United States Patent

Raynor et al.

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[54] **ELECTRICAL CONNECTOR**

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[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.**.....**339/17 C,** 339/59 L, 339/126 R, 339/128, 339/176 L

[51] **Int. Cl.** **H01r 33/00,** H05k 1/12

[58] **Field of Search**.....339/17, 18, 36, 59–61, 339/119 L, 125 L, 126, 128, 127, 144, 145, 176 L; 313/318; 180/90; 240/8–16; 317/101, 100, 99

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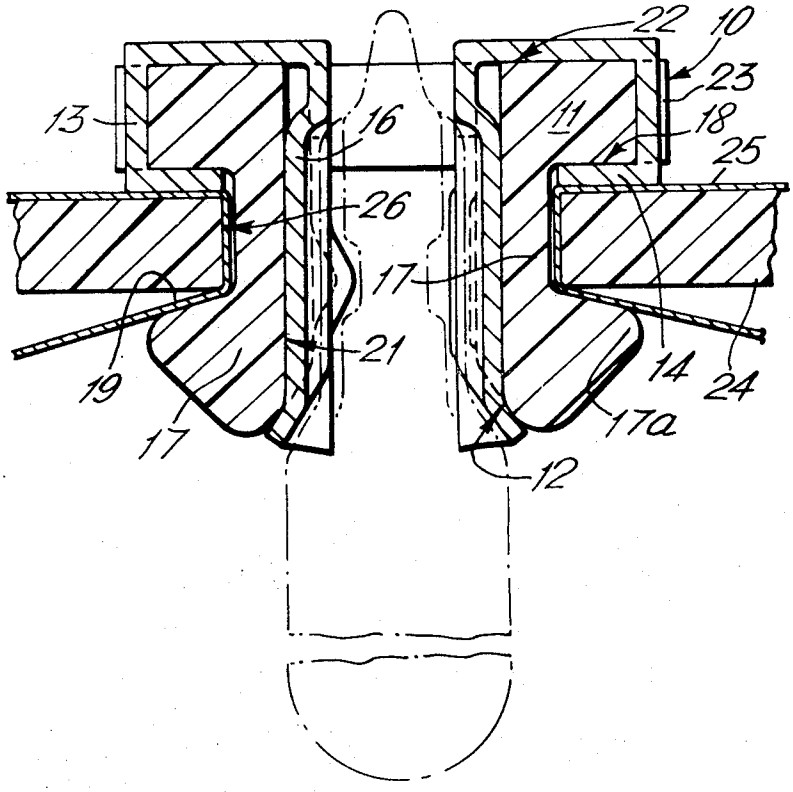
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[57] **ABSTRACT**

An electrical connector is disclosed and comprises a body part which is preferably formed as an extrusion and has a pair of contact parts secured thereto. Each contact part has a contact arm for engaging an electrical component such as a vehicle instrument and further has a contact surface located adjacent one of a pair of resilient legs formed on the body part whereby the contact surface and the leg cooperate to engage a conductive track on an insulating panel and make electrical connection therewith.

1 Claim, 2 Drawing Figures



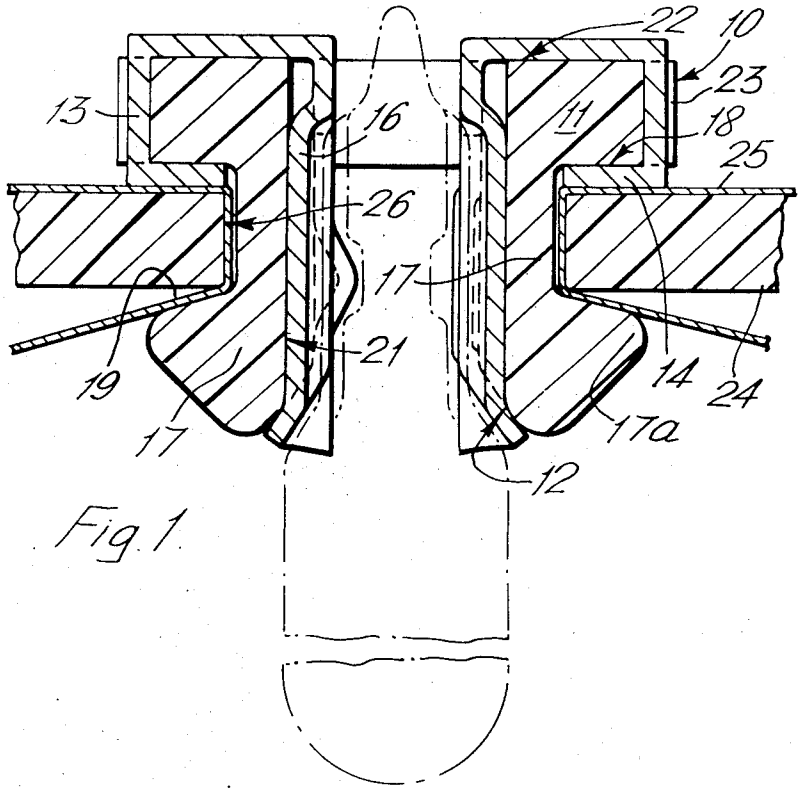

22
10
23
13
16
11
18
25
26
17
21
19
17
14
24
17a
12

Fig. 1

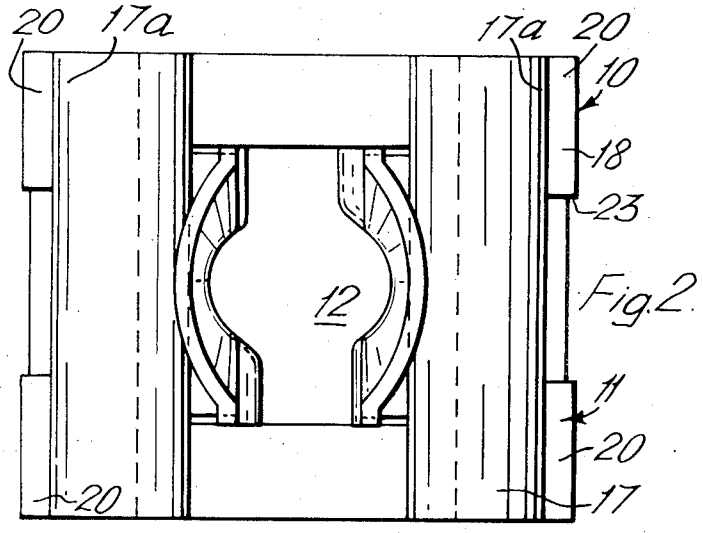

20
17a
17a
20
10
18
23
12
11
20
20
17

Fig. 2

ELECTRICAL CONNECTOR

The present invention relates to an electrical connector for making electrical contact between a conductive track on an insulating panel and an electrical component or instrument.

It is sometimes difficult to obtain a reliable electrical connection between the conductors of an insulating panel e.g. a printed circuit board and associated instruments and lights mounted on a motor vehicle dashboard.

In U.S. patent application Ser. No. 111,421 assigned to the same assignee as the present application, there is described and claim an electrical connector for electrically connecting an electrical component and a conductive track on an insulating panel having an aperture to receive the connector, comprising a body part extruded from resilient electrically insulating material and having generally parallel legs projecting from one of a pair of opposite surfaces of the body part adapted to pass through the panel aperture latchingly to engage the connector and the panel, a bore extending between the opposite surfaces of the body part for receiving the electrical component, and an electrically conductive contact part mounted on the body part overlying at least a portion of of one of the opposite surfaces for contacting a panel conductive track and having a resilient contact arm to engage a contact element of the electrical component when received in the bore of the body part.

Preferably the contact part overlies the surface of the body part remote from the legs and has two resilient contact arms projecting above that surface and overlying the bore, the ends of the contact part engaging opposite ends of the body part.

It is sometimes desirable to interconnect an electrical component and two conductive tracks on an insulating panel in order that reception of the electrical component in the connector will complete an electrical circuit.

An electrical connector for electrically connecting an electrical component and a conductive track on an insulating panel having an aperture to receive the connector, according to the present invention, comprises, a body part extruded from resilient electrically insulting material and having a pair of generally parallel legs projecting from one of a pair of opposite surfaces of the body part adapted to pass through the panel aperture latchingly to engage the connector and the panel, a bore extending between the opposite surfaces of the body part for receiving the electrical component, and two electrically conductive contact parts mounted on the body part overlying at least a portion of one of the opposite surfaces for contacting a panel conductive track and each having a resilient contact arm extending between the legs of the body part to engage a contact element of the electrical component when received in the bore of the body part.

An electrical assembly according to the present invention comprises a connector, an apertured insulating panel having a conductive track, and an electrical component, the legs of the connector being received in the panel aperture with a contact part of the connector in electrical engagement with the conductive track, and the resilient contacts in electrical engagement with the contact element of the instrument.

The present invention will now be described by way of example with reference to the accompanying drawings in which:

FIG. 1 is a median diagrammatic section of an electrical connector mounted on a board carrying a flat conductor; and

FIG. 2 is a bottom plan view of the electrical connector of FIG. 1.

The electrical connector **10** shown in FIGS. 1 and 2 comprises a body part **11** made from an extruded strip of resilient, electrically insulating material such as polypropylene or nylon, and a pair of contacts **12** formed from a strip of electrically conductive material such as brass.

The body part **11** is generally rectangular in plan view and has a pair of substantially parallel spaced apart legs **17** extending outwardly from one surface **18**. Each leg **17** is formed at its free end with an outwardly projecting rib **17a** defining a circuit board edge receiving recess **19** between the rib **17a** and the surface **18**. A through hole **21** extends, at a position between the legs **17**, from the surface **18** to an opposite surface **22**. Each side of the body part **11** is formed with a pair of spaced apart parallel extensions **20** (FIG. 2) which extend outwardly from the body part **11** and form between them a recess **23** which serves to position a contact **12** on the body part **11**.

Each contact **12** is formed with a pair of substantially parallel arms **13** and **16**. The arm **13** extends between one pair of the extensions **20** and is seated in the recess **23**. The free end portion **14** of the contact **12** is of arcuate cross-section and is turned inwardly to cover a part of the surface **18** and to make contact with a conductor **25** on a board **24**. The arm **16** extends through the hole **21** and is held against one wall of the hole **21** by the free end of the arm which is curved outwardly about the free end of the leg **17**.

The connector **10** is mounted on a printed circuit board **24** by pushing the legs **17** of the connector through a hole **26** in the board **24**. The resilient legs **17** of the connector are bent inwards as the ribs **17a** pass through the hole **26** and return to their normal position upon completion of the insertion operation. The connector **10** is thus locked in position on the board **24** by the ribs **17a** which also urge the conductor **25** on the board **24** and the inturned free ends **14** of the arms **13** together thus ensuring good electrical contact between the conductors **25** and the contacts **12**.

The board **24** can be arranged immediately behind the dashboard (not shown) of a vehicle with the legs **17** of the body part **11** extending towards the dashboard. A capless lamp bulb (not shown) may be positioned in the connector **10** in the board **24** to act as a warning light showing on the dashboard, each bulb contact being in contact with one of the contact parts **12**. A conductive path is thus made between the conductors **25** of the board **24** and the lamp bulb. The connector **10** can alternatively be used to connect a contact pin of an instrument mounted on a vehicle dashboard to a printed circuit board. In this case the two contacts **12** may be used to connect the instrument contact pin to a single conductor **25**.

It is possible to reduce the width of the contacts **12** and to displace them laterally, one towards one end of the connector and the other towards the other end so

that the contacts correspond to the assymetric arrangement reduces the amount of metal used in the contacts substantially.

While the invention has been described with reference to a drawing showing a flexible conductor mounted on the board, and extending through the board, the invention could equally well be used with a laminated printed circuit board in which the conductor is stuck to a surface of the board. In this arrangement the conductor would not extend through the hole in the panel.

We claim:

1. An electrical connector for electrically connecting an electrical component and a conductive track on an insulating panel having an aperture to receive the connector, the connector comprising a body part of generally constant cross-sectional configuration, permitting extrusion thereof, and formed from resilient electrically insulating material, a pair of generally

parallel legs projecting from one of a pair of opposite surfaces of the body part, each said leg having a recess for engaging the panel aperture upon passing said legs through the aperture, a bore extending between the opposite surfaces of the body part for receiving the electrical component, and a pair of electrically conductive contact parts mounted on the body part overlying at least a portion of the surface of the body part remote from the legs, each said contact part having a contact surface for contacting a panel conductive track and further having a resilient contact arm extending through said bore between the legs of the body part to engage a contact element of the electrical component when received in the bore of the body part, the free end of the resilient contact arm being curved outwardly away from said bore for engaging a leg of the body part to secure the conductive contact part to the body part.

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