April 29, 1969 P. E. GOLD 3,441,899

ELECTRICAL CONNECTOR

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FIG.4

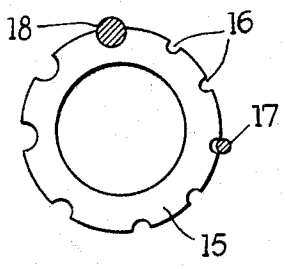
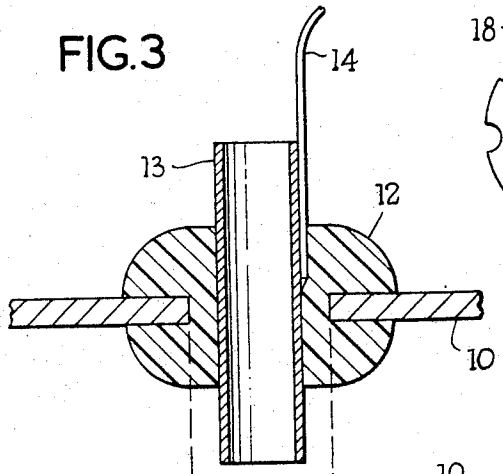


FIG.3



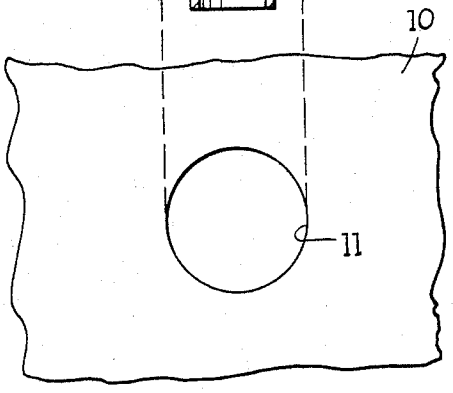


FIG.1

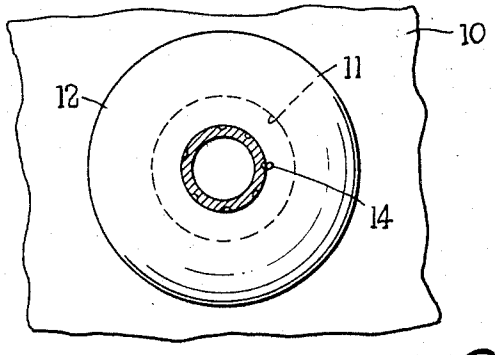


FIG.2

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ELECTRICAL CONNECTOR

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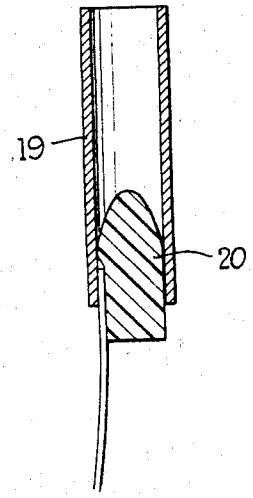


FIG.5

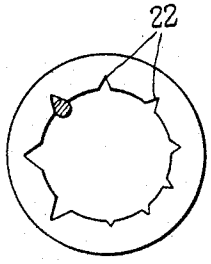


FIG.6

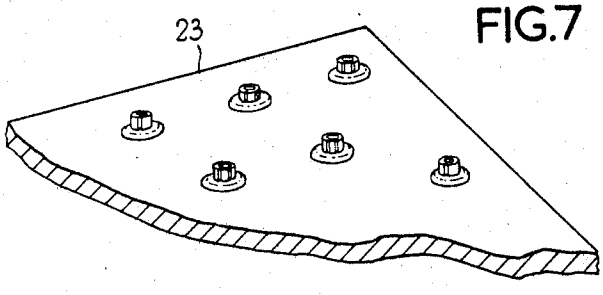


FIG.7

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3,441,899

ELECTRICAL CONNECTOR

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Int. Cl. H01r 11/20, 25/00, 29/00
U.S. Cl. 339—95 5 Claims

ABSTRACT OF THE DISCLOSURE

The basic idea underlying the invention is to have an electrically conducting stud and a resilient member which presses the wires to be connected against the stud to make the electrical connection. The resilient member may be in the form of an insulating rubber ring around the outside surface of the stud, or a rubber plug inside the stud where this is tubular.

BACKGROUND OF THE INVENTION

Field of the invention

The present invention relates to an improved electrical connector.

In the electronics industry a great deal of research is carried out which requires the making and breaking of a vast number of electrical connections. Such temporary connections are frequently effected by soldering and then desoldering, which takes up a great deal of the experimenter's time.

It is accordingly an object of the present invention to provide means whereby temporary electrical connections may be made quickly and easily but nevertheless with good electric conductivity at the joint.

SUMMARY OF THE INVENTION

An electrical connector having a rigid conductive member and a resilient insulating member. These members are formed with correspondingly cylindrical surfaces which are in resilient contact, and the cylindrical surface of the conductive member is formed with a plurality of angularly spaced longitudinal grooves. The grooves may be part cylindrical in cross section, or triangular in cross section. When the grooves are part cylindrical in cross section, they may be of different diameters. When the connector is assembled with a wire in electrical connection, the diameter of the wire is greater than the maximum width of a groove, so that knife edge line contact is made between the wire and the edges of the groove.

Other objects and advantages of the invention will be apparent to those skilled in the art.

BRIEF DESCRIPTION OF THE DRAWING

FIGURE 1 is a plan of an apertured support.

FIGURE 2 is a plan of a cylindrical stud mounted in the support with the aid of a member in the form of a grommet.

FIGURE 3 is a sectional elevation showing a wire connected to the stud.

FIGURE 4 is an enlarged plan of the stud shown in FIGURE 3.

FIGURE 5 is a sectional elevation showing a tubular stud having a resilient member in the form of a plug.

FIGURE 6 is a plan view of the tubular stud shown in FIGURE 5.

FIGURE 7 is a partly sectional perspective view of a number of connectors mounted on a connector board.

DESCRIPTION OF A PREFERRED EMBODIMENT

In FIGURE 1 is shown a support **10** in the form of a panel formed with a circular aperture **11**.

Sprung into the aperture is an insulating grommet **12** made of resilient material such as natural rubber, as shown in FIGS. 2 and 3.

Gripped firmly in the grommet is a cylindrical stud **13** which may be pushed by hand into position in the grommet. This stud is electrically conductive and a wire **14** is connected to it as shown in FIGURES 2 and 3. In order to make the connection, the wire **14** is pushed between the grommet and the stud into the position shown in FIGURE 3, where it is held firmly against the stud by the resilience of the rubber grommet which forms the connecting member.

In this example several such wires may be brought into connection with the stud, by spacing them angularly around the stud.

As shown in FIGURE 4, the cylinder **15** is formed with several angularly spaced grooves **16** running along the length of the cylinder. The grooves may be all of the same cross sectional size, in which case the wires will probably make contact as shown at **17**. Alternatively the grooves may be of different cross sectional sizes and a wire such as that shown at **18** may be inserted into a groove of substantially the same size.

In the example shown in FIGURES 1–4 the stud **13** may be solid. However, in the example shown in FIGURES 5 and 6 a tubular stud **19** is shown. The connecting member in this example is a plug **20** made of resilient material such as natural rubber. A wire **21** to be connected to the stud **19**, is pushed between the inner surface of the tubular stud and the plug **20** where it is firmly gripped by the resilience of the plug **20**.

As with the previous example, the surface of the stud to which the wires are to be connected, is formed as shown in FIGURE 6, with several angularly spaced grooves **22** running the length of the stud. The cross section of the grooves **22** is shown in FIGURE 6 to be triangular, though of course part-circular grooves as shown in FIGURE 4 may equally well be used. The outer surface of the stud **19** may be coated with an insulating material to insulate it from any support on which it may be laid. Alternatively the stud **19** may be supported in an apertured board by means of a grommet in exactly as illustrated with the first embodiment.

If a grommet is used then it would be possible to connect wires to the stud gripping them between the plug **20** and the inner surface of the stud **19**, or between the grommet and the outer surface of the stud. In this case, both the inner and outer surfaces of the tubular stud **19** may be formed with grooves.

A number of the connectors may be mounted on an apertured board **23**, as shown in FIGURE 7. This board can then be used as a convenient circuit board on which experimental circuits can be set-up. The simplicity with which the connections can be made and unmade using the connectors according to the present invention, allows modifications to any circuit set-up on the board, to be easily made and tested.

Although the connector illustrated in FIGURES 1–3, is shown connected to a support **10**, this is not an essential feature of the invention. It is intended that the stud **13** and its associated grommet **12** may be used as an interconnecting link between two wires, the connector being supported solely by the wires if necessary.

Either the grommet or the panel, or both, should be of insulating material to avoid short circuiting between the studs.

Other advantages of the above described preferred embodiments of this invention may be made by persons skilled in the art without departing from the scope and spirit of the attached claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An electrical connector comprising a rigid conductive member and a resilient insulating member, the said two members being formed with correspondingly cylindrical surfaces which are in resilient contact and the cylindrical surface of the conductive member being formed with a plurality of angularly spaced longitudinal grooves.

2. A connector as claimed in claim 1, wherein the grooves are part cylindrical in cross section.

3. A connector as claimed in claim 1, wherein the grooves are triangular in cross section.

4. A connector as claimed in claim 1, wherein the grooves are part cylindrical in cross section and are of different diameters.

5. An assembly of a wire in electrical connection with a connector as claimed in claim 1, characterized in that the diameter of the wire is greater than the maximum width of a groove, so that knife edge line contact is made between the wire and the edges of the groove.

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U.S. Cl. X.R.

24—126; 287—126; 339—126, 18