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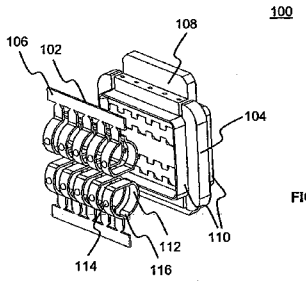


FIG. 1

(57) Abstract: An elastomeric interface connector (100) having an elastomeric casing (104) and an electrically conductive member (102) adapted to be inserted into the elastomeric casing (104). The elastomeric casing (104) comprises at least one engaging member (108) and an integrated mold in gasket (110). The electrically conductive member (102) comprises a plurality of electrically conductive leaf spring contacts (112) and at least one tie bar member (106).

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ELASTOMERIC INTERFACE CONNECTOR

FIELD OF INVENTION

The present invention relates to an elastomeric interface connector.

BACKGROUND ART

The demand of integrated devices, specifically communication-sensor modules, with hassle-free installation and maintenance is on the rise. In the current designs of sensors, multiple sensors are made available on a single board, but the said sensors are separated from corresponding communication modules for ease of maintenance. Most sensors are at present being used in open field applications, which means, the integrated devices are required to be water-tight or air-tight while maintaining electrical conductivity, in order to be operational in any condition outdoors.

Thus there is a need to provide for a mechanical interface connector assembly for use between two electronic integrated devices so as to establish quick connect engagement between the devices thereby providing a standalone feature that provides flexibility of detachment of one electronic integrated device from another.

SUMMARY OF INVENTION

In one embodiment of the present invention is an elastomeric interface connector having an elastomeric casing and an electrically conductive member adapted to be inserted into the elastomeric casing. The elastomeric casing comprises at least one engaging member and an integrated mold in gasket. The electrically conductive member comprises a plurality of electrically conductive leaf spring contacts and at least one tie bar member.

The present invention consists of features and a combination of parts hereinafter fully described and illustrated in the accompanying drawings, it being understood that various changes in the details may be made without departing from the scope of the invention or sacrificing any of the advantages of the present invention.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

To further clarify various aspects of some embodiments of the present invention, a more particular description of the invention will be rendered by references to specific embodiments thereof, which are illustrated, in the appended drawings. It is appreciated that these drawings depict only typical embodiments of the invention and are therefore not to be considered limiting of its scope. The invention will be described and explained with additional specificity and detail through the accompanying drawings in which:

FIG. 1 is an illustration of an elastomeric interface connector having an elastomeric casing and an electrically conductive member.

FIG. 2A is an illustration of the front view of an electrically conductive member being inserted into an elastomeric casing.

FIG. 2B is an illustration of the A-A cross section of FIG. 2A.

FIG. 3 is an illustration of the engagement of the elastomeric interface connector to a module.

FIG. 4A is an illustration of the assembly of a communication-sensor module comprising the elastomeric interface connector.

FIG. 4B is an illustration of the horizontal sectional view of FIG. 4A when a communication-sensor module is engaged.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention relates to an elastomeric interface connector. Hereinafter, this specification will describe the present invention according to the preferred embodiments of the present invention. However, it is to be understood that limiting the description to the preferred embodiments of the invention is merely to facilitate discussion of the present invention and it is envisioned that those skilled in the art may devise various modifications and equivalents without departing from the scope of the appended claims.

The present invention is applied in integrated devices to electronically connect two parts of a module assembly, such as communication-sensor modules, that are major components of a wireless sensor network transceiver. The integrated device is required to meet stringent water sealing specifications which requires a hermetic sealed design. As such, both parts of the module assembly are required to be hermetically sealed individually. To achieve this performance, the present invention is designed as a double-sided dual row elastomeric interface connector.

Reference is collectively being made to FIGs. 1, 2A, 2B and 3. FIG. 1 is an illustration of an elastomeric interface connector having an elastomeric casing and an electrically conductive member. FIG. 2A is an illustration of the front view of an electrically conductive member being inserted into an elastomeric casing. FIG. 2B is an illustration of the A-A cross section of FIG. 2A. FIG. 3 is an illustration of the engagement of the elastomeric interface connector to a module.

The elastomeric interface connector (100) of the present invention comprises an elastomeric casing (104) and an electrically conductive member (102) adapted to be inserted into the elastomeric casing (104). The elastomeric casing (104) comprises at least one engaging member (108) and an integrated mold in gasket (110). The electrically conductive member

(102) comprises a plurality of electrically conductive leaf spring contacts (112) and at least one tie bar member (106).

The engaging member (108) comprises a structure that protrudes from the elastomeric casing (104) in order to be engaged with a module (306), such as a communication module. The engaging member (108) is engaged to a connection slot (302) while maintaining the accurate position of the plurality of electrically conductive leaf spring contacts (112).

The plurality of electrically conductive leaf spring contacts (112) comprises at least one dimple (114) and a gap (116).

The dimple (114) CAN comprise of one or more dimples that are disposed opposite one another on each of the plurality of electrically conductive leaf spring contacts (112). The dimple (114) ensures electrical connectivity between each of the plurality of electrically conductive leaf spring contacts (112) and a plurality of contact surfaces (304) on the module (306).

The gap (116) in the plurality of electrically conductive leaf spring contacts (112) is filled with elastomeric material. This elastomeric material provides room for the compression of each of the plurality of electrically conductive leaf spring contacts (112) when the module (306) is engaged with a sensor module (402). The elastomeric material also provides a spring force for the extension of each of the plurality of electrically conductive leaf spring contacts (112) when the sensor module (402) is disengaged from the module (306). The elastomeric material may comprise of any form of natural or synthetic rubber, for instance, silicone rubber.

The plurality of electrically conductive leaf spring contacts (112) is insert-molded in elastomeric material to provide elasticity property when the module (306) is engaged to the sensor module (402).

The integrated mold in gasket (110) is compressed to provide hermetic sealing when the module (306) is engaged to the sensor module (402). The integrated mold in gasket (110) is structured as a surrounding metal contact that performs the function of a compression wedge or gasket. The integrated mold in gasket (110) shields the connection between the plurality of electrically conductive leaf spring contacts (112) and the contact surface (304) to provide an air-tight or water-tight configuration. Hence, the elastomeric casing (104) is able to provide air-tight or water-tight protection during assembly and is important to prevent liquid from bridging short circuits.

The at least one tie bar member (106) adjoins each of the plurality of electrically conductive leaf spring contacts (112). The plurality of electrically conductive leaf spring contacts (112) are adjoined by tie bar member (106) for ease of molding. The tie bar member (106) is then trimmed to break the connection between the plurality of electrically conductive leaf spring contacts (112).

Reference is being made to FIG. 4A. FIG. 4A is an illustration of the assembly of a communication-sensor module comprising the elastomeric interface connector. The elastomeric interface connector (100) is engaged to the module (306), the communication module. The assembly of the communication-sensor module is completed with a latch and lock engagement of the sensor module (402) to the communication module (306).

Reference is being made to FIG. 4B. FIG. 4B is an illustration of the horizontal sectional view of FIG. 4A when the communication-sensor module is engaged. The dimple (114) ensures electrical connectivity (406) between each of the plurality of electrically conductive leaf

spring contacts (112) and a plurality of contact surfaces (304). The gap (404) allows compression and spring force during engagement and disengagement of the module (306) and the sensor module (402). The integrated gasket (408) performs the function of a compression wedge or gasket during engagement.

CLAIMS

1. An elastomeric interface connector (100) having:

an elastomeric casing (104); and

an electrically conductive member (102) adapted to be inserted into the elastomeric casing (104);

characterized in that

the elastomeric casing (104) comprises

at least one engaging member (108); and

an integrated mold in gasket (110);

the electrically conductive member (102) comprises

a plurality of electrically conductive leaf spring contacts (112); and

at least one tie bar member (106).

2. The elastomeric interface connector (100) according to claim 1, wherein the at least one engaging member (108) protrudes from the elastomeric casing (104) to be engaged with a module (306).

3. The elastomeric interface connector (100) according to claim 1 and 2, wherein the integrated mold in gasket (110) is compressed to provide hermetic sealing when the module (306) is engaged with a sensor module (402).

4. The elastomeric interface connector (100) according to claim 1, wherein each of the plurality of electrically conductive leaf spring contacts (112) comprises

at least one dimple (114); and

a gap (116);

characterized in that

the at least one dimple ensures electrical connectivity between each of the plurality of electrically conductive leaf spring contacts (112) and a plurality of contact surfaces (304); and

the gap (116) is filled with elastomeric material to provide room for the compression of each of the plurality of electrically conductive leaf spring contacts (112) and spring force for the extension of each of the plurality of electrically conductive leaf spring contacts (112).

5. The elastomeric interface connector (100) according to claim 1, wherein the at least one tie bar member (106) adjoins each of the plurality of electrically conductive leaf spring contacts (112).

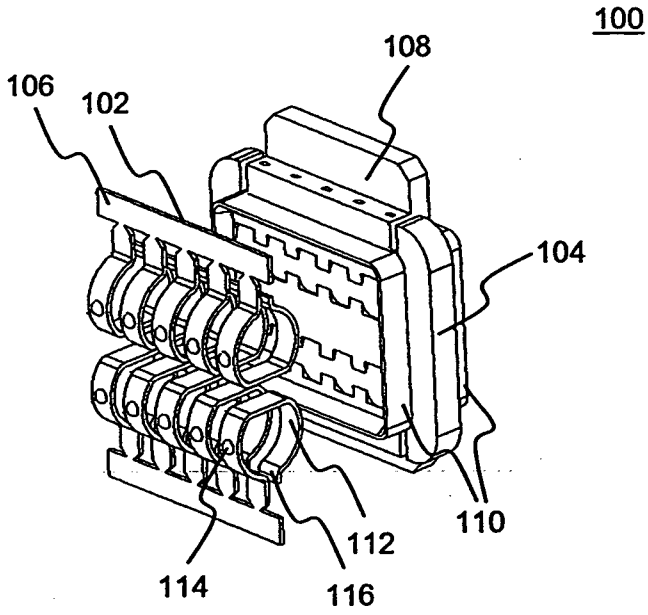


FIG. 1

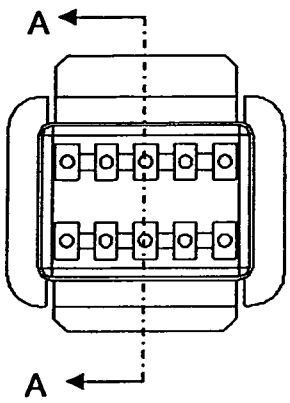


FIG. 2A

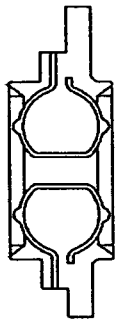


FIG. 2B

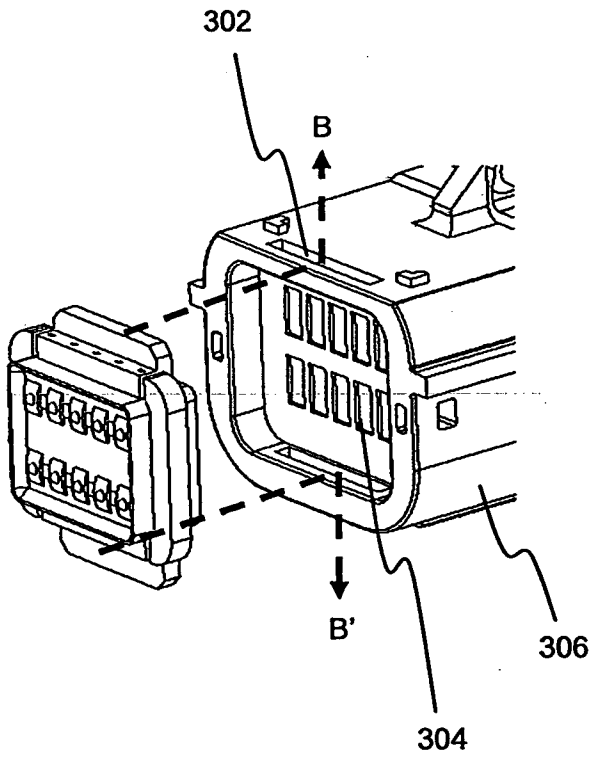


FIG. 3

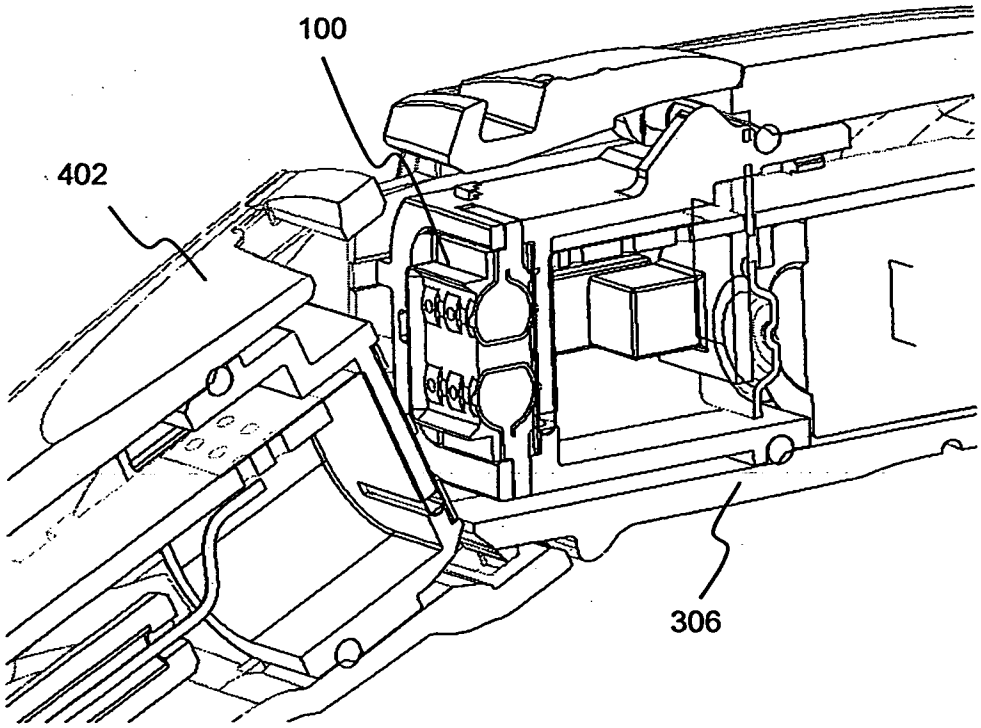


FIG. 4A

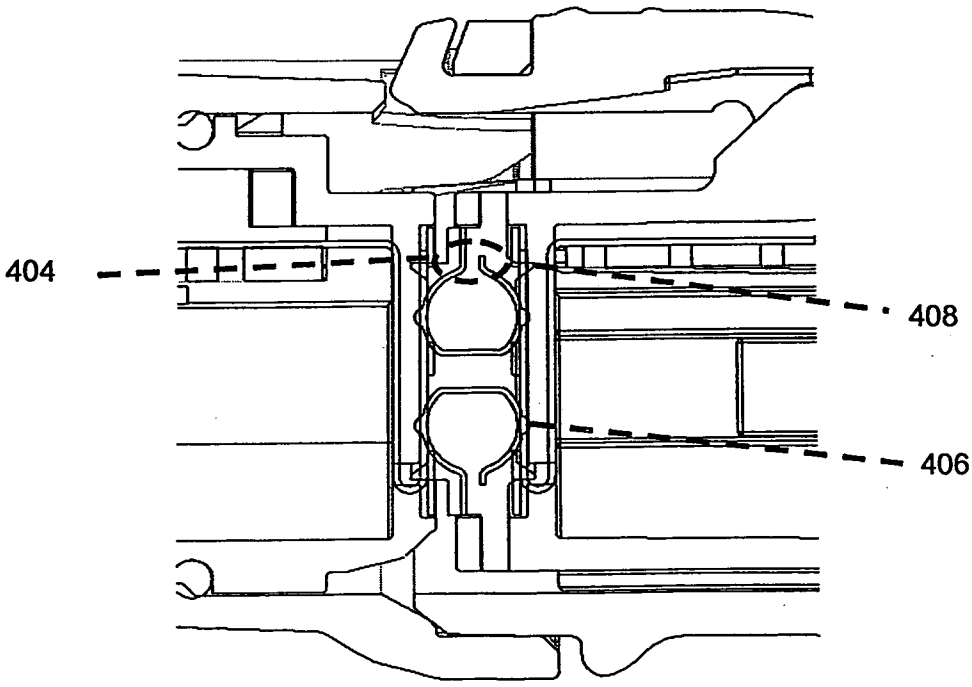


FIG. 4B