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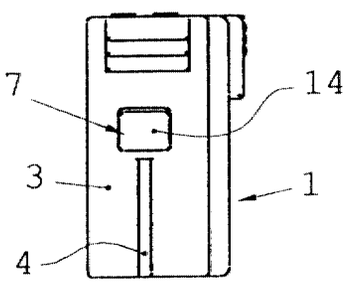
(54) Improved blocking element for electrical connectors

(57) Improved blocking element for electrical connectors made up of an extended body which has two opposite ends (8, 9), said blocking element (7) being adapted to be housed, by sliding, in the body (3) of an electrical connector (1), said blocking element (7) being intended to hold in place the electrical terminals inserted in the connector (1).

FIG.1



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Description

[0001] An improved blocking element for electrical connectors.

[0002] The present Utility Model application consists, as its title indicates, of an "Improved blocking element for electrical connectors", whose new characteristics of construction, shape and design fulfil the object for which it has specifically been planned, with maximum safety and effectiveness.

[0003] As is known in the state of the art, electrical connectors are intended to serve as a junction point for a set of terminals joined to the ends of the corresponding electrical cables in order to establish contact between the different parts of the electrical system of, for example, a car.

[0004] The coupling of terminals inside the connectors is carried out manually or automatically, by introducing the terminals through one of the lower bases of the connector until they are completely inserted inside in a specific cavity of the connector adapted to house said terminals.

[0005] The fitting of the cables in each cavity of the connectors is a laborious operation because there are usually a large number of electric cables in the connectors. In these cabling operations, the insertion of the terminals inside the connector must be carried out correctly, that is, without connection errors. In other words, it is important not only that, in a cabling operation, the terminals enter the connector completely, but also that they remain in their working position without the possibility that the terminals might come out of their proper housing area due, in general, to the traction force exerted by the bundle of cables entering the connector.

[0006] In this sense, there are blocking means for the terminals designed to be introduced into the body of the connector in order to hold said terminals in place once the blocking element has been completely inserted in the connector.

[0007] Although this type of holding means is an effective solution to ensure connection of the terminals arranged in the respective connectors, the fitting of a large number of connectors provided with these blocking means involves an uncomfortable task for the operator. In effect, the operator must insert the blocking element carefully so that the sliding of the same in the connector is carried out correctly, paying special attention to ensure that said sliding takes place continuously and thus being able to detect any connection fault in the terminals.

[0008] The present invention has been developed to exploit the remarkable advantages offered by this type of blocking elements, but configuring them with a new conception to facilitate fitting, especially in the case of a large number of units to be fitted.

[0009] Basically, the improved blocking element for electrical connectors that is the object of the present invention has a configuration that is made up of an extended body with two opposite ends. Said blocking element is conveniently designed to be housed, by sliding, inside the body of an electrical connector of the type used, for example, in the electrical installations of cars. Once completely coupled inside the connector, this blocking element serves to hold cables and terminals in place, thus ensuring a safe and effective connection. Therefore, the blocking element is provided with a number of projections which, in blocked position, are arranged so as to coincide with cavities in the connector for the passage of the cables with their corresponding terminals, thus holding them in place.

[0010] The peculiarity of the blocking element of the invention is that both opposite ends of said blocking element fit tightly with respect to the connector body, while the central part of the blocking element has a certain play to facilitate coupling of the same inside the connector. More specifically, the blocking element of the invention is provided with an end which has a stepped area. Said stepped area has a shape that is complementary to the shape of the end of the aperture of the connector body where the blocking element is coupled. Both ends of the blocking element and of the connector have substantially similar dimensions in order to provide a tight fit. Moreover, the opposite end of the blocking element of the invention is also provided with an area that fits tightly with the connector body. Said opposite end also incorporates an operating surface perpendicular to the blocking element, adapted so that the user moves the blocking element to a blocked position to cause the terminals to be held in place, or releases it from said position to an unblocked position to allow the cables to be inserted in the connector.

[0011] With a blocking element such as that described, insertion can be achieved with great speed, mainly due to the substantial play in most of the travelling distance of the same, which allows it to be guided into the connector, since the contact surface between the parts is reduced and thus the operator will find it much easier to guide it.

[0012] The good fit provided by the ends of the blocking element ensures the adequate holding of the same, which positively influences the reduction of connection errors when the terminals are placed in the cavities of the connector, since they can only enter in one position. Therefore, withdrawn positions of the terminals are eliminated and their immobilisation is ensured in a much easier way than with conventional blocking elements.

[0013] Other features of the present invention will be clear from the following description of a preferred embodiment of a blocking element in accordance with the present invention. This description will be given, from here on, by way non-restrictive example, with reference to the drawings which accompany it, in which:

Figure 1 is a side elevation view of an electrical connector.

Figure 2 is a side elevation view of a connector-

holding module.

Figure 3 is a cross-sectioned front elevation view of an electrical connector provided with a blocking element in accordance with the present invention.

Figure 4 is a front elevation view of the connector-holding module of figure 2.

Figure 5 is a plan view of the connector mounted in the connector-holding module.

Figure 6 is a perspective view illustrating the electrical connector separated from the connector-holding module, said electrical connector being provided with the blocking element of the invention mounted in the blocked position.

[0014] The elements appearing in the attached drawings are the following: (1) electrical connector, (2) connector-holding module, (3) body of the connector, (4) cavities of the electrical connector, (5) outer grooves of the body of the electrical connector, (6) inner projections of the connector-holding module, (7) blocking element, (8) end of the blocking element, (9) end of the blocking element, (10) central area of the blocking element, (11) end of the cavity of the connector body for the blocking element, (13) notch of the end of the blocking element, and (14) operating surface of the blocking element.

[0015] In the drawings one may observe an electrical connector (1) and a connector-holding module (2). The connector comprises a body (3) provided with a plurality of prismatic cavities (4) for housing electrical terminals fixed to the corresponding cables. The body (3) of the connector (1) includes outer grooves (5) adapted to be coupled with corresponding inner projections (6) of the connector-holding module (2).

[0016] The connector (1) is provided with a blocking element (7) which serves to hold in place the terminals (not shown) inside the body (3) of the connector (1) when it is completely inserted inside the connector (1), as shown in figure 3, thus providing a safe and effective connection.

[0017] The blocking element (7) in the embodiment of the drawings has a configuration that is made up of an extended body with two opposite ends (8, 9) and a central area (10) as shown in said figure 3.

[0018] The two ends (8, 9) fit tightly with respect to the respective ends (11, 12) of the cavity of the body (3) of the connector (1). On the other hand, the central part (10) of the blocking element (7) has a certain play which serves to facilitate its sliding inside the body (3) of the connector (1). The fitting provided by the ends (8, 9) of the blocking element (7) ensures the correct fixing of the same and, therefore, the holding in place of the terminals in the connector.

[0019] In this sense and, as may be observed in figure 3, the end (8) of the blocking element (7) has a stepped area defined by a notch (13) coupled tightly in the connector when the blocking element (7) reaches its final position, that is, when it reaches the blocked position shown in figure 3. As may be observed, the stepped area has a shape that is complementary to the shape of the end (11) of the aperture of the body (3) of the connector (1), both ends having substantially similar shapes and dimensions so as to provide said tight fit.

[0020] The opposite end (9) of the blocking element (7) of the present invention also has an area that fits tightly with the body (3) of the connector (1). In addition, said end (9) incorporates an operating surface (14), as illustrated in figures 1, 3 and 6 of the drawings. The operating surface (14) is arranged perpendicularly with respect to the blocking element (7) and serves to allow the user to move the blocking element (7) to the blocked position shown in figure 3, thus causing the terminals to be held in place.

[0021] The materials, shapes, dimensions and other accessory elements which make up a blocking element in accordance with the present invention may conveniently be replaced by others which are technically equivalent, provided that they do not depart from the essential nature of the present invention, nor from the inventive concept of the same, as defined in the claims included below.

Claims

1. An improved blocking element for electrical connectors made up of an extended body which has two opposite ends (8, 9), said blocking element (7) being adapted to be housed, by sliding, in the body (3) of an electrical connector (1), said blocking element (7) being intended to hold in place the electrical terminals inserted in the connector (1), **characterised in that** both opposite ends (8, 9) of said blocking element (7) fit tightly with the body (3) of the connector (1), while the central part (10) of the blocking element (7) has a certain play to facilitate sliding of the same inside the body (3) of the connector (1).

2. An improved blocking element for electrical connectors in accordance with claim 1, **characterised in that** it has an end (8) provided with a stepped area which has a shape that is complementary to the shape of the end (11) of the aperture of the body (3) of the connector (1), where the blocking element (7) is coupled; said end (8) of the blocking element (7) and the end (11) of said aperture have substantially similar dimensions so as to provide a tight fit; the blocking element (7) also has an opposite end (9) provided with an area that fits tightly with the body (3) of the connector (1) and provided with an operating surface (14), perpendicular to the blocking element (7), adapted so that the user can move said blocking element (7) to a blocked position in order to hold the terminals in place, or release it from said position to an unblocked position to allow the cables to be inserted into the connector (1).

FIG.1

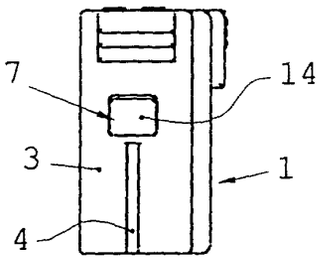

FIG.2

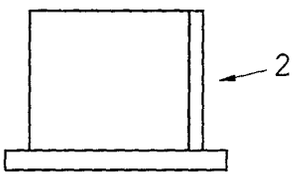

FIG.3

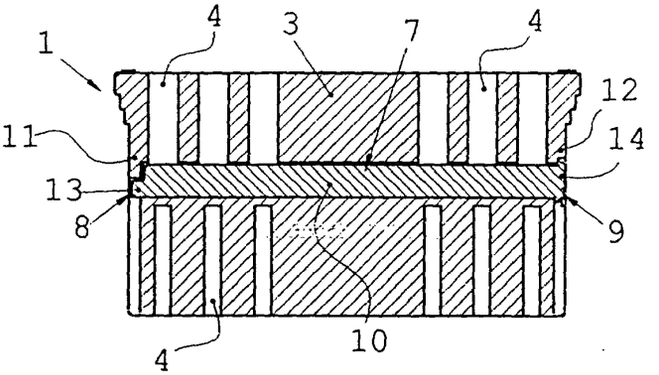

FIG.4

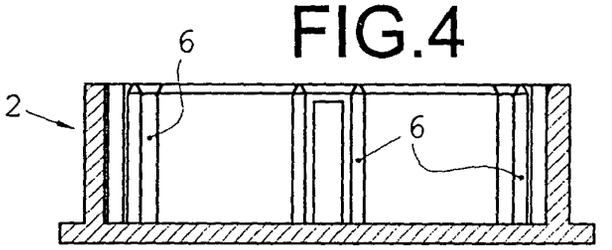

FIG.5

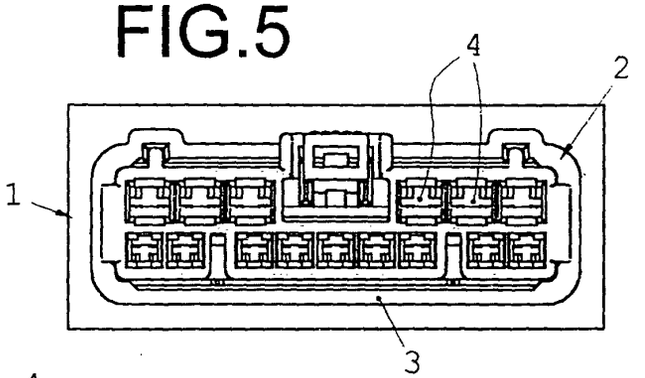

FIG.6