



(11)

**EP 1 109 264 B1**

(12)

**EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention  
of the grant of the patent:  
**07.03.2007 Bulletin 2007/10**

(51) Int Cl.:  
**H01R 13/44 (2006.01)**

(21) Application number: **00311158.0**

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

**(54) Terminal protector for multipolar electrical devices**

Schutzeinrichtung für Kontakte multipolarer elektrischer Geräte

Dispositif de protection des terminaux de dispositifs électriques multipolaires

(84) Designated Contracting States:  
**DE ES FR IT**

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

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

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## Description

**[0001]** This invention relates to a terminal protector for multipolar 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 avoid 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]** Document GB 2171564 discloses a terminal protector according to the preamble of claim 1.

**[0006]** 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.

**[0007]** 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.

**[0008]** 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.

**[0009]** 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.

**[0010]** 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.

**[0011]** 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.

**[0012]** 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.

**[0013]** 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).

**[0014]** 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).

**[0015]** 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.

**[0016]** 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.

[0017] 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.

[0018] 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.

[0019] 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).

[0020] 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, **characterised in that** adjacent to those openings (6) 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.

## Patentansprüche

1. Schutzeinrichtung für Anschlüsse multipolarer elektrischer Einrichtungen der Bauart mit Anschlussverbindern, die mit Schrauben (2) versehen sind, die durch entsprechend in dem Gestell der entsprechenden Einrichtung (3) ausgebildete Löcher (1) betätigbar sind, mit einer Platte (4) aus isolierendem Material, die in eine Nut (5) eingesetzt werden kann, die in dem Gestell der entsprechenden Einrichtung (3) in dem Bereich der Anschlüsse ausgebildet ist, wobei die Platte (4) mit Öffnungen (6) versehen ist, die zu der Anordnung der Zugangslöcher (1) für die Schrauben (2) der Verbindungsanschlüsse passt, **dadurch gekennzeichnet, dass** zu den Öffnungen (6) benachbart Blindzonen (7) in der gleichen Anordnung wie die Zugangslöcher (1) für die Schrauben (2) der Verbindungsanschlüsse definiert sind, wobei die Platte zwischen der Position, in der die Öffnungen (6) zu den Zugangslöchern (1) für die Anschlusschrauben (2) passt, und einer anderen Position verschiebbar ist, in der die Blindzonen (7) die Löcher (1) schließen.

2. Schutzeinrichtung für Anschlüsse multipolarer elektrischer Einrichtungen gemäß Anspruch 1, wobei die Platte (4) an der hinteren Kante einen rechtwinkligen Flansch (11) aufweist, der in eine innere Führungs-

nut passt und das freie Herausziehen der Platte (4) nach dem kuppelnden Einsetzen in die Nut (5) verhindert.

3. Schutzeinrichtung für Anschlüsse multipolarer elektrischer Geräte gemäß Anspruch 1 oder 2, wobei in der Nut (5) eine Ausnehmung (12) vorgesehen ist, an die der Flansch (11) der Platte (4) angepasst werden kann, um beim Einsetzen eine Befestigung durch gewaltsames Einschieben zu bewirken. 5
4. Schutzeinrichtung für Anschlüsse multipolarer elektrischer Geräte gemäß Anspruch 1, wobei die Platte (4) an der Vorderkante einen Flansch (8) aufweist, der in der Montageposition von außen zugänglich ist, um die Platte (4) zwischen zwei Funktionspositionen bewegen zu können. 10
5. Schutzeinrichtung für Anschlüsse multipolarer elektrischer Einrichtungen gemäß Anspruch 1, wobei die Platte (4) ein kleines Loch (9) aufweist, das zu einem oder mehreren anderen entsprechenden Löchern (10) in dem Grundgestell des entsprechenden Geräts (3) in der Position passt, in der die Zugangsöffnungen (1) zu den Anschlussschrauben (2) durch die Blindzonen (7) geschlossen sind, was es möglich macht, eine Sicherheitskappe anzubringen, um zu verhindern, dass die Zugangsöffnungen zu den Schrauben (2) durch unautorisierte Personen geöffnet werden. 20 25 30

sur le bord arrière, qui s'adapte dans une rainure de guidage intérieure, empêchant l'extraction libre de ladite feuille (4) après l'insertion d'accouplement dans la rainure (5).

3. Protecteur de bornes pour dispositifs électriques multipolaires selon la revendication 1 ou la revendication 2, dans lequel une cavité (12) est réalisée dans la rainure (5), avec laquelle peut être adapté le flasque (11) de la feuille (4), pour une insertion d'accouplement par poussée en force.
4. Protecteur de bornes pour dispositifs électriques multipolaires selon la revendication 1, dans lequel la feuille (4) possède un flasque (8) sur le bord avant, qui est accessible à partir de l'extérieur dans la position de montage, de façon à faire se déplacer ladite feuille (4) entre les deux positions de fonctionnement de celle-ci.
5. Protecteur de bornes pour dispositifs électriques multipolaires selon la revendication 1, dans lequel la feuille (4) possède un petit trou (9), qui s'adapte avec un ou plusieurs autres trous respectifs (10) du bâti de l'appareil d'application (3), dans la position dans laquelle les trous d'accès (1) aux vis de borne (2) sont fermés par les zones aveugles (7), rendant possible la disposition du capuchon de sécurité afin d'empêcher l'ouverture de l'accès aux vis (2) par des personnes non autorisées.

## Revendications

1. Protecteur de bornes pour dispositifs électriques multipolaires, du type comprenant des bornes de connexion munies de vis (2) qui peuvent être vissées à travers les trous respectifs (1) dans le bâti de l'appareil correspondant (3), comprenant une feuille (4) de matériau isolant, qui est insérée dans une rainure (5) définie par le bâti de l'appareil correspondant (3) dans la zone des bornes d'application, ladite feuille (4) étant munie d'ouvertures (6) qui correspondent à l'agencement des trous d'accès (1) pour les vis (2) des bornes de connexion, **caractérisé en ce qu'**au voisinage de ces ouvertures (6), des zones aveugles respectives (7) sont définies selon la même distribution que les trous d'accès (1) pour les vis (2) des bornes de connexion, ladite feuille étant susceptible d'effectuer un mouvement de glissement entre la position dans laquelle les ouvertures (6) correspondent aux trous d'accès (1) pour les vis de borne (2) et une autre position dans laquelle les zones aveugles (7) ferment lesdits trous (1). 35 40 45 50 55
2. Protecteur de bornes pour dispositifs électriques multipolaires selon la revendication 1, dans lequel la feuille (4) possède un flasque perpendiculaire (11)

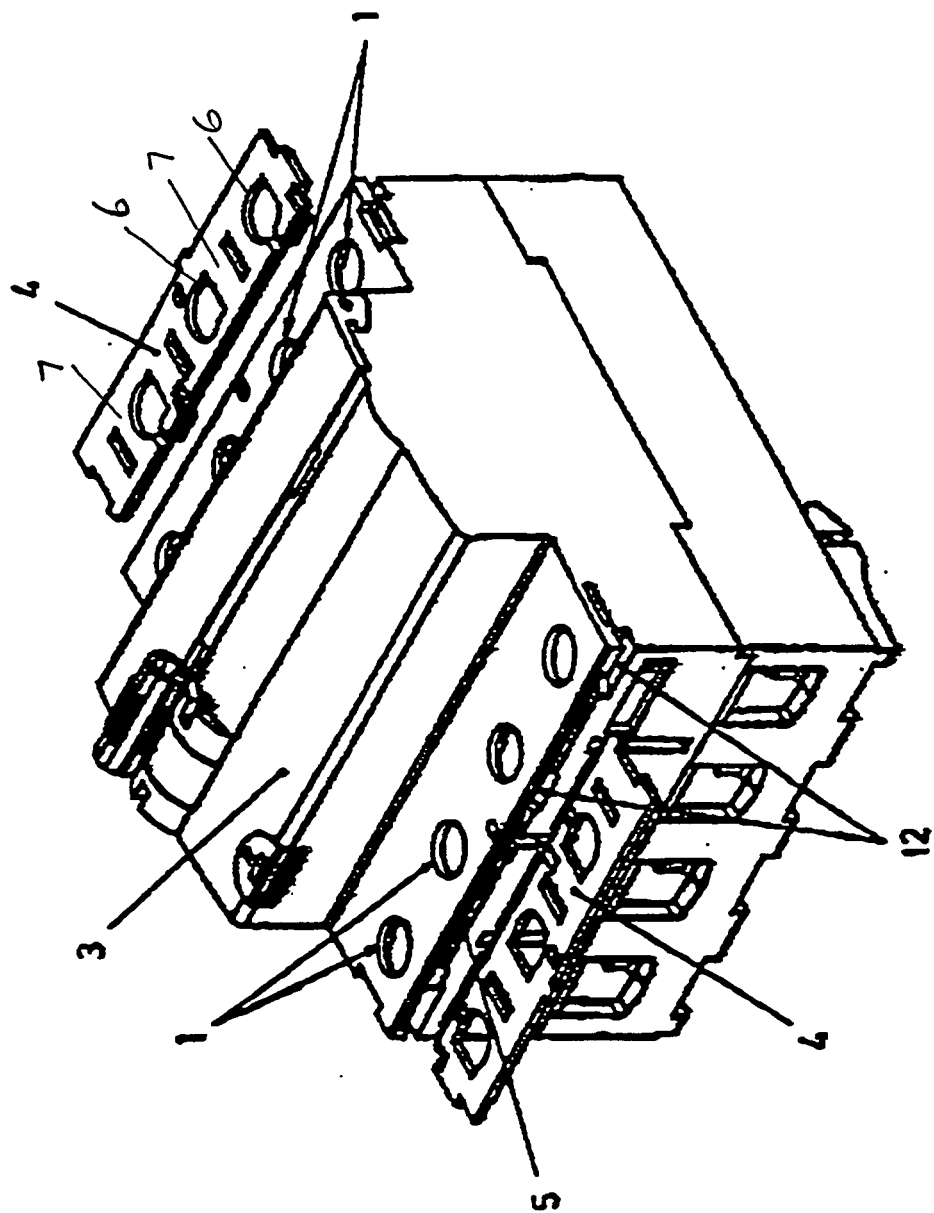
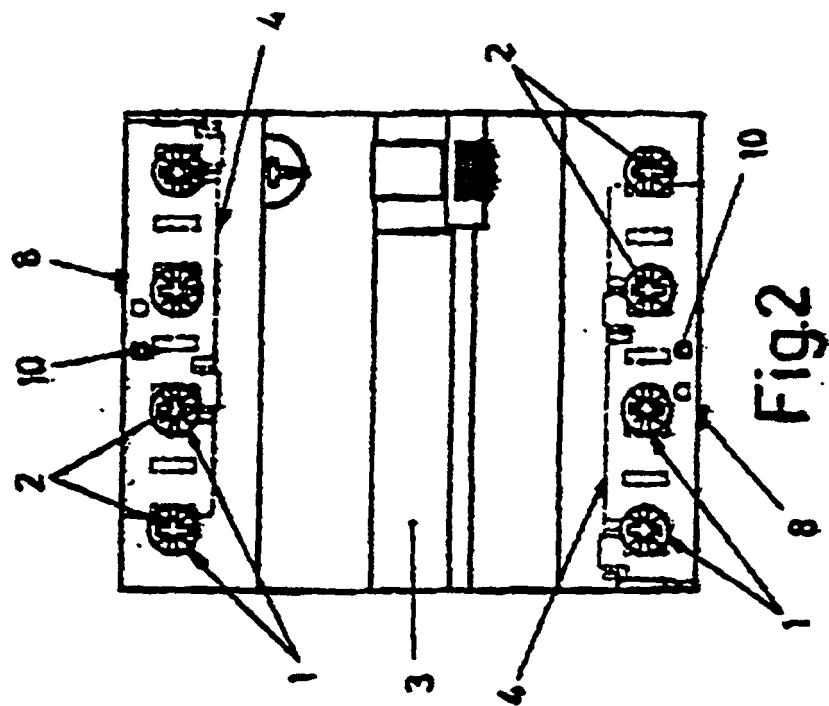
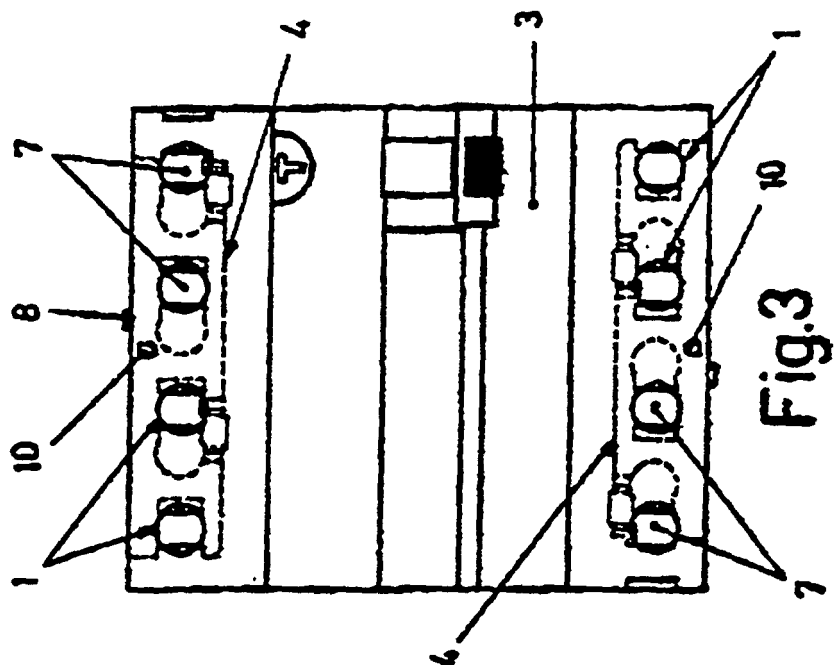


Fig.1



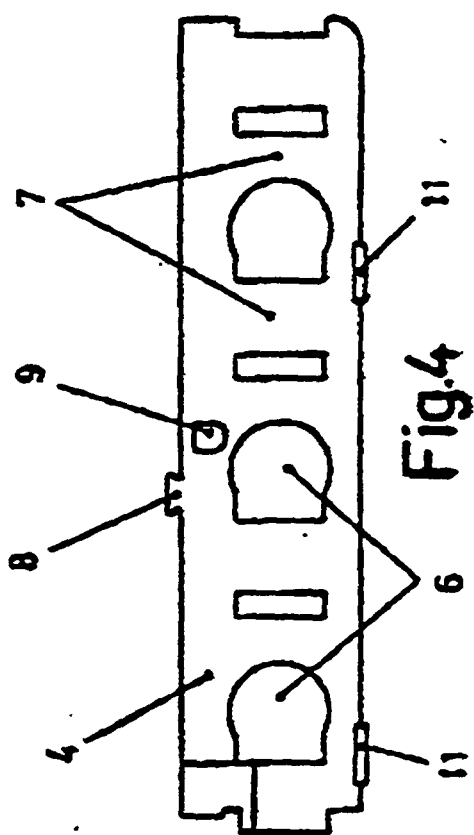


Fig. 5

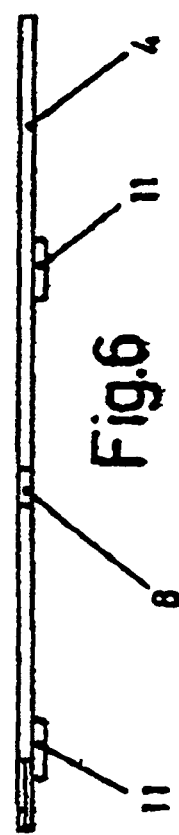


Fig. 6