(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 109 264 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
20.06.2001 Bulletin 2001/25

(51) Int Cl.[7]: **H01R 13/44**

(21) Application number: **00311158.0**

(22) Date of filing: **12.12.2000**

(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

(30) Priority: **14.12.1999 ES 9902728**

(71) Applicant: **Power Controls Iberica, SL**
08225 Terrassa, Barcelona (ES)

(72) Inventors:
- **Martin Calvache, Ramon**
28298 Mostolos, Madrid (ES)
- **Rodriguez Lafuente, Juan Carlo**
28220 Majadohonda, Madrid (ES)
- **Fernandez del Rio, Jaime**
28033 Madrid (ES)

(74) Representative: **Goode, Ian Roy**
GE LONDON PATENT OPERATION,
Essex House,
12/13 Essex Street
London WC2R 3AA (GB)

(54) Terminal protector for multipolar electrical devices

(57) A terminal protector for multipolar electrical devices includes connecting terminals provided with screws that can be driven through respective holes (1) in the frame of the corresponding apparatus (3). A sheet (4) of insulating material is inserted in a groove (5) defined by the frame of the corresponding apparatus (3) in the zone of application terminals, the sheet (4) being provided with openings that match the arrangement of the access holes (1) to the screws of the connecting terminals. Adjacent to those openings (6) the respective blind zones (7) are defined in the same distribution as the access holes (1) to the screws (2) of the connecting terminals. The sheet (4) is capable of a sliding motion between the position in which the openings (6) match the access holes (1) to the terminal screws and another position in which the blind zones (7) close off the access holes (1).

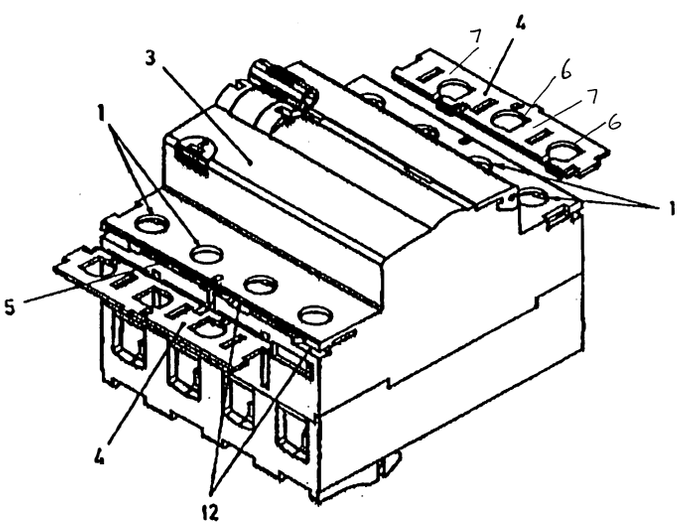

Fig.1

EP 1 109 264 A2

Description

[0001] This invention relates to a terminal protector for mulitpolar electrical devices.

[0002] Electrical devices of the automatic circuit breaker type and the like generally incorporate, for the electrical connections, terminals that are housed in the insulating frame of the device, with windows for insertion of the cables to be connected and access holes for driving the corresponding setscrews of the terminals.

[0003] This enables inlet and outlet connections to be made simply and effectively, the connections as well as the corresponding cables remaining duly separated and insulated, in order to avoided short-circuits. But, however, the access holes for the terminal screws remain exposed, which entails a risk, when the power supply is established, of dangerous contact with said screws, resulting in possible accidents.

[0004] In order to eliminate that problem, seal cap solutions have been developed, which, however, create problems of mounting for adequate fastening, raising the cost and rendering handling difficult for the installation of apparatus.

[0005] In accordance with this invention, a protection that eliminates those disadvantages is proposed, consisting of an element that is incorporated by simple fitting into the corresponding apparatus, in a sliding assembly that makes easy handling possible, with total safety of the protection for which it is intended.

[0006] This protector, object of the invention, consists of a sheet of insulating material, capable of fitting into a groove provided in each zone of inlet and outlet terminals of the application apparatus, said sheet having flanges that make mounting in the housing groove possible, then establishing a retention that prevents exit, with possible sliding motion of the sheet in that arrangement between each of the closing and opening positions of the terminal screw access holes.

[0007] The moving sheet is provided for such purpose with a series of openings that match the arrangement of the terminal screw access holes, said openings being adjacent to respective blind zones that follow the same arrangement, so that when the sheet is shifted toward one side in its mounting arrangement, its openings face the terminal screw access holes, leaving the access to said screws free, while when the sheet is moved toward the opposite side, the blind zones match the terminal screw access holes, thus preventing access to said screws.

[0008] On mounting, the sheet is totally housed in the frame of the device, the displacements for closing and opening of the terminal screw access holes in that concealed housing being determined without at any time projecting from same, so that the application device can be installed without the need for any free space for the protector on the installation site.

[0009] The movement of the sheet constituting the protector is easily attainable thanks to a small flange accessible from the outside, providing the sheet with a small holes that match one or more other holes in the frame of the device in the closing position of the terminal screw access holes, which makes possible the incorporation of a safety seal to prevent terminal access handling by unauthorized persons.

[0010] Therefore, this protector, object of the invention, certainly has some very advantageous features, acquiring a life of its own and a character preferable to that of other means for the function for which it is intended.

[0011] An embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 represents in perspective a circuit breaker equipped with the terminal protection covered by the invention, the protecting sheets having been represented in an outer position according to the arrangement for mounting.

Figures 2 and 3 are each plan views of the circuit breaker with the terminal protecting sheets inserted in their housing, said sheets in Figure 2 being in the position of free access to the terminal screws and in Figure 3 in the closing position of the corresponding holes.

Figures 4, 5 and 6 show an expanded bottom view, section and elevation respectively of a protecting sheet according to the invention.

[0012] The invention pertains to a terminal protector for multipolar devices, such as circuit breakers, automatic switches and the like, concretely in order to establish a closure of the access holes (1) for the screws (2) of the terminals of the inlet and outlet connections of the application apparatus (3).

[0013] The protector consists of a sheet (4) of insulating material, intended to fit into a groove (5) defined in the zone of corresponding terminals through the frame of the respective apparatus (3).

[0014] Said sheet (4) is provided with openings (6) that match the arrangement of the access holes (1) for the screws (2) of the connecting terminals, while adjacent to those openings (6) some respective blind zones (7) are defined, which in turn maintain the same relative arrangement as the access holes (1) for the screws (2) of the connecting terminals.

[0015] On fitting into the corresponding housing groove (5), the sheet (4) is in a sliding position toward the sides of the apparatus (3), with travel limits that prevent the ends of said sheet (4) from projecting outside, but with possible displacement between each of the positions, in one of which the openings (6) match the access holes (1) to the screws (2) of the terminals, leaving access to said screws (2) of the terminals free, as represented in Figure 2, while in the other position, the blind

zones (7) match the holes (1), closing off access to the terminal screws (2), as represented in Figure 3.

[0016] Accordingly, the protecting sheet (4) constitutes a moving slide in the zone of application, and can be displaced between the opening and closing positions of the access holes (1) to the screws (2) of the connecting terminals, in order to make possible the operation of said screws (2) and to block access to same once the connections are made.

[0017] To activate the displacement between the two positions indicated, the sheet (4) is provided on the front edge with a small flange (8), accessible from outside, the sheet (4) being further provided with a small hole (9) which, in the position in which the blind zones (7) close off the holes (1), matches one or more other respective holes (10) in the frame of the apparatus (3), making possible the placement of a safety cap, to prevent any unauthorized person from moving the sheet (4) and leaving access to the terminal screws (2) free.

[0018] The sheet (4) is further provided with some perpendicular flanges (11) on the back edge, which fit into a guide groove inside when the sheet (4) is introduced in the housing groove (5), establishing a retention that prevents the free extraction of the sheet (4) once inserted, but without impeding the displacement between the closing and opening positions of the holes (1).

[0019] In order to make possible the insertion of the assembly in the groove (5), some recesses (12) are provided, with which the flanges (11) of the sheet (4) can be matched, in order to make the insertion with a forced push, until the said flanges (11) fit into the interior guide groove.

Claims

1. Terminal protector for multipolar electrical devices, of the type comprising connecting terminals provided with screws (2) that can be driven through the respective holes (1) in the frame of the corresponding apparatus (3), including a sheet (4) of insulating material, which is inserted in a groove (5) defined by the frame of the corresponding apparatus (3) in the zone of application terminals, said sheet (4) being provided with openings (6) that match the arrangement of the access holes (1) to the screws (2) of the connecting terminals, while adjacent to those openings (6) the respective blind zones (7) are defined in the same distribution as the access holes (1) to the screws (2) of the connecting terminals, the said sheet being capable of a sliding motion between the position in which the openings (6) match the access holes (1) to the terminal screws (2) and another position in which the blind zones (7) close off said holes (1).

2. Terminal protector for multipolar electrical devices in accordance with claim 1, wherein the sheet (4) possesses a perpendicular flange (11) on the back edge, which fits into an interior guide groove, preventing the free extraction of said sheet (4) after coupling insertion in the groove (5).

3. Terminal protector for multipolar electrical devices in accordance with claims 1 or claim 2, wherein a recess (12) is provided in the groove (5), with which the flange (11) of the sheet (4) can be matched, for coupling insertion through forced pushing.

4. Terminal protector for multipolar electrical devices in accordance with claim 1, wherein the sheet (4) possesses a flange (8) on the front edge, which is accessible from outside in the mounting position, in order to make the said sheet (4) move between the two functional positions of same.

5. Terminal protector for multipolar electrical devices in accordance with claim 1, wherein the sheet (4) possesses a small hole (9), which matches one or more other respective holes (10) of the frame of the application apparatus (3), in the position in which the access holes (1) to the terminal screws (2) are closed off by the blind zones (7), making possible the placement of the safety cap to prevent the opening of access to the screws (2) by unauthorized persons.

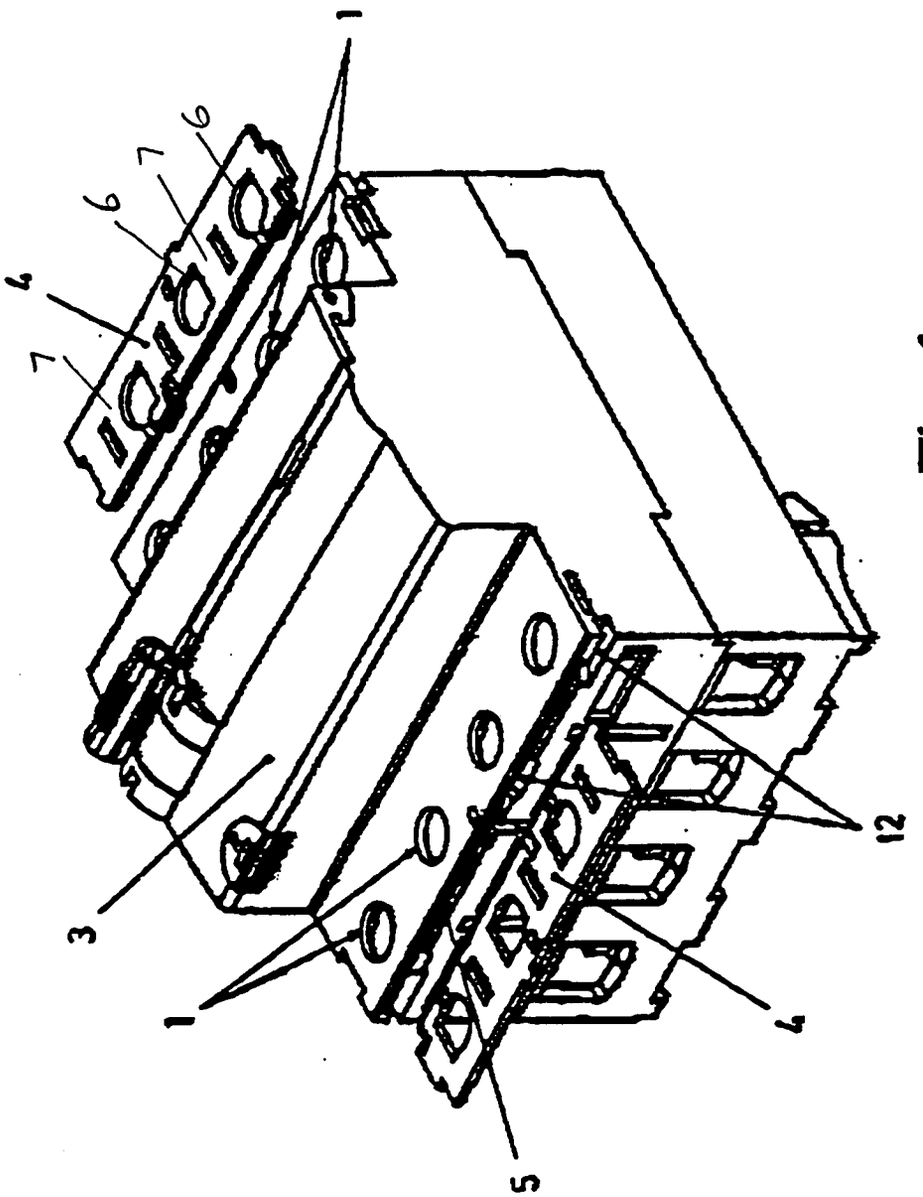

Fig.1

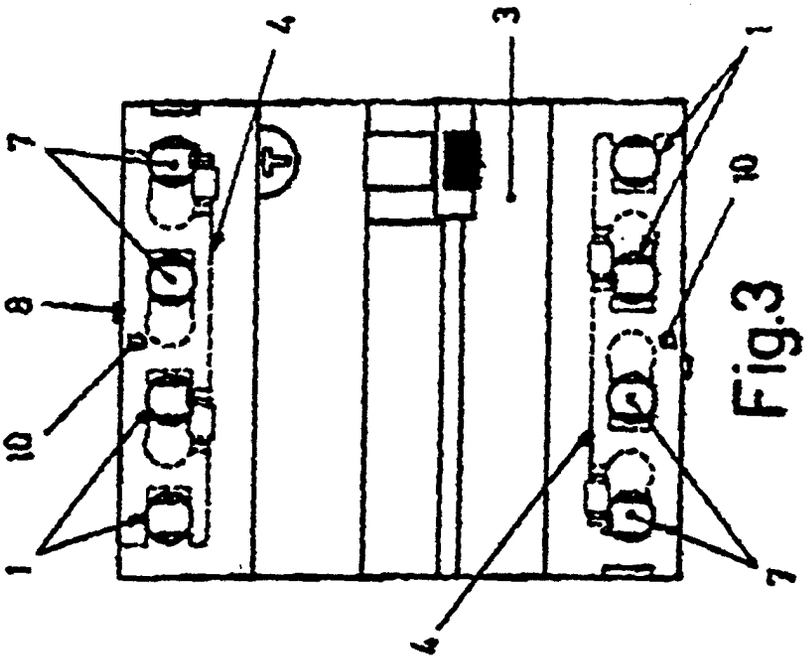

Fig.3

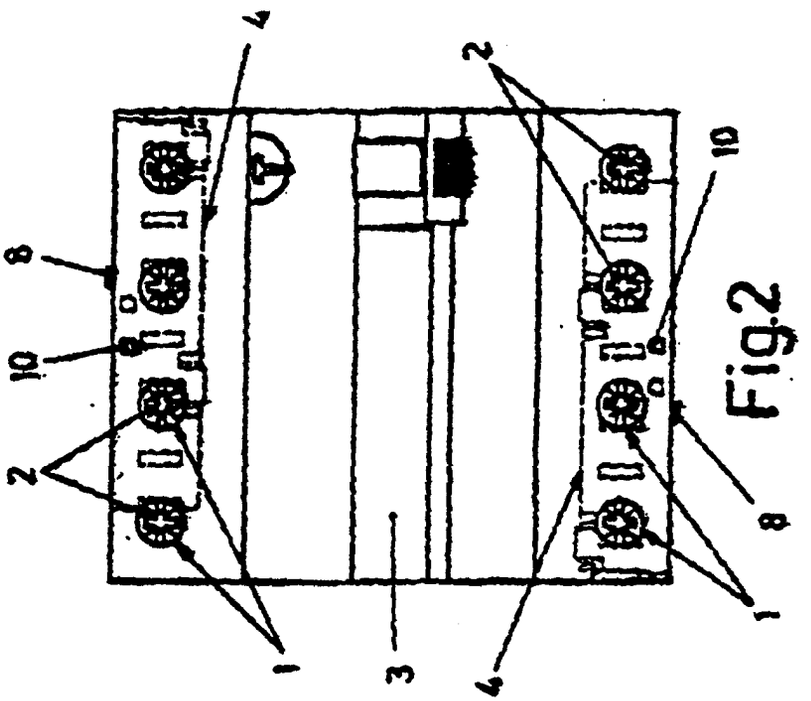

Fig.2

Fig.5

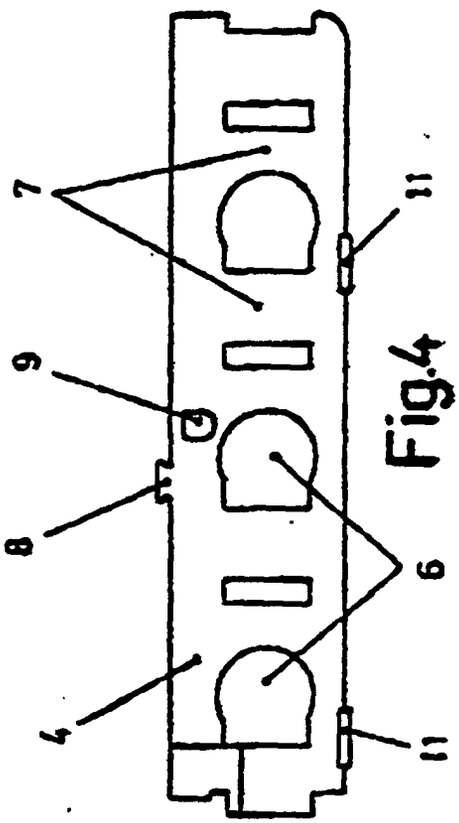

Fig.4

Fig.6