May 30, 1967 J. J. MAY ETAL 3,322,885

ELECTRICAL CONNECTION

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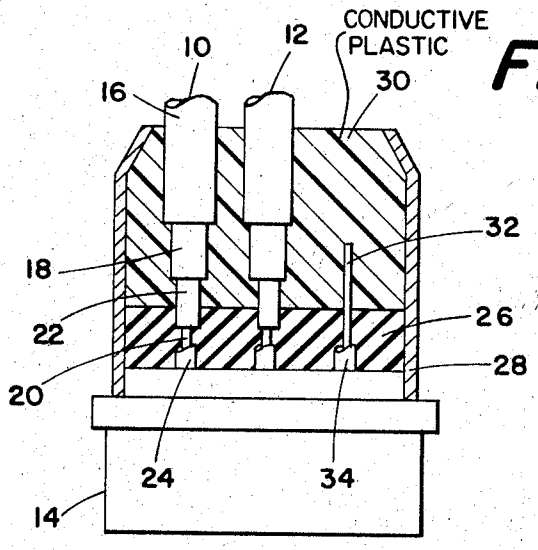


Fig. 1

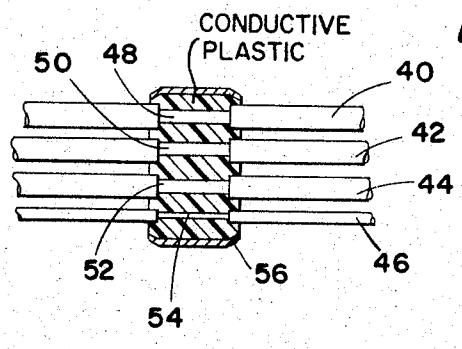


Fig. 2

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ELECTRICAL CONNECTION

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5 Claims. (Cl. 174—78)

This invention relates generally to an electrical connection between conductors and more particularly to an improved electrical connection between the shields of shielded wires and the method of making it.

When a plurality of electrical connections to a piece of apparatus must be made, it is common practice to bind the separate wires into a single cable and use special connectors having multiple connector pins. When the wires are the shielded type, it is also desirable to connect the shields to each other and to a grounding point. This connection is commonly made by using a ribbon of conductive material and soldering it to each of the shields. This method is time consuming, bulky, and occasionally results in inadequate connections.

It is, therefore, an object of this invention to provide an easily fabricated and reliable connection for the shields of shielded wires.

In a preferred form of the invention, the insulation covering the shields of the wires is stripped at the point where the connection is to be made. A potting mold or boot is positioned about the wires at this point, and a curable plastic material containing conductive particles is placed in the boot on the shields of the wires. The plastic material is cured, and the connection is complete. The conductive particles electrically connect the shields together.

The invention will be better understood from the following description referring to the drawing in which:

FIGURE 1 is a schematic, partially in cross-section, of one embodiment of the invention in which a plurality of wires have their shields connected; and

FIGURE 2 is a schematic, partially in cross-section, of another embodiment of the invention.

In FIGURE 1, two shielded wires **10** and **12** are shown connected to connector **14**. Each wire has an outer layer of insulation **16** covering a conductive shield **18**. The shield is separated from the wire conductor **20** by a second layer of insulation **22**. Connector **14** is provided with a plurality of pins or sockets, not shown, which are mated with those on a similar connector. Each pin or socket of connector **14** has an inner solder cup **24** to which the wire conductor **20** is soldered. To insulate these soldered joints, a layer of dielectric potting compound **26** is poured into the potting mold and boot **28**. A suitable room temperature curing potting compound is Shell's Epon 828. This layer terminates below the exposed conductive shield **18** of wires **10** and **12**.

In accordance with the invention, it is desired that an electrical connection be established between the conductive shields **18** of the respective wires. A layer of conductive plastic **30** is, therefore, poured into boot **28** and cured. Conductive plastic is used here to described a dielectric plastic which acquires conductive characteristics by mixing into it conductive particles. A suitable conductive plastic is Epoxy Conductive Cement sold by Hysol

Corp. of Olean, N.Y., under the designation K8–4238. This plastic is also a room temperature curing type.

Depending upon the needs of the situation, boot **28** can be conductive or insulating. If boot **28** is insulating, it would most likely be preferable to add a layer of dielectric compound above the layer of conductive plastic **30**.

If it is desired that the connection between shields be carried through the connector, a length of uninsulated wire conductor **32** is soldered to an unused solder cup **34**. Wire **32** is given a length sufficient to extend into the conductive plastic layer **30**.

Obviously connections similar to those made to connector **14** may be made to the connector with which connector **14** will mate.

More generally, the invention may be considered as shown by FIGURE 2. A plurality of shielded wires **40**, **42** and **44** have had the insulation covering their shields removed at a point where it is desired to electrically connect the shields. In addition, in this example, it is desired to connect the shields to a ground. Consequently, an ordinary insulated wire **46** is included in the bundle of wires. The exposed shields **48**, **50** and **52** of wires **40**, **42** and **44**, respectively, as well as a portion **54** of wire **46** from which the insulation has been removed, are aligned in a potting boot **56**. Boot **56** is then filled with conductive plastic which is cured. The shields of wires **40**, **42** and **44** are thereby electrically connected to each other as well as to wire **46**. Wire **46** can be connected to a ground at a convenient location.

While particular embodiments of electrical connections according to the invention have been illustrated and described, it will be obvious that changes and modifications can be made without departing from the spirit of the invention and the scope of the appended claims.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. An electrical connection for a plurality of shielded wires comprising:

a mass of conductive plastic in contact with the shields of said wires; and

an uninsulated portion of a ground wire in contact with said mass of conductive plastic.

2. An electrical connection for a plurality of shielded wires comprising:

a potting mold surrounding said wires at a point where the insulation has been removed from the shields, said mold being filled with a mass of conductive plastic in contact with said shields; and

an uninsulated portion of a ground wire in contact with said mass of conductive plastic.

3. In combination with a connector for a plurality of wires an electrical connection for shielded wires comprising:

a first layer of plastic insulating material covering the uninsulated connections of the wire conductors to the solder cups of said connector,

said first layer extending over the insulation of the shielded wire conductor, and

a second layer of a conductive plastic in contact with the shields of said wires.

4. The combination of claim **3** further comprising:

a length of uninsulated wire soldered to a solder cup

of said connector and extending into said second layer.

5. In combination with a connector for a plurality of wires an electrical connection for shielded wires comprising:

a potting mold surrounding said wires at the connector,

a first layer of plastic insulating material in said potting mold covering the uninsulated connections of the wire conductors to the solder cups of said connector, and

a second layer of a conductive plastic in said potting mold in contact with the shields of said wires.

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