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(54) **Integrated terminal block fixedly associated with a plug**

Integrierter Anschlussblock zusammenhängend mit Stecker

Bloc de raccordement intégré associé rigidement à une fiche

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(56) References cited:

EP-A- 0 129 424

EP-A- 0 368 074

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Description

BACKGROUND OF THE INVENTION

The present invention relates to an integrated terminal block construction fixedly associated with an electric plug.

As is known, a very great problem to be solved in making electrical apparatus and, more specifically, household electrical apparatus and appliances is that of easily performing the electrical connections between the electrical cable coupling the apparatus to the electric mains and the inner wires of the apparatus.

At present very great problems are, in particular, encountered for properly connecting the cable to the plug since it is necessary to perform coupling operations which require a comparatively long time thereby greatly increasing the labour cost.

SUMMARY OF THE INVENTION

Accordingly, the aim of the present invention is to solve the above mentioned problem by providing an integrated terminal block construction, fixedly connected to an electric plug, which can be directly coupled to the housing of the electric apparatus, while providing an easy access to the electric contacts for the connection of the inner electric elements of the apparatus, and being simultaneously already coupled to the plug for coupling the apparatus to the mains.

Within the scope of the above mentioned aim, a main object of the present invention is to provide such a terminal block construction which allows to make very simple connection operations and which, moreover, provides very accurate low contact resistance electrical connections.

Another object of the present invention is to provide such an integrated terminal block construction, which is very safe and reliable in operation.

Yet another object of the present invention is to provide such a terminal block construction which can be easily made starting from easily available elements and materials and which, moreover, is very competitive from a mere economic standpoint.

The document EP-A-0 129 424, discloses an integrated terminal block arrangement according to the preamble of the main claim. In particular, this prior terminal block arrangement comprises a terminal block body coupled to an electric cable associated with an electric plug, said terminal block further comprising, on a surface thereof, electric contacts which are coupled with the wires of said electric cable, said terminal block body also including means for coupling said body to a supporting sheet metal plate with which the ground contact of said terminal block arrangement can be associated.

The document EP-A-0 368 074 discloses a plug assembly which can be coupled to a supporting wall by resilient latching means cooperating with an edge por-

tion of a window formed in said supporting wall.

According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by an integrated terminal block construction, according to the main claim.

BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and advantages of the present invention will become more apparent hereinafter from the following detailed disclosure of a preferred, though not exclusive, embodiment thereof, which is illustrated, by way of an indicative but not limitative example, in the figures of the accompanying drawings, where:

Figure 1 illustrates a perspective view of the terminal block construction according to the present invention, as seen from the electric contact side thereof;

Figure 2 is another perspective view of the subject terminal block construction, seen from the side opposite to the electric contact side thereof;

Figure 3 is a schematic cross-sectional view showing the terminal block construction applied to a supporting sheet metal plate;

Figure 4 illustrates a window arrangement to be made through the supporting sheet metal plate;

Figure 5 illustrates a possible wiring or connection arrangement of the power supply electric cable and the electric contacts;

Figure 6 is a schematic side elevation view illustrating means for coupling or latching the terminal block to the sheet metal supporting plate;

Figure 7 is a front view of the electric contacts;

Figure 8 illustrates a terminal block construction according to the invention including an electric plug holder seat, seen from the electric contact side thereof;

Figure 9 illustrates a terminal block construction according to the present invention including electric plug holder seats or housings, seen from the side opposite to the electric contact side thereof; and

Figure 10 is a schematic side view illustrating the terminal block construction according to the invention applied to the supporting sheet metal plate therefor and with the electric plug thereof being schematically represented in its assembled condition.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the figures of the drawings, the integrated terminal block construction, fixedly coupled to an electric plug, generally indicated at the reference number 1, is provided with a terminal block body 2, made of a plastic material which, advantageously, is connected to an electric cable 3 which in turn can be

fixedly coupled to an electric plug for connection with the electric mains.

The terminal block body 2 is provided with lug elements 4 (Fig. 7) for locking the cable, provided for preventing said cable from accidentally disengaging from the terminal block body 2.

On a surface thereof, the terminal block body 2 is provided with a plurality of electric contacts, generally of the so-called "Faston®" type, which can be separated, for each pole, by separating elements 15 made of an electrically insulating plastic material, or they can also receive a coupling movable portion either of a single or multiple type.

Advantageously, each contact 10 has a U-shape configuration with two arms 11 of Faston® shape, said arms 11 being connected at the central portion thereof by a bridging element 12 (Fig. 7) in which, by a cutting operation, is separated an intermediate portion, indicated at 12a, which can be spread apart with respect to the remaining portions so as to provide a passage therein the conductors 3a of the cable can be engaged and locked in the engaged position by mechanically deforming the central portion 12a.

Thus, it is possible to make a very accurate and efficient electric contact, and, moreover, the assembling time is greatly reduced.

The terminal block body is moreover provided with coupling or latching means for connecting it to a shaped window arrangement 20, which is formed through the holding sheet metal material or housing of the apparatus to which the terminal block must be connected.

Said coupling or latching means are provided with a cut-out seat 25 (Fig. 3), formed in the bottom portion thereof, which will be practically arranged bridging an edge portion of the window arrangement, whereas, at the other side, there is provided a resilient lug 26 (Figs. 6, 10) including a locking tooth element 27 and a projection 28 which outwardly projects and which allows a tool to be engaged therein in order to obtain, if required, the disengaging thereof.

Moreover, said terminal block body is further provided with a laterally projecting plate 30 (Fig. 9), for providing a ground contact, which is directly performed by restraining it on the sheet metal 21 which, advantageously, can comprise a plurality of holes 31 for applying fixing screws or rivets.

As shown in figures 8 to 10, the above disclosed terminal block can also be provided, on its portion opposite to the electric contact portion, with plug holder seats 40 for receiving the electric plug for connecting the apparatus to the mains, as the electric cable is disengaged from the power supply mains, thereby preventing the cable from being held in a free condition.

In a preferred embodiment, in the terminal block body there are provided two seats or recesses, corresponding to the plug elements of the electric plug, which will allow the electric plug to be properly removably restrained in its condition coupled to the electric cable.

The number of the contacts provided on the front face, as well as the mutual arrangement thereof, can be varied according to the requirements.

From the above it should be apparent that the invention fully achieves the intended aim and objects.

In particular, the fact is to be pointed out that an integrated terminal block construction has been provided which is fixedly coupled to an electric plug and which can be assembled in a very reduced time owing to the provision of the window arrangement and on which, moreover, there is already provided the ground contact.

Moreover, another important aspect of the present invention is that the wires of the electric cable are clamped to the central portion of the Faston-type contacts, which have a U-shape, by exploiting a cut-out of the central portion which, practically, defines a passage therein the conductor can be restrained.

20 Claims

1. An integrated terminal block construction (1), fixedly connected to an electric plug, in particular for coupling to a sheet metal plate of a household electrical apparatus, comprising a terminal block body (2) coupled to an electric cable (3) associated with an electric plug, said terminal block body (2) also including latching means for coupling said body to said sheet metal plate with which a ground plate contact (30) of said terminal block construction can be associated, characterized in that said terminal block construction (1) further comprises a plurality of electric contacts (10) aligned in parallel rows, each said contact having a substantially U-shape configuration with two parallel arms (11) of blade-like shape, said arms (11) being connected by pairs by a bridging element (12) in which an intermediate portion is provided (12a) in which portion a slit is provided; said slit defining two sides able to be spread apart so as to provide a passage therein for respective conductors (3a) of said electric cable (3), said intermediate portion (12a) being capable to be mechanically deformed to lock therein said conductors (3a); said contacts being separated, in said rows, for each pole, by electrically insulating plastic walls (15).
2. A terminal block construction according to Claim 1, characterized in that said cable (3) is coupled to said terminal block body (2) by means of lugs (4) shaped such as to be able to prevent any disengagement of said cable.
3. A terminal block construction according to one or more of the preceding claims, characterized in that said latching means are provided with a cut-out seat (25) which can be arranged in a bridging relationship on an edge portion of a window arrangement

(20) formed through said sheet metal plate of said household electrical apparatus; on the side thereof opposite to said cut-out seat (20) being moreover provided a resilient tooth element (27) able to enter in abutment engagement against said sheet metal plate; said tooth element (27) being provided with a projection (28) able to be engaged by a tool for disengaging said terminal block body (2) from said sheet metal plate.

4. A terminal block construction according to one or more of the preceding claims, characterized in that near said window arrangement (20) at least a hole (31) is formed for coupling said ground contact plate (30) laterally projecting from said terminal block body (2) to said sheet metal plate.

5. A terminal block construction according to one or more of the preceding claims, characterized in that said terminal block body (2) is provided, on the side thereof opposite to said electric contacts (10), with a seat (40) for removably housing therein the plug contacts for connecting said household apparatus to the mains.

Patentansprüche

1. Integrierte Anschlußblockkonstruktion (1), die fest mit einem elektrischen Stecker verbunden ist, insbesondere zum Verbinden einer Blechplatte eines Elektrohaushaltsgeräts, umfassend einen Anschlußblockkörper (2), der mit einem elektrischen Stecker verbunden ist, wobei der Anschlußblockkörper (2) auch Einrastmittel umfaßt, um den Körper mit der Blechplatte zu verbinden, mit der ein Erdplattenkontakt (30) der Anschlußblockkonstruktion verbunden werden kann, **dadurch gekennzeichnet, daß** die Anschlußblockkonstruktion (1) weiterhin eine Vielzahl von elektrischen Kontakten (10) umfaßt, die in parallelen Reihen ausgerichtet sind, wobei jeder Kontakt eine im wesentlichen U-förmige Konfiguration mit zwei parallelen Armen (11) von klingenartiger Gestalt aufweist, wobei die Arme (11) in Paaren durch ein Brückenelement (12) verbunden sind, in dem ein Zwischenbereich (12a) vorgesehen ist, wobei in dem Bereich ein Schlitz vorgesehen ist, wobei der Schlitz zwei Seiten bildet, die auseinandergespreizt werden können, um einen Durchlaß für die jeweiligen Leiter (3a) des elektrischen Kabels (3) zu schaffen, wobei der Zwischenbereich (12a) mechanisch verformt werden kann, um die Leiter (3a) dort festzulegen, wobei die Kontakte in den Reihen für jeden Pol durch elektrisch isolierende Kunststoffwände (45) getrennt sind.

2. Anschlußblockkonstruktion nach Anschluß 1, **dadurch gekennzeichnet, daß** das Kabel (3) mit dem Anschlußblockkörper (2) mittels Ansätzen (4) verbunden ist, die so gestaltet sind, daß sie ein Lösen des Kabels verhindern können.

3. Anschlußblockkonstruktion nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, daß** die Einrastmittel mit einer ausgeschnittenen Aufnahme (25) versehen sind, die in einer überbrückenden Beziehung an einem Randbereich einer Fensterausbildung (20) angeordnet werden kann, die in der Blechplatte des Elektrohaushaltsgeräts ausgebildet ist, wobei an der Seite gegenüber der ausgeschnittenen Aufnahme (20) außerdem ein nachgiebiges Zahnelement (27) vorgesehen ist, das in anliegende Berührung mit der Blechplatte kommen kann, wobei das Zahnelement (27) mit einem Vorsprung (28) versehen ist, der durch ein Werkzeug erfaßt werden kann, um den Anschlußblockkörper (2) von der Blechplatte zu lösen.

4. Anschlußblockkonstruktion nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, daß** in der Nähe der Fensterausbildung (20) mindestens ein Loch (31) ausgebildet ist, um die Erdkontaktplatte (30), die seitlich von dem Anschlußblockkörper (2) vorsteht, mit der Blechplatte zu verbinden.

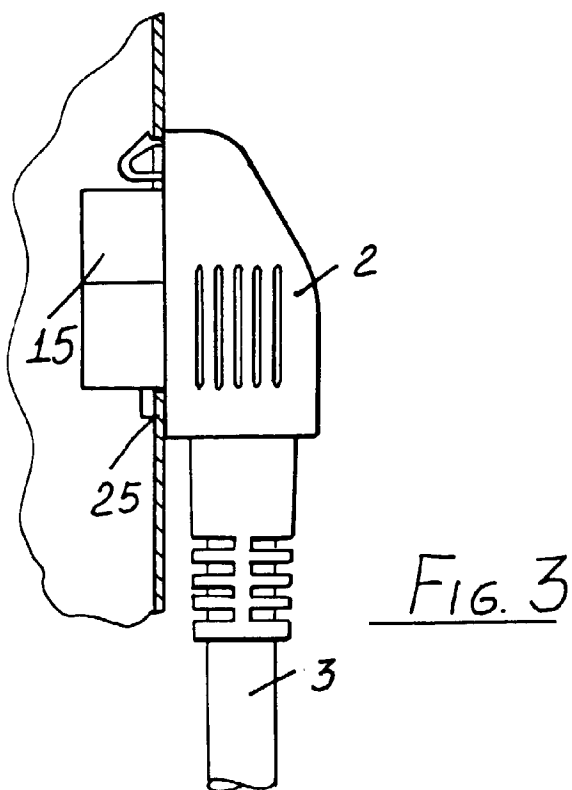
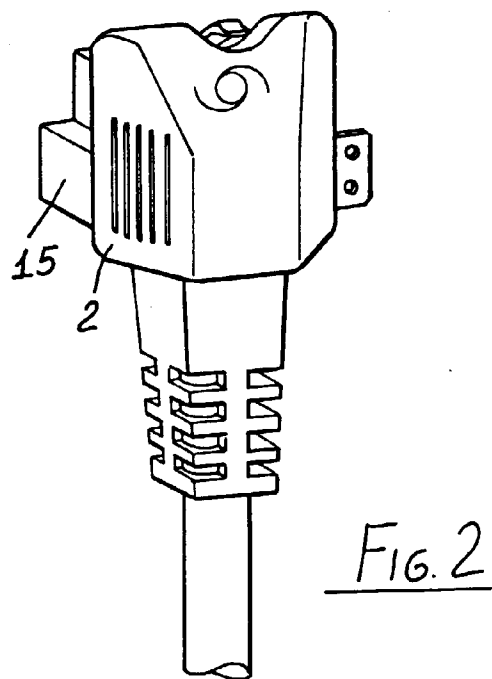
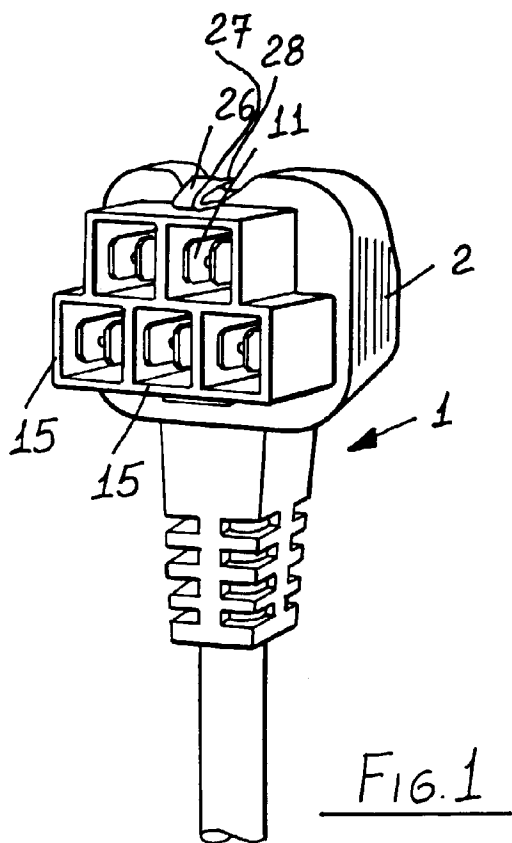
5. Anschlußblockkonstruktion nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, daß** der Anschlußblockkörper (2) an der Seite gegenüber den elektrischen Kontakten (10) mit einer Aufnahme (40) versehen ist, um darin die Steckerkontakte zur Verbindung des Haushaltsgeräts mit dem Stromnetz entfernenbar aufzunehmen.

Revendications

1. Construction de bloc de raccordement intégré (1), connecté rigidement à une fiche électrique, notamment destiné à assurer un couplage à une plaque de métal d'un appareil électroménager, comprenant un corps de bloc de raccordement (2) couplé à un câble électrique (3) associé avec une fiche électrique, ledit corps de bloc de raccordement (2) comprenant également des moyens de verrouillage destinés à coupler ledit corps à ladite plaque de métal avec laquelle peut être associé un contact à plaque formant masse (30) de ladite construction de bloc de raccordement, caractérisée en ce que ladite construction d'un bloc de raccordement (1) comprend en outre un ensemble de contacts électriques (10) alignés en rangées parallèles, chacun desdits

contacts ayant une configuration sensiblement en forme de U avec deux bras (11) parallèles ayant une forme analogue à une lame, lesdits bras (11) étant connectés par paires par un élément formant pontage (12), dans lequel est constitué une partie intermédiaire (12a) partie dans laquelle est ménagée une fente ; ladite fente définissant deux côtés pouvant être écartés de façon à y créer un passage pour des conducteurs (3a) respectifs dudit câble électrique (3), ladite partie intermédiaire (12a) étant capable d'être mécaniquement déformée afin d'y verrouiller lesdits conducteurs (3a) ; lesdits contacts étant séparés, dans lesdites rangées, pour chaque pôle, par des parois (15) en plastique isolant électrique.

2. Construction de bloc de raccordement selon la revendication 1, caractérisée en ce que ledit câble (3) est couplé audit corps de bloc de raccordement (2) au moyen de pattes (4) ayant une forme pouvant empêcher tout débranchement dudit câble.
3. Construction de bloc de raccordement selon l'une quelconque des revendications précédentes, caractérisée en ce que lesdits moyens de verrouillage sont pourvus d'une assise (25) découpée pouvant être agencée par pontage sur une partie de rebord d'un agencement formant fenêtre (20) formé dans ladite plaque de métal dudit appareil électoménager ; sur le côté de ces moyens opposé à ladite assise découpée (20) est prévu de plus un élément élastique formant dent (27) pouvant entrer en appui contre ladite plaque de métal ; ledit élément formant dent (27) étant pourvu d'un prolongement (28) pouvant entrer en prise avec un outil destiné à désengager ledit corps de bloc de raccordement (2) à partir de ladite plaque de métal.
4. Construction de bloc de raccordement selon l'une quelconque des revendications précédentes, caractérisée en ce qu'à proximité dudit agencement formant fenêtre (20), est formé au moins un trou (31), destiné à assurer le couplage de ladite plaque de contact formant masse (30) faisant saillie latéralement à partir dudit corps de bloc de raccordement (2) à ladite plaque de métal.
5. Construction de bloc de raccordement selon l'une quelconque des revendications précédentes, caractérisée en ce que ledit corps de bloc de raccordement (2) est muni, sur son côté opposé auxdits contacts électriques (10), d'une assise (40) pour y loger de manière amovible les contacts de fiche destinés à connecter ledit appareil ménager au réseau électrique.



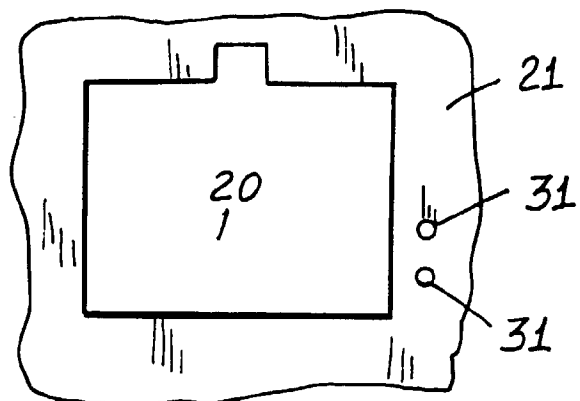


FIG. 4

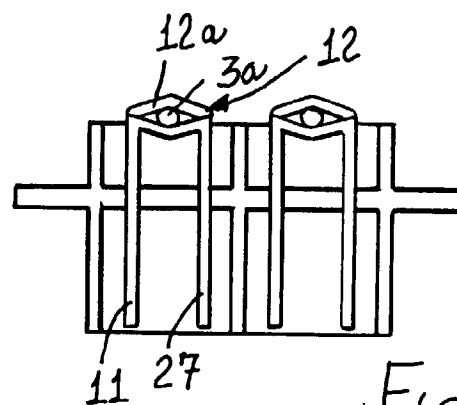


FIG. 5

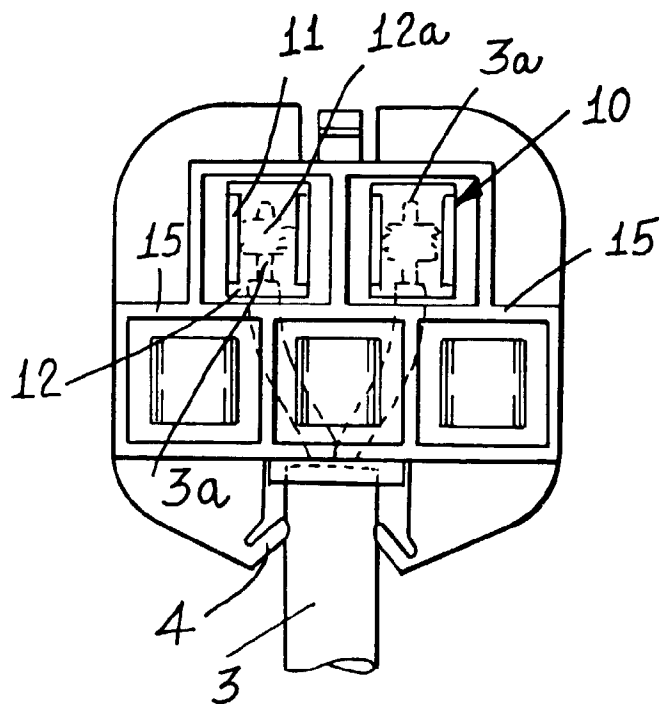


FIG. 7

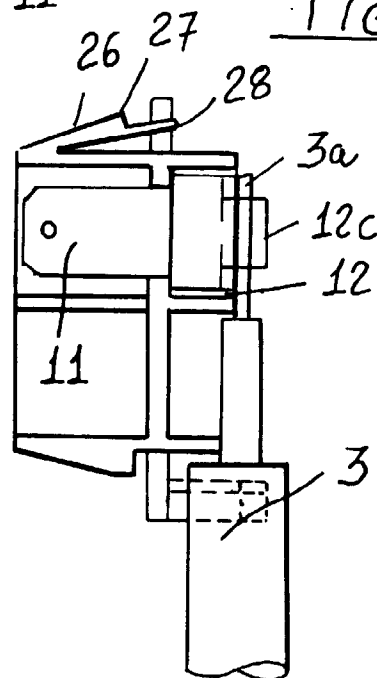


FIG. 6

