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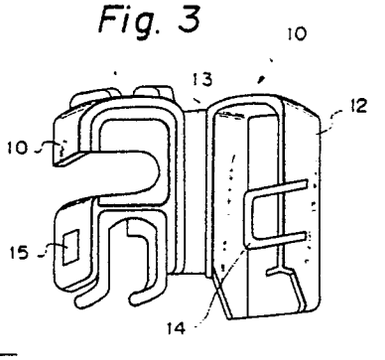
(54) Simplified waterproof electrical connector.

(57) An electrical connector (1a) mechanically connects electrical terminals housed in male and female connector bodies by mating and locking together these connector bodies. A simplified waterproof electrical connector is obtained by integrally forming a watertight cover (12) integrally with the double-locking portions of those connector bodies in such a manner as to be opened and closed at will.

Fig. 3



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SIMPLIFIED WATERPROOF ELECTRICAL CONNECTOR

The present invention relates to an electrical connector for use in a wire harness for automotive vehicles, and more particularly to an electrical connector with a simplified waterproofing function.

In conventional electrical connectors, a male connector body and a female connector body are mated and locked together to effect mechanical connection of electrical terminals housed in the respective connector bodies. It is conventional practice to use a fully sealed waterproof connector in a location where entry of water from the outside is possible when a connector of this type is used in a wire harness for automotive vehicles. In contrast, in a location where such complete waterproofing is considered to be excessively cautious, as shown in Fig. 4, grease is injected into the interior of a non-waterproof type connector 1, and then a watertight cover 2 made from PVC or the like (shown in Fig. 5) is mounted on the connector 1 from the rearward portion thereof. Subsequently, insulating tapes 3 are wound around the connected portion of the watertight cover 2. In this situation, the watertight cover 2 and the insulating tapes 3 serve to guard not only against entry of water from the outside but also against leakage of grease from the cover 2.

Simplified waterproofing of the type described above, however, involves a need for additional working processes, and hence reduces the assembly efficiency in wire harness production. In addition, the efficiency with which wire harnesses can be mounted on automotive vehicles is also remarkably reduced.

The above-mentioned problems which are inherent in the conventional simplified waterproofing is to be solved by the present invention the object of which is to provide a simplified waterproof electrical connector that can eliminate a need for additional working processes, improve the working efficiency in the processes to follow, and attains complete waterproofing.

More particularly, to solve the above-mentioned problems, the present invention provides a simplified waterproof electrical connector comprising a male connector body and a female connector body which are mated and locked together to effect mechanical connection of electrical terminals housed in the respective connector bodies wherein a watertight cover is formed integrally to the double-locking portions of the connector bodies in such a manner as to be opened and closed at will.

With the simplified waterproof electrical connector according to the present invention configured as described above, simplified waterproofing is completed by closing and locking the watertight cover, and the following assembly work is made easy due to there being no additional component to be attached. The cover can also be utilized for the orientation of electric wires.

Many other advantages, features and additional objects of the present invention will become apparent to those skilled in the art upon making reference to the detailed description and the accompanying drawings on which preferred structural embodiments incorporating the principles of the present invention are shown only by way of illustration.

Fig. 1 is a perspective view of a simplified waterproof electrical connector according to the present invention,

Fig. 2 is an exploded perspective view of the connector shown in Fig. 1,

Fig. 3 is a front perspective view of the male connector body shown in Fig. 2.

Fig. 4 is a perspective view of a simplified electrical connector on which conventional simplified waterproofing is effected, and

Fig. 5 is a perspective view of a watertight cover used in the conventional connector shown in Fig. 4.

One preferred embodiment of a simplified waterproof electrical connector according to the present invention will be explained with respect to Figs. 1 to 3. A connector 1a used in the present inventions is a connector that is transformed to a waterproof type from a non-waterproof type which is its original type. In this connector 1a, a double-locking retainer 10 and a connector body 20 are mated and locked together to effect mechanical connection of electrical terminals housed (not shown) in the retainer 10 and the connector body 20.

As shown in Figs. 2 and 3, a double-locking portion 11 and a watertight cover 12 that can be opened and closed at will are integrally formed with the double-locking retainer 10. The watertight cover 12 is connected to the double locking retainer 10 in such a manner as to be opened and closed at will via a hinge portion 13. A hanger 14 provided on the cover 12 is adapted to be associated with a projection 15 provided on the retainer 10 so that the cover 12 is locked and retained in place.

The double locking portions serve to push electrical terminals in the male and female connector bodies so as to place them at their normal positions if the terminals are not completely inserted. These double-locking portions also serve to strengthen the retained state of not only the con-

nector bodies but also the electrical terminals.

With the present invention, simplified waterproofing for a connector is attained by introducing slight improvements on a conventional non-waterproof type connector, and the so produced connectors are able to be easily mounted on automotive vehicles in the working process to follow.

The present invention, therefore, is well adapted to carry out the objects and attain the ends and advantages mentioned as well as others inherent therein. While the presently preferred embodiment of the present invention is given for the purpose of disclosure, numerous changes in the details of construction and arrangement of parts may be made which will readily suggest themselves to those skilled in the art and which are encompassed within the spirit of the invention and scope of the appended claims.

Claims

1. A simplified waterproof electrical connector comprising a male connector body and a female connector body which are mated and locked together to effect mechanical connection of electrical terminals housed in the respective connector bodies wherein a watertight cover is integrally formed with the double-locking portions of said connector bodies in such a manner as to be opened and closed at will.

Fig. 1

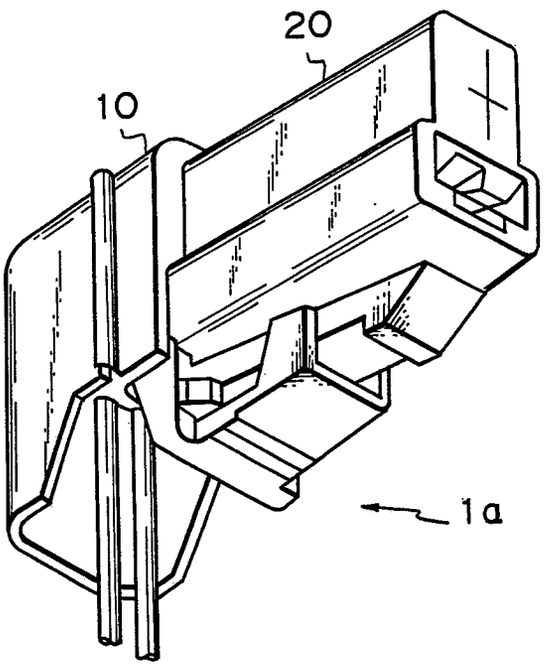

Fig. 2

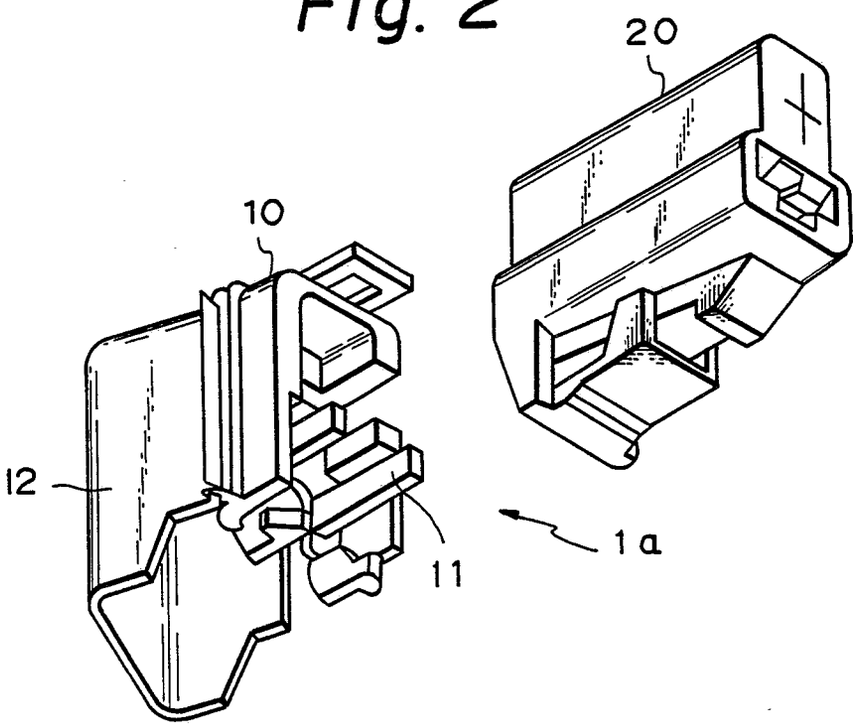

Fig. 3

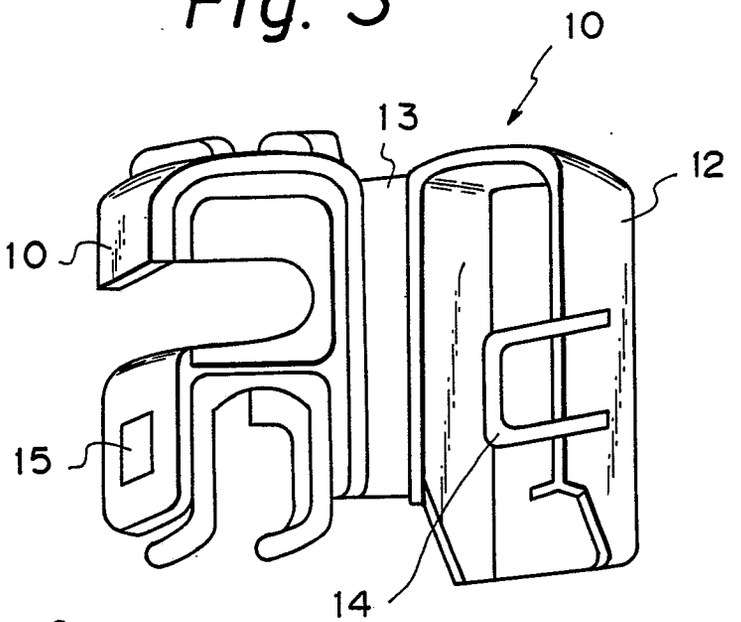

Fig. 4

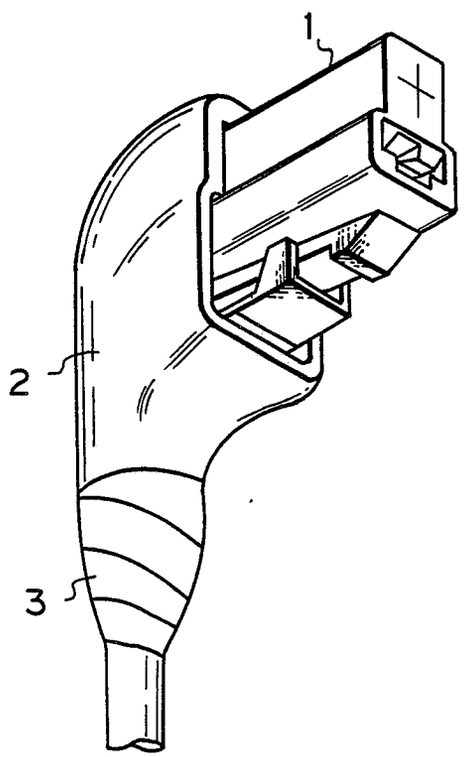

Fig. 5