



## Description

**[0001]** As its title indicates, the present application consists of a "High-density multi-section electrical path connector", whose new characteristics of construction, shape and design fulfil the object for which it has specifically been planned, with maximum safety and effectiveness.

**[0002]** More specifically, the invention proposes an electrical connector for centralising cables in electrical installations of vehicles, of the type comprising a housing adapted to house terminals associated with corresponding cables. Inside this type of connectors cavities are provided which serve to house the cables and said terminals.

**[0003]** In practice, it has been found that there is a need to be able to control the position of the cabling during the mounting operation, above all when it is a question of a large number of cables in the same connector, which exert great traction and torsion forces that often cause the cables to come out of their position.

**[0004]** In this sense, the main objective of the present invention is to obtain an electrical connector of the type described which can house a great many cables, that is, provided with a large number of paths.

**[0005]** Another object of the present invention is to provide an electrical connector which is conveniently provided with means to block this large number of cables in an effective and constructively simple way.

**[0006]** Yet another object of the invention is to provide an electrical connector for electrical installations of vehicles that allows cables of different diameters to be housed inside it.

**[0007]** In general terms, a high-density multi-section electrical path connector in accordance with the present invention comprises a body provided inside with a plurality of cavities for housing electrical terminals for connecting the corresponding cables. This connector includes a blocking element adapted to hold said cables in position and has the peculiarity that it comprises a base surface provided with cavities for the passage of the cables arranged in the electrical connector. Moreover, said base surface of the blocking element extends in legs which are provided with respective wedge-shaped projections. These wedge-shaped projections are conveniently adapted to couple in complementary cavities made in the electrical connector. In this way, in a first coupling position of said blocking element, the latter is partially introduced, blocked in said cavities of the connector and, in a second coupling position it is completely introduced in said cavities and holds the cables in position.

**[0008]** The blocking element in accordance with the present invention is provided pre-assembled in the electrical connector and the terminals are then cabled in the same. When the cabling operation is finished, the blocking element is introduced completely into said complementary cavities of the connector, holding all the

fitted cables in position. It should be especially noted that the surface of the blocking element has two groups of cavities to prevent it from being introduced if the cables are not correctly placed in the connector. More specifically, the surface of the blocking element where the operator exerts pressure to couple it in the connector, comprises a first group of cavities with a substantially rectangular shape, in whose inner profile there are a series of circular incuts of different diameters for holding in position a large number of electrical cables of different diameter. Said surface of the blocking element has also a second group of cavities made up of semi-circular incuts made in the outer part of the surface of the blocking element.

**[0009]** Once the blocking element is completely coupled, the terminals and the cables are held in place, thus preventing them from leaving their position in the electrical connector.

**[0010]** With a high density multi-section electrical path connector such as that described, the intended objects are achieved and other advantages are also provided, which will become clearer in the detailed description of a preferred embodiment given, from here on, by way of non-restrictive example, with reference to the drawings which accompany it, in which:

**[0011]** Figure 1 is an exploded view of an embodiment of a high-density multi-section electrical path connector in accordance with the present invention.

**[0012]** Figure 2 is a plan view from above of the connector shown in figure 1.

**[0013]** Figure 3 is a side elevation view of the connector of the invention, sectioned through the plane A-A' of figure 4.

**[0014]** Figure 4 is a front elevation view of the connector of the invention.

**[0015]** And Figure 5 is a front elevation view of the connector of the invention, sectioned through the plane B-B' of figure 3, in which the blocking element is pre-assembled in the electrical connector.

**[0016]** In the drawings the following elements may be observed: (1) housing of the electrical connector, (2) cavities of the electrical connector, (3) cavities of the electrical connector, (4) blocking element, (5) surface of the blocking element, (6) rectangular cavities of the surface of the blocking element, (7) semi-circular cavities of the surface of the blocking element, (8, 9) legs, (10) projection of the legs, (11) complementary cavities of the connector, (12) projections of the complementary cavities of the connector, and (13) guiding element of the cables in the connector.

**[0017]** In the drawings, an embodiment is illustrated of an electrical connector for organising and centralising the cables in the electrical installation of a car. This connector comprises a housing (1) provided inside with a series of cavities (2, 3) of different size, adapted to house electrical terminals (not shown) associated with electrical cables of different diameters (also not shown in the drawings for reasons of clarity). The connector

illustrated is adapted to adequately house a large number of cables. More specifically, the connector represented in figures 1 to 5 is a 30-path connector.

**[0018]** The connector is provided with a blocking element (4) designed to hold in position the cables which enter the connector. The blocking element (4) is made up of a surface (5) which contains two groups of cavities (6, 7) for the passage of said cables arranged in the electrical connector.

**[0019]** The surface (5) of the blocking element extends perpendicularly in legs (8, 9), each of which is provided with a wedge-shaped projection (10) adapted to be coupled in complementary cavities (11) made in the electrical connector. The cavities (11) of the connector have a complementary inner projection (12) whose purpose is to make it difficult to extract the blocking element (4) since the respective projections (10) of the legs (8, 9) of said blocking element (4) act as a check. In this sense, a first coupling position, or pre-assembly position of the blocking element (4) is established, in which the latter is partially introduced, blocked, into said cavities (11) of the connector. A second coupling position is established in which the blocking element is completely introduced into the cavities (11), holding the cables in position thanks to the pressure exerted by the profiles of the cavities (6, 7) made in the surface (5) of the blocking element (4).

**[0020]** In this sense, the blocking element (4) is arranged pre-assembled in the electrical connector, that is, in the position illustrated in figure 5, and the terminals are then cabled. Subsequently, the blocking element (4) is completely introduced into the complementary cavities (11) of the connector, holding all the fitted cables in position, which are conveniently guided by the guide element (13) of the connector.

**[0021]** With particular reference to figures 1 and 2 of the drawings, the cavities (6, 7) made in the surface (5) of the blocking element (4) consist of a first group of cavities (5) with a substantially rectangular shape, and with a series of circular incuts of different diameters in their inner profile, which are adapted to hold in position a large number of electrical cables of different diameters; and a second group of cavities (6) made up of semi-circular incuts made in the outer part of the surface of the blocking element.

**[0022]** Although the drawings represent an embodiment of a multi-section 30-path electrical connector made up of a body with a plurality of cavities for housing terminals which includes a blocking element for holding the cables in position that consists of a surface which extends in legs provided with wedge-shaped projections to allow said blocking element to be pre-assembled, it is clear that, without departing from the essential nature of the present invention, nor from the inventive concept of the same, as defined in the claims included below, the materials of the elements which comprise said high-density multi-section electrical path connector may conveniently be modified, as may the shapes, dimensions

and other accessory elements, provided that they are technically equivalent.

## 5 Claims

1. A high-density multi-section electrical path connector comprising a body or housing (1) provided with a number of cavities (2, 3) for housing terminals for connecting corresponding electrical cables, and a blocking element (4) adapted to hold said cables in position, which has a base surface (5), **characterised in that** said base element (5) of the blocking element (4) is provided with cavities (6, 7) for the passage of the cables arranged in the electrical connector; said base (5) extends in legs (8, 9) provided with respective wedge-shaped projections (10) adapted to be coupled in complementary cavities (11) made in the connector in such a way that in a first coupling position of said blocking element (4), the latter is partially introduced, blocked, in said cavities (11) of the connector and, in a second coupling position, said blocking element (4) is completely introduced into the cavities (11), holding the cables in position.
2. A high-density multi-section electrical path connector in accordance with claim 1, **characterised in that** the surface (5) of the blocking element (4) has a first group of cavities (6) with a substantially rectangular shape, in whose inner profile there are circular incuts of different diameters for holding in position a large number of electrical cables of different diameters.
3. A high-density multi-section electrical path connector in accordance with claim 2, **characterised in that** the surface (5) of the blocking element (4) has a second group of cavities (7) made up of semi-circular incuts made in the outer part of the surface of the blocking element (4).

