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ELECTRICAL CONNECTOR PROTECTOR

Filed June 15, 1964

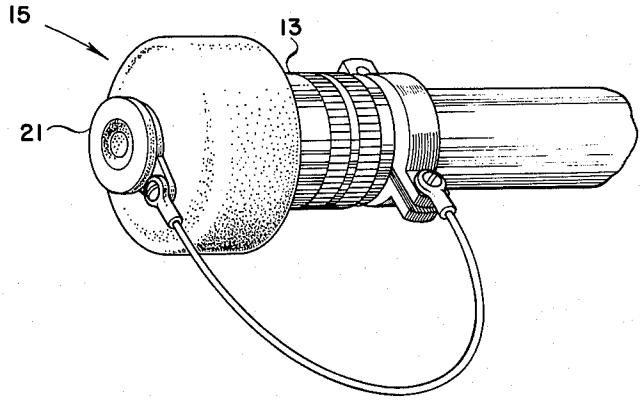


FIG. 1

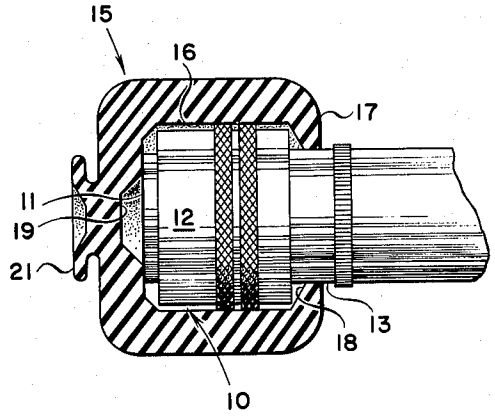


FIG. 2

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ELECTRICAL CONNECTOR PROTECTOR

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The present invention relates to a new and improved protector for electrical connectors.

Plug-in electrical connectors for cables have been used for years in industry and are presently widely used in the aerospace industry as a means for interconnecting electrical components which are located at different physical locations. Present-day electrical connectors for use in the areospace industry are extremely expensive items as they are often made with gold-plated connecting pins. Further, if there is any slight damage to the coupling rings, inserts, threads, or locking rings or pins of the connectors, then the entire connector must be replaced, which involves many man-hours of work to re-wire each connector.

It is the object of the present invention to provide an electrical connector protector with shock absorbing features which will protect electrical connectors from severe environmental conditions or breakage due to rough handling or accidental dropping. The device must also serve as a dust cover and have weather proof sealing characteristics and be readily insertable over any connector, be easy to use and inexpensive to make.

This and other objects and features and advantages of the present invention will become apparent upon perusal of the following specification and drawing of which

FIGURE 1 is a perspective view of an electrical connector-protector covering a connector, and

FIGURE 2 is a cross-sectional view of an electrical connector-protector shown covering a typical electrical connector in accordance with the present invention.

Referring now to the drawing, a typical multi-pin electrical connector **10** comprising a shell portion **11** which surrounds a plurality of connector pins (not shown) and is adapted to mate with a typical connector receptacle. Shell **11** is surrounded by ring member **12** which is adapted to mate with either the threaded portion or the bayonet pins of a receptacle, as the case may be, since both types are readily available on the commercial market and are in great use throughout industry. A strain relief **13** of the connector assembly **10** is threaded onto the back portion of shell assembly **11** to provide strain relief for the interconnect wires connected to the pins which are located therein.

The electrical connector-protector **15**, which is the subject of the present invention, in its preferred embodiment, comprises a one-piece, molded, flexible, resilient material, as of neoprene, for example, and is adapted to fit over connector assembly **10** as depicted in the drawing. The inner side wall surface **16** of connector-protector **15** has a diameter which is equal to or slightly greater than the outer diameter of ring **12** of connector **10**. The opened end of connector-protector **15** has an inwardly directed lip or shoulder portion **17** having an inner diameter slightly less than the diameter of the strain relief member **13** of the connector so as to snugly fit over strain relief member **13**. The inner surface **18** of lip portion **17** is a flat surface rising from the inner surface **16** of connector **15** at an obtuse angle with respect to the inner

side wall surface of approximately 120°. This provides the open end of the connector-protector **15** with additional rigidity needed to absorb shock to protect the connector from damage in case of rough handling or droppage. The connector **15** is provided with an inner base or bottom surface **19** which is slightly recessed or depressed in relation to the bottom surface of the protector. The depressed bottom surface portion **19** is provided to prevent damage from the connector pins in case the connector is accidentally dropped. A retaining ring or button **21**, not part of this invention, is provided on the external surface of the closed end of protector **15** to connect a linkage attachment to the connector-cable assembly if so desired.

When the connector-protector **15** is fitted over a connector as shown in FIGURE 2 the connector-protector will provide a shock absorbing cushion not available in any connector-protector presently available on the market or known to the inventors. If the connector **10** with a protective cover **15** is accidentally dropped on ring **21**, the depressed bottom surface **19** allows enough clearance so as to prevent the center portion of the bottom surface thereof from "bottoming" or touching against the connector pins. The angle that the lip **17** of the connector-protector **15** makes in relation to inner surface wall **16** should be such that a severe shock received by the connector-protector at or near its open end will not force the lip **17** to "mushroom" out, that is, to flex outwardly to a great extent. This feature, in addition to the thickness of the side wall portion, protects the ring member **12** from all but the most violent shock damage. In the preferred embodiment, lip **17** is tapered in thickness for ease of use. Further, the present connector-protector will provide a dust-proof cover and provide weather-resistant characteristics in addition to the shock absorbing features that will protect terminated connectors from severe environmental conditioning and from damage through rough or accidental mishandling.

It is noted that the electrical connector-protector shown in FIGURES 1 and 2 and described above is only exemplary, and that the inventive feature resides in the shock absorptive feature, in combination with the dust protective and weather protective feature, and not in the outer shape. For example, an electrical connector-protector in accordance with the present invention could be designed by a person skilled in the art to protect any shape or form of electrical connector or receptacle that it would be desirable to protect in accordance with the present invention. Also the hardness of the resilient material used in making the electrical connector-protector would be a matter of choice, depending on the type of protection needed or desired. Obviously, a very soft material would offer no shock absorptive protection, unless it was made of such bulk as to be impractical.

What is claimed is:

1. An electrical connector protective device comprising a resilient hollow shell member of substantially uniform thickness, said shell member being open at one end, having a substantially flat interior surface and having a smooth cylindrical interior side wall, said substantially flat interior inner surface portion having an inner base area recessed in a direction away from the open end of said shell member, whereby, in the event of a blow on the end of the protector deforming the same inward, said recessed area provides additional clearance for the pins

of said electrical connector, the open end of said shell member having an inwardly directed lip portion, said lip portion having a flat inner surface adjacent to said side wall, and projected therefrom at an obtuse angle.

2. The electrical connector protective device according to claim 1 wherein the flat inner surface of said lip portion is projected from said interior side wall at angle of 120°.

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