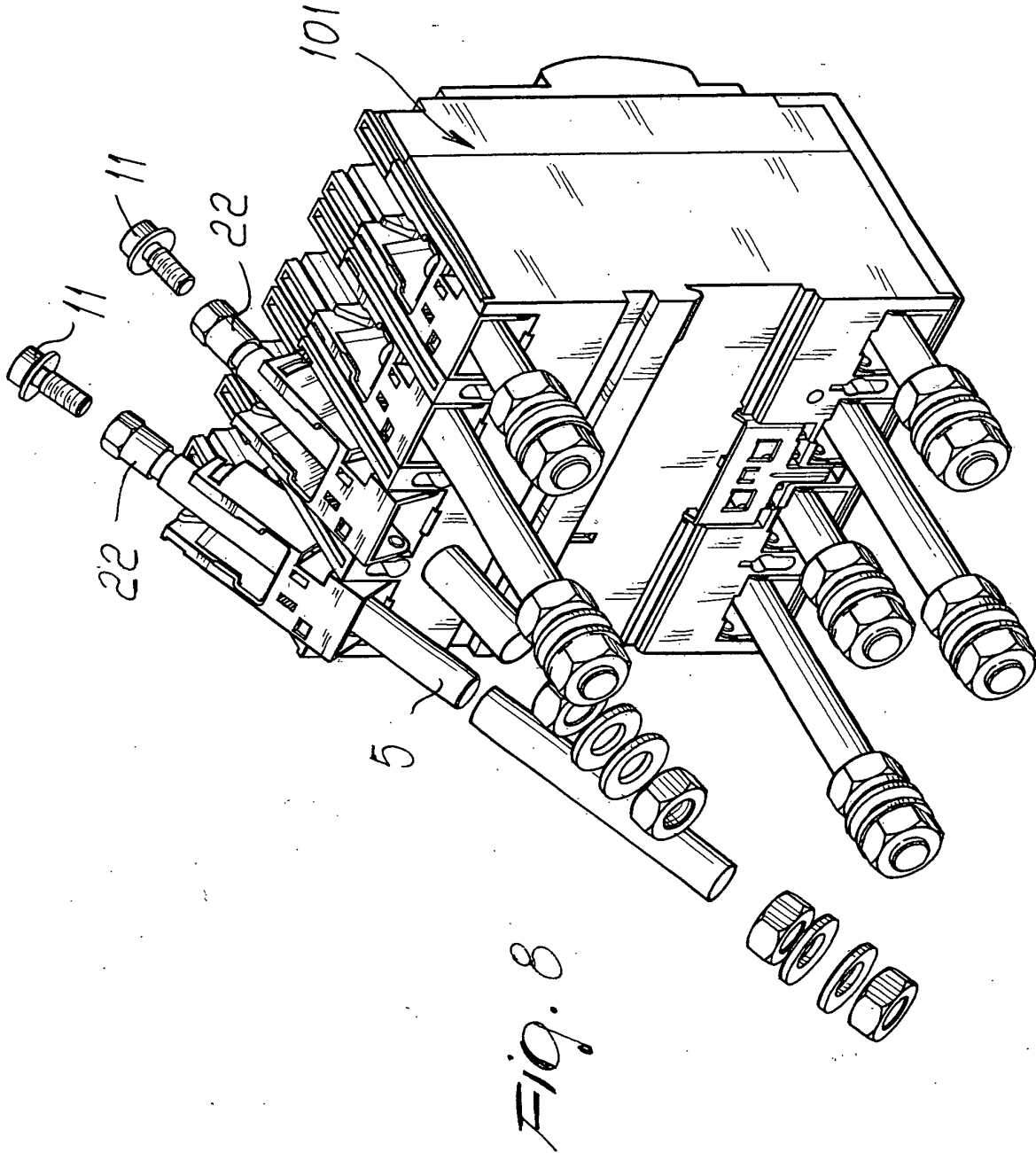


Fig. 7





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EUROPEAN SEARCH REPORT

Application Number
EP 02 01 1148

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	EP 0 908 915 A (SCHNEIDER ELECTRIC SA) 14 April 1999 (1999-04-14) * column 1, line 35 - column 2, line 10 *	1	H01H11/00
A	FR 2 786 360 A (LEGRAND SA) 26 May 2000 (2000-05-26) * abstract *	1	
A	WO 99 50873 A (LANG VOLKER ;SCHOLZ RUDOLF (DE); THAR RALF (DE); JOERGENS STEFAN () 7 October 1999 (1999-10-07) * abstract *	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7) H01H H01R
Place of search THE HAGUE		Date of completion of the search 26 August 2002	Examiner Libberecht, L
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03 R2 (P/45011)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 01 1148

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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26-08-2002

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 0908915	A	14-04-1999	FR	2769404 A1	09-04-1999
			CN	1216391 A	12-05-1999
			EP	0908915 A1	14-04-1999
			JP	11307948 A	05-11-1999
			US	6238254 B1	29-05-2001
FR 2786360	A	26-05-2000	FR	2786360 A1	26-05-2000
WO 9950873	A	07-10-1999	DE	19814400 C1	23-12-1999
			CN	1262776 T	09-08-2000
			WO	9950873 A1	07-10-1999
			EP	0986822 A1	22-03-2000
			JP	2000513496 T	10-10-2000
			US	6297718 B1	02-10-2001

EPC FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82