Feb. 9, 1971 L. BRANDEN ET AL 3,562,699

ELECTRIC CONTACT AND BASE PLATE ASSEMBLY

Filed April 17, 1968

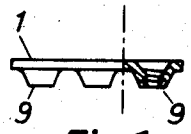


Fig.1



Fig.2

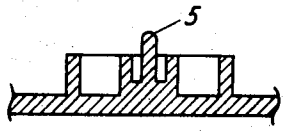


Fig.3

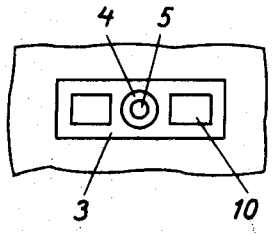


Fig.4

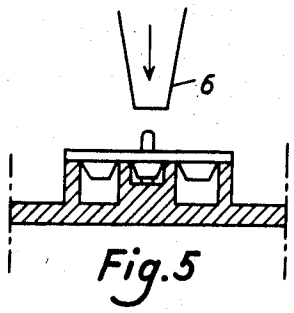


Fig.5

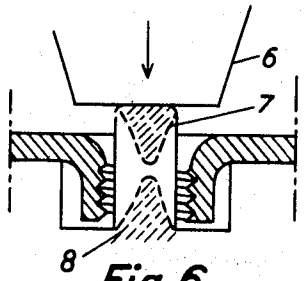
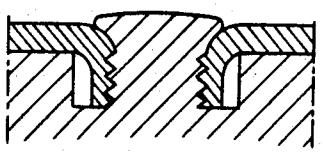


Fig.6


Fig.7

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ELECTRIC CONTACT AND BASE PLATE ASSEMBLY

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U.S. Cl. 339—220 1 Claim

ABSTRACT OF THE DISCLOSURE

A thermoplastic base plate with at least two recesses, one of which has a projection extending therefrom, has a contact piece of metal connected thereto. The contact piece has at least two apertures, one of which encircles the projection of the base plate, and is fastened to the base plate by means of riveting the projection to the contact piece.

The invention refers to a method of fastening contact pieces on a base plate of thermoplastic material, especially for the manufacturing of connection boxes for telephone instruments.

In the known devices of this kind the contact pieces are generally fixed to the base plate by means of screws, rivets or eyelets or by bent lugs with the use of apertures in the base plate. This presents a disadvantage, especially for boxes for wall mounting, because in case of humidity in the wall where a box is mounted, the connections are not protected against this humidity.

An object of the invention is to avoid this disadvantage and to provide a simple and economic way of fastening the contact pieces on a plate of thermoplastic material without the use of apertures in the base.

The invention is characterized by the fact that the plate is provided with projections suitable to be used as rivets, that rivet-holes are taken up in the contact pieces, the inside of the holes being provided with grooves such as screw-threads, and that the driving of a rivet after having slipped a contact piece thereon is effected by means of a mandrel arranged to ultrasonically vibrate.

The invention will be further described by means of an embodiment with reference to the acompanying drawing in which:

FIGS. 1 and 2 show a contact piece,

FIGS. 3 and 4 show a base plate for carrying a contact piece,

FIG. 5 shows the contact piece located on the base plate,

FIG. 6 shows the rivet at the driving instant and FIG. 7 shows the final form of the rivet.

FIGS. 1 and 2 show a contact piece **1** with three holes, the two end holes of which are destined to receive screws and the center hole for riveting of the contact piece.

The holes, which are all equal, are obtained by "flanging" and are thereafter screw-threaded. For supporting the contact piece there is arranged a base plate **3** on a plate **2** which base is provided with recesses to give room for the hole flanges **9** of the contact piece. The intermediate recess **4** that is of a circular form, has in its center a projection **5** suitable to be used as a rivet. The contact piece is placed in position, see FIG. 5, and then by means of a mandrel **6**, vibrating at an ultrasonic frequency,

the rivet is driven (FIG. 6). When driving the rivet under vibration the same is heated up, so that the surface layers of the rivet are softened. In a conical portion **7** near to the mandrel as well as in another conical portion **8** at the base of the rivet, the temperature, however, remains relatively low because of the contact with the mandrel and the connection to the base plate, respectively, so that these portions do not soften. When pressing down the mandrel the conical portions are forced towards each other, whereby the soft portions of the rivet are forced radially outwards to fill the screw-threads of the hole. The final form of the rivet is shown in FIG. 7. Because the flanges **9** of the screw holes engage the square recesses **10** a rotational movement of the contact piece when tightening the screw is avoided and the rivet is not exposed to a too big torsional stress.

By fastening the contact piece in this way the necessity of having apertures in the base plate is eliminated, so that the contacts are protected against humidity from the supporting surface.

The method is especially suitable for automatic production processes. If a number of contact pieces are to be fastened simultaneously on each base plate a mandrel is arranged for each contact piece, so that all the rivets may be driven in one working operation.

We claim:

1. An electric contact assembly comprising: a base plate of thermoplastic material, said base being provided with at least two recesses, one of said recesses having a rectangular cross-section, the other of said receses having a circular cross-section, a projection extending upward and outward from said other recess; and a contact piece of metal, said contact piece being provided with two circular openings, outwardly extending circular flanges disposed around the peripheries of said circular openings, the inner surfaces of each of said flanges being provided with screw threads, one of said flanges extending into said one recess, the other of said flanges extending into said other recess and encircling said projection with the end of said projection overlying the region of said contact piece adjacent the periphery of the associated circular opening and the shaft of said projection being enmeshed with the screw threads of the flange associated with said second opening.

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