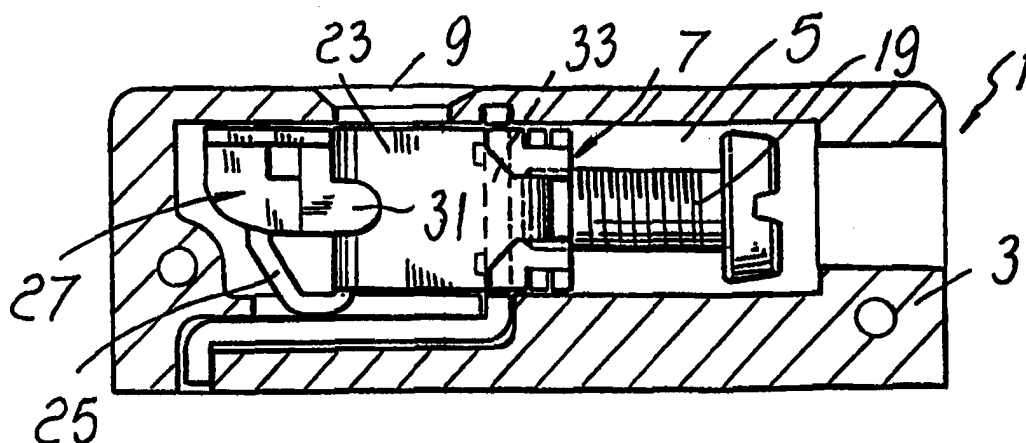




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/EP98/02559</p> <p>(22) International Filing Date: 30 April 1998 (30.04.98)</p> <p>(30) Priority Data: MI97U000354 20 May 1997 (20.05.97) IT</p> <p>(71) Applicant (for all designated States except US): GEWISS S.P.A. [IT/IT]; Via A. Volta, 1, I-24069 Cenate Sotto (IT).</p> <p>(72) Inventors; and (75) Inventors/Applicants (for US only): BOSATELLI, Domenico [IT/IT]; Via Degli Alpini, 13, I-24069 Cenate Sotto (IT). CONTARDI, Augusto [IT/IT]; Via Rovani, 7, I-21100 Varese (IT). PIANEZZOLA, Sergio [IT/IT]; Via della Fratellanza, 21, I-21100 Calcinatate del Pesce (IT).</p> <p>(74) Agent: FORATTINI, Amelia; Internazionale Brevetti Ingg. Zini, Maranesi &amp; C. s.r.l., Piazza Castello, 1, I-20121 Milano (IT).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b> With international search report.</p>

(54) Title: ELECTRICAL TERMINAL WITH FINGER-PROOF PROTECTION



## (57) Abstract

An electrical terminal with finger-proof protection includes a body (7) which can slide within a seat (5) which is suitable to accommodate the end of an electrical conductor (11) to be connected; the seat has a longitudinal transverse opening (9) for the insertion of the electric conductor and the sliding body has an actuation screw (19) for its sliding within the seat and at least one lower wall (21) which is provided with an edge and is suitable to cooperate with a fixed contact (33) which is rigidly coupled to the seat in order to clamp the electrical conductor. A diaphragm member (29) is rigidly associated with the slider below the edge of wall (21) and is suitable to at least partially block the opening after the electric conductor has been inserted in the seat and clamped between the fixed contact and the lower wall of the slider.

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## ELECTRICAL TERMINAL WITH FINGER-PROOF PROTECTION

The present invention relates to an electrical terminal with finger-proof protection.

There are many electrical devices provided with connecting  
5 terminals generally constituted by a slider which is actuated by a screw and is suitable to press the end of a wire in contrast with a fixed part which is rigidly coupled to the body of the device. The slider generally moves within a seat provided with a transverse hole for the insertion of  
10 the end of the wire and with an axial hole for accessing the head of the screw by means of a conventional screwdriver.

A problem of conventional terminals is that the transverse hole, which must be substantially larger than the cross-  
15 section of the wire, remains open even after the terminal has been closed and the wire has been secured inside it.

Another problem of conventional terminals is due to the fact that it is possible to mistakenly insert the wire outside  
20 the moving body, preventing correct engagement of the end.

Terminals have been proposed which have a diaphragm which is rigidly coupled to the sliding body and is suitable to partially close the opening once the terminal has been  
25 tightened.

A significant drawback of these terminals is that they entail an additional part to be assembled, making it more complicated and expensive to manufacture the electrical  
30 device.

Another drawback is that the diaphragm partially overlaps the edge of the sliding part, preventing the abutment of the sheath of the electric wire against the moving part of the terminal. In other words, it has been found that the partial  
5 protection of the edge of the slider by the diaphragm does not allow to insert the wire fully in the seat.

The aim of the present invention is to provide an electrical terminal with finger-proof protection, particularly for  
10 electrical devices, in which the wire insertion opening remains substantially closed once the wire has been secured.

An object of the invention is to provide a terminal which is constructively very simple.

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A further object is to provide a terminal which can be assembled easily and in a manner which is substantially similar to that of conventional terminals without significantly increasing production times and costs.

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A further object is to provide a terminal whose use is extremely simple and entirely similar to the use of conventional terminals.

25 This aim, these objects and others which will become apparent hereinafter are achieved by an electrical terminal with finger-proof protection comprising a body which can slide within a seat which is suitable to accommodate the end of an electrical conductor to be connected, the seat having  
30 a longitudinal transverse opening for the insertion of the

electric conductor, the sliding body having an actuation means for its sliding within the seat and at least one lower wall which is provided with an edge and suitable to cooperate with a fixed contact member which is rigidly coupled to the seat in order to clamp the electrical conductor; characterized in that it comprises a diaphragm member which is rigidly associated with the sliding body below the edge and is suitable to at least partially block the opening after the electric conductor has been inserted in the seat and clamped between the fixed contact and the wall of the slider.

Further characteristics and advantages will become apparent from the description of the terminal, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Fig. 1 is a lateral sectional view of the terminal according to the invention;

Fig. 2 is a sectional view, similar to Fig. 1, taken along a different plane which is substantially median with respect to the sliding body;

Fig. 3 is a front view of the terminal according to the invention; and

Fig. 4 is a perspective view of the terminal according to the invention.

With reference to the above figures, the terminal with finger-proof protection, according to the invention, generally designated by the reference numeral 1, includes an insulating body 3 which can be an integral part of an electrical device (not shown), such as for example a breaker, which forms a seat 5 for a sliding body or slider 7.

The seat 5 has at least one opening 9 for the insertion of an electrical conductor, such as for example an end 11, with the sheath 15 removed, of an electric wire 13.

The slider 7 is advantageously formed monolithically by bending a metal strip so as to form a parallelepiped with an upper wall 17 which is perforated and threaded in order to receive an actuation screw 19 and with a lower wall 21 which is connected to the upper face by two side walls 23. The lower wall 21 has a front edge and a hook 25, advantageously obtained from the metal strip, which is suitable to lock an insulating member 27 which is arranged outside the face 21 and is provided with a front side 29 which faces the opening 9. The insulating member 27 advantageously has two wings 31 adapted to cooperate with recesses formed partially on the edges of the lower wall 21 and on the side walls 23 of the slider.

The operation of the terminal according to the invention is evident. The end 11 of the wire 13 is inserted through the opening 9 into the slider 7 between the lower wall 21 and a fixed contact 33 which is rigidly coupled to the body 3. By

actuating the screw 19, the slider 7 is moved toward the fixed contact 33 and the end 11 of the wire is clamped between the lower wall 21 of the slider and the fixed contact 33. In the clamping position, shown in Fig. 2, the front side 29 of the insulating member 27 constitutes a diaphragm and obstructs the opening 9 so as to prevent the accidental insertion of a finger, for example.

Since the insulating member 27 is rigidly coupled to the slider 7, assembly of the terminal according to the invention is very easy and assembly of the insulating member 27 on the slider is also very simple by virtue of the hook 25, which allows the part to be snap-fitted to the slider with a very simple movement.

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Furthermore, as clearly shown in Fig. 2, since the front side 29 of the insulating member 27 does not cover the edge of the lower wall 21 of the slider, it is possible, by correctly preparing the end of the wire 13, to place the sheath 15 of the wire in abutment against the outer edge of the lower wall 21 of the slider and against the outer edge of the opening 9, so as to leave no externally accessible portion of the end 11.

25 In practice it has been found that the invention achieves the intended aim and objects.

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

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Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have  
5 any limiting effect on the scope of each element identified by way of example by such reference signs.

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CLAIMS

1. Electrical terminal with finger-proof protection comprising a body (7) which can slide within a seat (5) which is suitable to accommodate the end of an electrical conductor (11) to be connected, said seat (5) having a longitudinal transverse opening (9) for the insertion of said electric conductor (11), said sliding body having an actuation means (19) for its sliding within said seat and at least one lower wall (21), provided with a front edge, and suitable to cooperate with a fixed contact member (33) which is rigidly coupled to said seat in order to clamp said electrical conductor; characterized in that it comprises a diaphragm member (29) which is rigidly associated with said slider (7) below said lower wall (21) and is suitable to at least partially block said opening after said electric conductor has been inserted in said seat and clamped between said fixed contact and said surface of said slider.

2. Terminal according to claim 1, characterized in that said slider (7) is formed monolithically by bending a metal strip so as to form a parallelepiped provided with an upper wall (17), which is perforated and threaded in order to receive an actuation screw (19), and a lower wall (21), which is connected to the upper wall by two side walls.

3. Terminal according to claim 1 or 2, characterized in that said lower face of said slider has a hook (25) which is obtained from said metal strip and is suitable to lock an insulating member (27) which is arranged externally with

respect to the lower wall (21) and has a front side (29) which faces said opening (9).

4. Terminal according to one or more of the preceding  
5 claims, characterized in that said insulating member (27) has two wings (31) adapted to cooperate with recesses formed partially on the edges of the lower wall (21) and on the side walls (23) of the slider.

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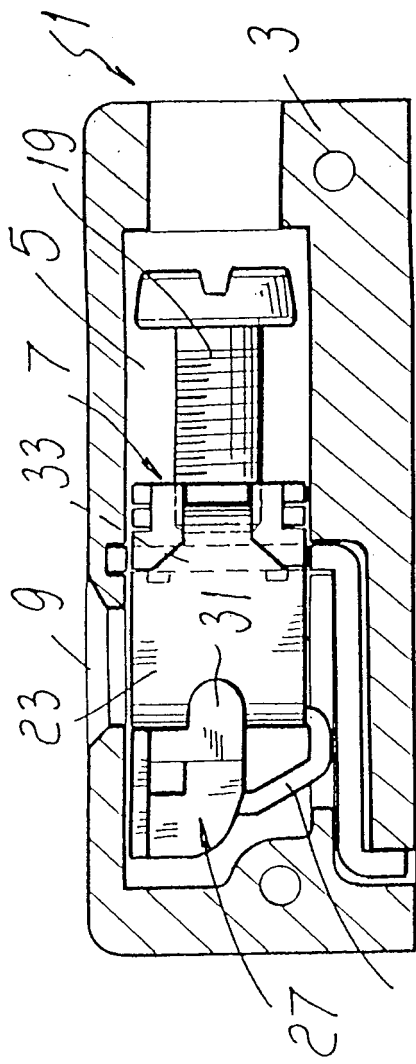


FIG. 1

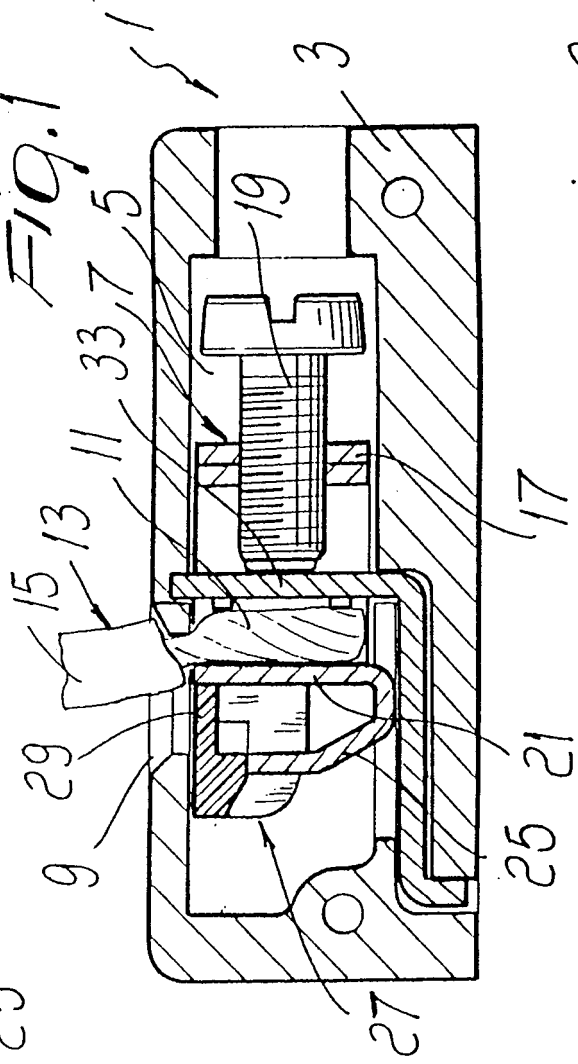


FIG. 2

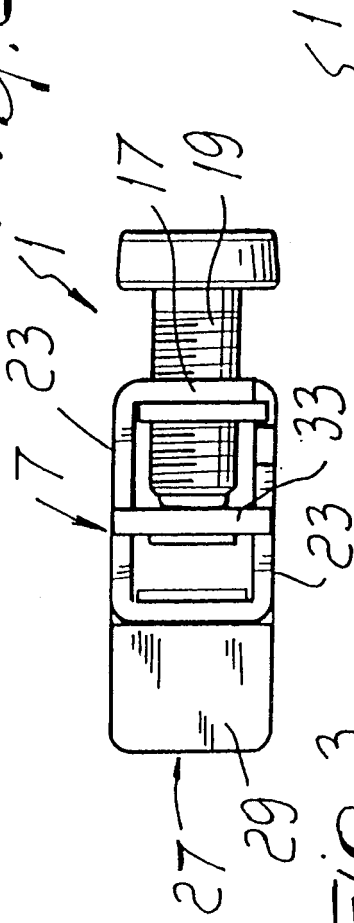


FIG. 3

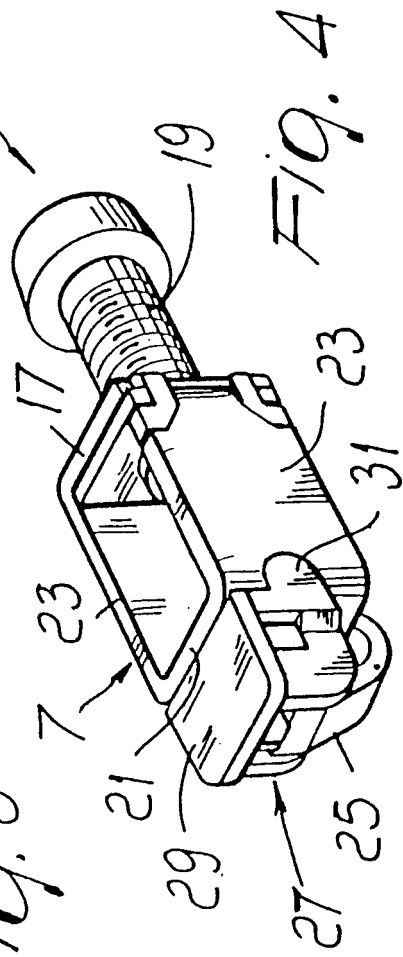


FIG. 4

# INTERNATIONAL SEARCH REPORT

Intern al Application No PCT/EP 98/02559
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**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC 6 H01H9/02 H01R4/38

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
 IPC 6 H01H H01R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 738 676 A (LEGRAND SA) 14 March 1997 see page 1 - page 11; figures 1-7 ---	1,2,4
X	EP 0 683 498 A (LEGRAND SA ;LEGRAND SNC (FR)) 22 November 1995 see column 4, line 32 - column 8; figures 1-3 ---	1,2,4
X,P	US 5 739 467 A (FABRIZI FABRIZIO) 14 April 1998 see column 1 - column 3; figures 1,2 ---	1,2,4
A	FR 2 612 340 A (MERLIN GERIN) 16 September 1988 see page 5, paragraph 2; figures 1-8 -----	3

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