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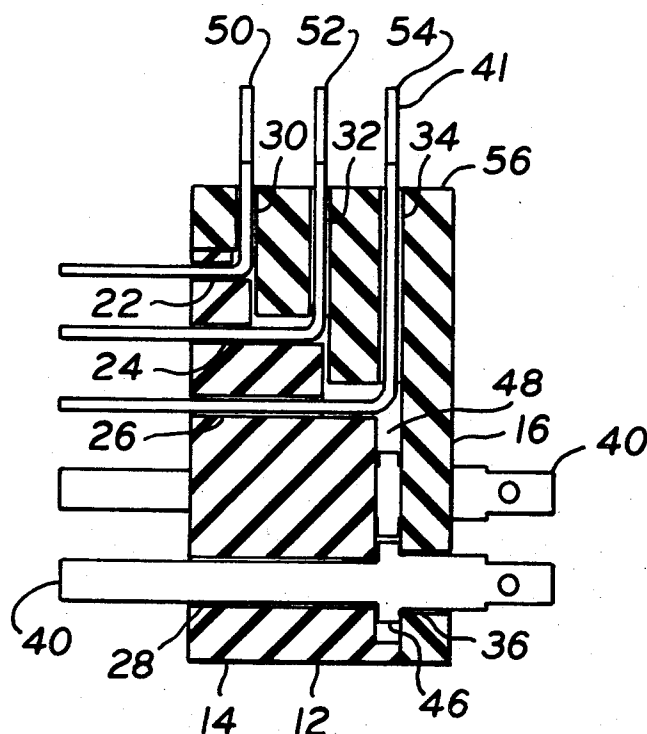
[54] ELECTRICAL CONNECTOR

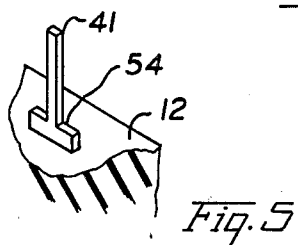
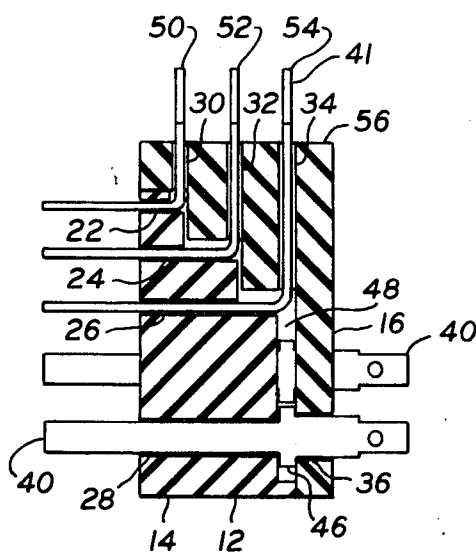
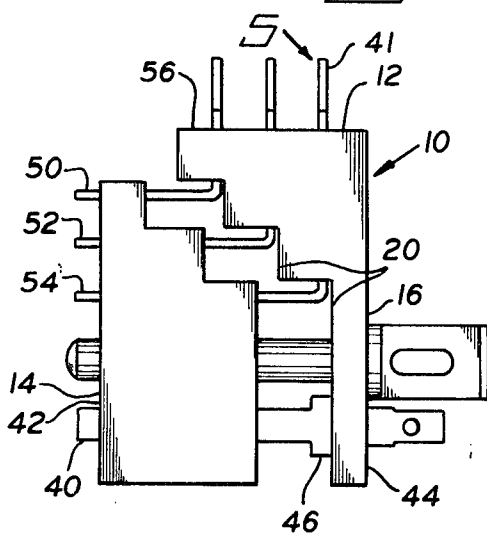
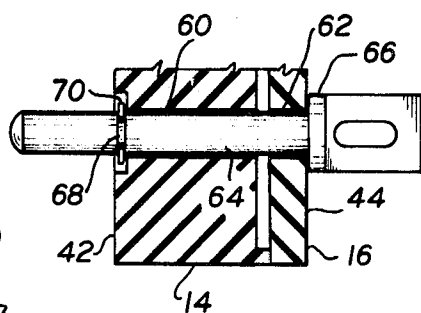
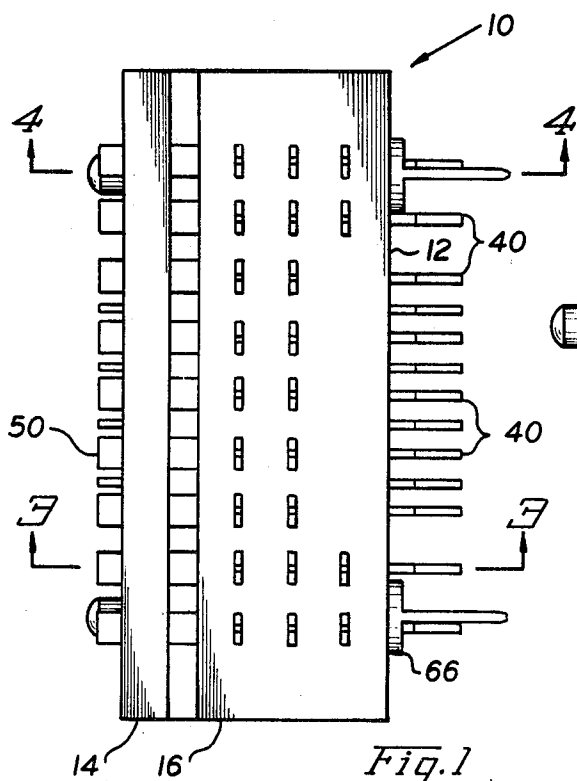
4 Claims, 5 Drawing Figs.

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 [51] Int. Cl. H01r 13/62
 [50] Field of Search 339/17, 64,
 176, 198, 196, 206-208, 210

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ABSTRACT: An electrical connector assembly for straight through connection and connection to a printed circuit board including mating connector body halves and a plurality of metallic contact elements adapted to be assembled in the connector halves. Configuration of connector halves and contact elements will position the latter in the connector without need for locking and positioning devices.





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ELECTRICAL CONNECTOR

This invention relates to an electrical connector and, more particularly, to an improved and novel electrical connector assembly adapted to be connected to or plugged into a printed circuit board, as well as into a standard female connector.

Electrical connectors which consist essentially of molded insulating material connector bodies into which metallic contact members are positioned are widely known and used in the technology. Among such connectors are those which are used in conjunction with printed circuit systems, or with standard female electrical connectors or even in combination with both standard and printed circuit electrical systems. Although many types of electrical connectors are known which satisfactorily provide the desired operating characteristics and functions demanded by the technology, they are subject to certain drawbacks and disadvantages in their manufacture. Thus, it is quite difficult to assemble and accurately locate a plurality of electrical contact members, which may each consist of a metallic plate, in a molded insulator or connector body. One solution to this problem has been the formation of the connector body of two complementary or mating halves into which the metallic contact plates are inserted and then positioned. However, it has been difficult, if not impossible, to lock and accurately maintain the electrical contact members or metallic plates in the insulating connector bodies without using complex assembly methods and mechanical contrivances. Consequently, presently employed electrical connectors are generally expensive to manufacture and uneconomical to use for many installations.

The electrical connector assembly according to the present invention obviates and ameliorates the shortcomings encountered in prior art electrical connectors by providing a novel and improved multiple-contact connector adapted for printed circuit board and/or standard female connector installation. For this purpose, the present inventive electrical connector assembly contemplates an insulating material connector body formed of two mating halves, and pluralities of electrical contact members for straight through connection and connection to a printed circuit board, which are readily inserted into the mating halves and assembled in a simple and economical manner.

Accordingly, it is an object of the present invention to provide an improved and novel electrical connector assembly.

Another object of the present invention is to provide a novel electrical connector assembly in which the electrical contact elements may be assembled in the insulating connector body in a simple and ready manner.

Yet another object of the present invention is to provide an electrical connector assembly as described herein, which includes an insulating connector body formed of two mating halves and which further includes a plurality of metallic plate contact elements which may be assembled and positioned in the connector body by means of simple manipulation.

A further object of the present invention is to provide an electrical connector assembly for a printed circuit board and/or a standard female connector as described herein, which incorporates a connector body formed of mating halves, and including pluralities of contact elements adapted to be assembled and locked into said connector body halves through a simple and economical manipulative procedure.

A still further object of the present invention is to provide an electrical connector assembly for both straight through male contacts for use with wire terminations and for printed circuit board contacts.

Another object of the present invention is to provide an electrical connector assembly which allows the contacts to float in order to obtain the best possible connection with the mating connectors.

These and other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following

detailed description when considered in connection with the accompanying drawings, in which:

FIG. 1 is a plan view of an electrical connector assembly according to the present invention, shown with the connector body portions in slightly separated position;

FIG. 2 is an end view of the electrical connector assembly of FIG. 1;

FIG. 3 is a sectional view along line 3—3 in FIG. 1, with the connector shown in fully assembled positions;

FIG. 4 is a fragmentary sectional view along line 4—4 in FIG. 1, with the connector shown in fully assembled position; and

FIG. 5 is an exploded view of a typical end of a bent angle connector of FIG. 2.

Referring now to the drawing, wherein like reference characters designate like or corresponding parts throughout the several views, there is illustrated an electrical connector assembly 10. The connector assembly 10 includes a connector body 12 formed of an insulating material well known in the electrical art.

As shown, particularly in FIGS. 1 and 2, the connector body 12 comprises a first half portion 14 and a second half portion 16 adapted to mate with the former when the assembly 10 is in an assembled condition. The mating halves 14, 16 include complementary stepped surfaces 18, 20 which are dimensioned to meet at predetermined portions when the halves 14, 16 are in assembled position, as illustrated in FIG. 3 of the drawing.

A plurality of apertures or slits 22, 24, 26 and 28 extend through connector half 14. A similar plurality of apertures or slits 30, 32, 34, and 36 extend through connector half 16 as shown in FIG. 3. As illustrated, elongate flat metal contact elements 40 extend through halves 14, 16 by projecting through apertures 28 and 36 so that the ends of elements 40 extend outwardly of the opposed walls 42, 44 of connector body 12. The central portion of each of the plate elements 40 includes a pair of extensions or projections 46 which are wider than the apertures 28, 36. The projections 46 are adapted to be positioned in a gap 48 between the adjacent walls or surfaces 18, 20 on mating halves 14, 16.

A plurality of angularly bent flat metal contact elements 50, 52, 54 are adapted to each extend respectively through apertures 22, 30, 24, 32; and 26, 34 in connector halves 14, 16. The ends of the contact elements are adapted to project from wall 42 of connector half 14, and from perpendicularly adjacent wall 56 on connector half 16. As shown most clearly in FIG. 5, the end of one of the angular bent contact elements 54 has a conventional raised tail 41, which is adapted to be inserted into a printed circuit board. Although not shown, all of the angular bent contact elements have this conventional end for connection to a printed circuit board.

When assembling the connector body 12 with the various metallic contact elements 40, 50, 52, and 54, the contact elements 40 are inserted in apertures 36 in connector half 16 until the projections 46 contact surface 20. Similarly, the upwardly extending portions of contact elements 50, 52, 54 are inserted, respectively, through apertures 30, 32 and 34 in connector half 16. Connector half 14 is now positioned adjacent to the free ends of the various contact elements so that the free ends of contact elements 40 align with apertures 28 in surface 18. Concurrently, the free ends of contact elements 50, 52, 54 are lined up, respectively, with apertures 22, 24 and 26 in surface 18 of connector half 14. The connector halves 16 are now pressed or assembled together so as to form a closed connector body construction 12 as illustrated in FIG. 3 of the drawing. This, in effect, will lock the various contact elements 40, 50, 52, 54 between the assembled halves 14, 16. Thus, plate elements 40 are locked in as a result of the projections 46 being restricted to movement or floating in gap 48 between stepped connector surfaces 18, 20. Similarly, the bent configuration of contact elements 50, 52, 54 will restrict their movement within connector body 12 as formed by assembled connector halves 14, 16, but will not prevent the desirable float thereof.

Since it may be desirable to lock the assembled connector halves 14, 16 together, one or more coaxial apertures or holes 60, 62 may be formed through connector halves 14 and 16. Each of the holes 60, 62 may receive a pin 64 having an enlarged head portion 66 at one end. The head portion 66 may be positioned in holes 60, 62. As the connector halves 14, 16 are assembled, a groove 68 on the pin 64 adjacent to the shank end thereof is adapted to align with an annular recess in wall 42 of connector half 14. A suitable snapping or fastener 70 may be inserted in groove 68 so as to maintain the connector halves 14, 16 in assembled and locked position.

From the foregoing, it becomes clearly obvious that the present connector assembly may be easily and economically assembled without the need for expensive and uneconomical tools and assembly procedures and provides floating contacts for ease of alignment with a mating connector.

The foregoing disclosure relates to only a preferred embodiment of the invention, and is intended to cover all changes and modifications of the example of the invention herein chosen for the purposes of disclosure, which do not constitute departures from the spirit and scope of the invention.

What is claimed is:

1. An electrical connector assembly, adapted to be easily assembled, comprising in combination;
 - an electrical connector body formed of an insulating material, said connector body comprising a pair of mating halves, at least portions of the mating surfaces of said connector body halves having generally stepped complementary configurations,
 - a plurality of first electrical contact members each extending through an apertures in said mating halves so as to project through opposed surfaces on said connector

body,

said first electrical contact members comprising elongate metallic elements having a projecting means thereon which is positioned intermediate the mating surfaces of said connector body halves thereby maintaining said metallic elements in predetermined floating relationship relative to said connector body,

a plurality of angularly bent second electrical contact members extending through apertures in said mating halves so as to project through angularly disposed adjacent surfaces on said connector body, and,

fastening means connected to each of said body halves for locking the assembled connector body halves together.

2. A connector assembly as defined in claim 1 wherein the end of each of said angularly bent contact members extending through the angularly disposed adjacent surface of said connector body has a tail adapted to be inserted into a printed circuit board.

3. A connector assembly as defined in claim 1 wherein said angularly bent second electrical contact members each comprise elongate metallic elements, which extend through an angularly positioned stepped complementary surface on each of the mating halves of said connector body whereby assembly of said mating halves maintains said bent metallic contact elements in predetermined locked relationship relative to said connector body.

4. A connector assembly as defined in claim 3 wherein said angularly stepped surfaces on said mating connector body halves are normal to each other,

and said metallic contact elements are bent at 90° angles so as to perpendicularly project through said complementary surfaces.