

INSULATING SUPPORT FOR ELECTRICAL CONNECTORS

Filed June 19, 1967

Fig. 1.

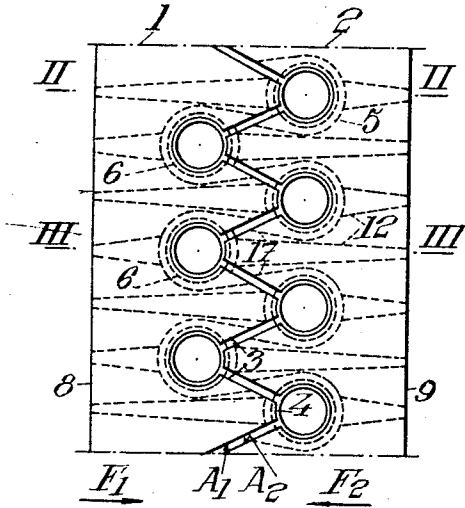


Fig. 2.

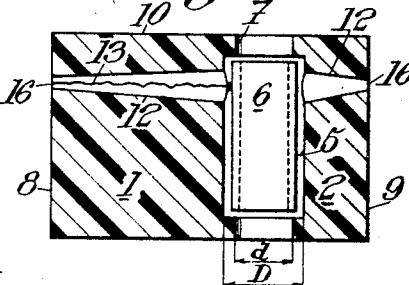


Fig. 3.

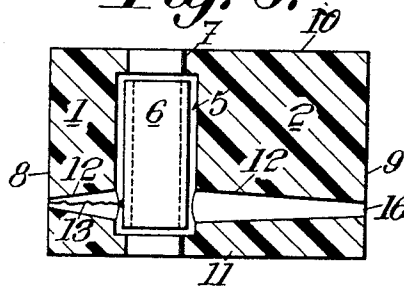


Fig. 4.

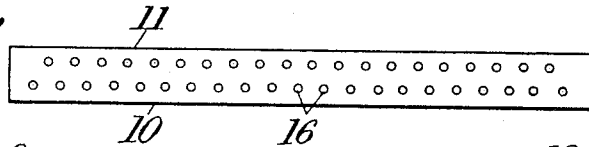


Fig. 5.

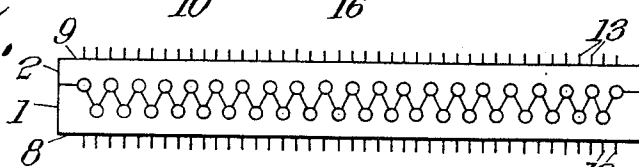


Fig. 6.

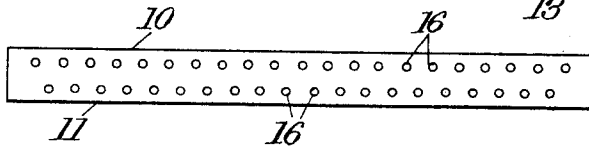


Fig. 7.

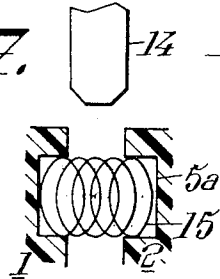
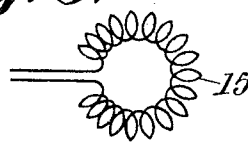


Fig. 8.



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2

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## INSULATING SUPPORT FOR ELECTRICAL CONNECTORS

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Filed June 19, 1967, Ser. No. 646,823

Claims priority, application France, June 22, 1966, 66,420

U.S. Cl. 339—207

Int. Cl. H01r 13/50, 13/22

6 Claims

### ABSTRACT OF THE DISCLOSURE

An insulating support for electrical connectors comprising a block made of two elements having complementary edges fitting in each other, each of said edges consisting of a plurality of triangular saw teeth juxtaposed in one direction and extending across said direction, the bottoms of said teeth being provided with cylindrical cavities parallel to said teeth and extending throughout said pieces, and conducting sockets fitting in said cavities.

The present invention relates to insulating supports adapted to accommodate a plurality of electrical connectors which may be disposed in a regular fashion with respect to one another.

According to this invention the insulating support comprises a block made of two pieces of an insulating material having cooperating indented edges of complementary respective shapes fitting with each other, each of said edges consisting of a juxtaposition in one direction of saw teeth, preferably triangular, extending across said direction, thus forming recesses and projections, the bottoms of said recesses forming cylindrical cavities parallel to the ridges of said projections and extending throughout said pieces, said ridges being shaped and located to complete the periphery of said cylindrical cavities, and female connector elements of an electricity conducting material fitting in said cylindrical cavities coaxially therewith.

A preferred embodiment of the present invention will be hereinafter described with reference to the appended drawings given merely by way of example and in which, FIG. 1 is a plan view of a portion of the insulating support according to this invention;

FIG. 2 is a vertical sectional view on the line II—II of FIG. 1;

FIG. 3 is a vertical sectional view on the line III—III of FIG. 1;

FIG. 4 shows on a smaller scale the rear of an insulating support according to this invention;

FIG. 5 is a top plan view corresponding to FIG. 4;

FIG. 6 is a front side view of the support of FIG. 5;

FIGS. 7 and 8 are diagrammatical views at right angles to each other of a female connector element to be fitted in the insulating support.

According to the embodiment of FIGS. 1, 2 and 3 the insulating support comprises, in combination, a block of an insulating material made of two pieces 1, 2 having cooperating indented edges of complementary respective shapes fitting with each other, each of said edges consisting of a juxtaposition in one direction of triangular saw teeth extending across said direction, thus forming recesses 3 and projections 4, the bottoms of said recesses 3 forming cylindrical cavities 5 parallel to the ridges of said projections and extending throughout said pieces 1, 2, said ridges being shaped and located to complete the periphery of said cylindrical cavities 5, and connector

sockets 6 of an electricity conducting material fitting in said cylindrical cavities coaxially therewith.

In other words, the whole is such that, when elements 1 and 2 are moved toward each other in the respective directions of arrows  $F_1$  and  $F_2$ , so as to bring faces  $A_1$  and  $A_2$  close to each other, as shown by FIG. 1, the projections 4 of each of the parts 1 and 2 cooperate with the recesses 3 of the other part to limit said cavities 5.

Cylindrical cavities 5, which, in the embodiment illustrated by the drawing, are of circular cross section, open into the upper and lower faces, 10 and 11, respectively, of insulating support 1-2 through holes of a diameter  $d$  smaller than the diameter  $D$  of the middle portions of said cavities 5. Connector sockets 6, of cylindrical shape, are adapted to fit in cavities 5 with a lateral and vertical play. The inner diameter of sockets 6 is slightly smaller than diameter  $d$ .

Cylindrical cavities 5 communicate with recesses 3 through passages 17 of a width substantially greater than the outer diameters of sockets 6 to permit introduction of said sockets 6 into said cavities 5.

Cavities 5 communicate with the faces 8 and 9 of the block formed by pieces 1 and 2 through channels 12 extending through said pieces 1 and 2 on either side of cavities 5 in directions substantially parallel to the faces 10 and 11 of the support. Advantageously, as shown, said channels 12 are of frustoconical shape, the larger ends being those opening into cavities 5.

As shown by FIGS. 2 and 3, the pair of channels 12 leading to each cavity 5 is located close to one end of said cavity 5. For two consecutive cavities 5 (for instance as shown respectively by FIGS. 2 and 3), said channels 12 are located at one end of one cavity 5 (FIG. 2) and at the other end of the other cavity 5 (FIG. 3).

These channels 12 serve to the passage of conductor wires 13 coming from the outside of the support and connected to sockets 6.

FIGS. 4 and 6 show the outlets 16 of channels 12.

Each cavity 5 being provided with a pair of channels 12, it is possible to provide sockets 6 either with one wire 13 or with two wires 13 according to the needs. The two channels 12 corresponding to a cavity 5 may be in line with each other, as shown by the drawings. But one of them might open close to one end of cavity 5 and the other close to the other end thereof. In this last case, channels 12 are located at equal distances from the faces 10 and 11 of the support, so as to permit the use of sockets 6 provided with their conductor wires 13 and adapted to fit with either position of said channels. Wires 13 are adapted to be connected, on the outside of faces 8 and 9, to any desired circuit and, in particular, they may be directly connected to printed circuits applied on said faces 8 and 9 of the support.

The inside of socket 6 may be arranged in suitable manner in order to ensure a good contact with a pin (such as 14 in FIG. 7). The inside of socket 6 may be provided with resilient conductor means such as a helical or coil spring or a return spring.

FIGS. 4, 5 and 6 show a support according to the present invention intended to accommodate forty one connector sockets 6 and having eighty two conductor wires 13 adapted to ensure contact between circuit elements (not shown) on the outside of the support and the forty one sockets 6. FIGS. 4 and 6 show the outlets 16 of channels 12 opening into faces 8 and 9. It will be seen that channels 12 are disposed alternately in two planes parallel to the upper face 10 and the under face 11 of the support. FIG. 5 shows the cylindrical cavities containing sockets 6. Said sockets are adapted to accommodate the connector pins. Said pins are advantageously disposed upon an insulating piece of the same

dimensions as the above described support, the distribution of the pins on said insulating piece being similar to the distribution of the sockets on support 1-2. Thus, when the insulating piece is applied for instance upon the face 10 of support 1-2, the pins engage the corresponding sockets 6, respectively. The pins may be, in a known manner, directly moulded in the body of the insulating piece or fixed thereto through resilient means.

Before assembling together the elements 1 and 2 of the support, sockets 6, fitted with their conductor wires 13, are introduced through passages 17 into cylindrical cavities 5, said wires 13 extending through channels 12. Then the assembly faces A and B of pieces 1 and 2 are brought together so as to hold sockets 6 in cylindrical cavities 5. Pieces 1 and 2 are secured to each other through external means, for instance bolts (not shown by the drawings) such that said faces A and B, once assembled together, may be either in contact with each other or, as shown by the drawings, slightly distant from each other.

In a modification illustrated by FIGS. 7 and 8, each socket 6 is replaced by a metal spring 15 wound in toroidal fashion and held in a cylindrical cavity 5a made, similarly to cavity 5, by the assembly of parts 1 and 2.

One advantage of the present invention is to provide a support capable of accommodating within a small volume a great number of connectors, owing to a suitable distribution of the sockets and of the conductor wires connected therewith.

Another advantage of this invention is that the support permits of easily selecting the contacts necessary for a given use.

Still another advantage is that this support is easy to make because the two parts thereof are similar to each other and can be obtained by moulding in the same mould.

In a general manner, while the above description discloses a preferred embodiment of the invention, it should be well understood that said invention is not limited thereto as there might be changes made in the arrangement, disposition and form of the parts without departing from the present invention as comprehended within the scope of the appended claims.

What I claim is:

1. An insulating support for an electrical connector

which comprises a block made of two pieces of an insulating material having cooperating indented edges of complementary respective shapes fitting in each other, each of said edges consisting of the juxtaposition in one direction of saw teeth extending across said direction, thus forming a row of recesses and projections, the bottoms of said recesses forming cylindrical cavities parallel to the ridges of said projections and extending throughout said pieces, said ridges being shaped and located to complete the periphery of said cylindrical cavities, and a plurality of female connector elements of an electricity conducting material fitting in said cylindrical cavities, respectively, coaxially therewith.

2. An insulating support according to claim 1 wherein said saw teeth are triangular.

3. An insulating support according to claim 1 wherein said cylindrical cavities are of circular cross section.

4. An insulating support according to claim 1 wherein said female connector elements are cylindrical sockets.

5. An insulating support according to claim 1 wherein said female connector elements are metallic windings forming annular springs of toroidal shape.

6. An insulating support according to claim 1 wherein said two pieces are provided with a plurality of pairs of channels, the two channels of each pair extending between one cavity and the faces of said pieces parallel to said rows of recesses and projections, said channels being disposed in staggered fashion, with one channel of a pair starting from one end portion of the corresponding cavity and the other channel of this pair starting from the other end portion of said cavity.

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U.S. Cl. X.R.