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Simplified Connector for Male Type Terminations
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ABSTRACT OF THE DISCLOSURE
An elongated double female connector made in two halves joined together providing a longitudinal aperture, each half having alternately arranged takeoff apertures and laterally extended contact securing portions, the contact securing portions of one half cooperating with the takeoff aperture for retaining spring contacts in place. The spring contact members are arranged to permit an electrical input to be applied from either side of the longitudinal aperture.

The present invention relates to connector assemblies, and more particularly to double female connector assemblies.

In many circuit applications it is necessary to provide interconnections between a plurality of electrical conductors. The electrical conductors may form part of a printed circuit on a printed circuit board or may comprise the conductors of a flat flexible cable wherein a plurality of electrical conductors are sandwiched between two thin insulating layers. The type of connector assembly required for interconnection of such a plurality of conductors is that of a double female connector. That is, a connector assembly which may receive male contacts from either side and with a common connection therethrough. Thus, in many applications it is necessary to provide a convenient means to eyelot or rivet together or to insert a nut and bolt assembly, not shown, for securing the body members together. The inside surfaces 24 and 26 of the members 10 and 12 are recessed, with a longitudinal slot aperture 25 being formed between these inside surfaces. As better shown in Fig. 3, the aperture 25 extends across the width of the device from its front edge 29 to its back edge 31. The slot aperture extends also along the length of the connector assembly for a substantial portion of its length.

Extending downwardly from the top cover member 10 into the slot aperture 28 are a plurality of stud appendages 30. Extending upwardly from the inside surface 26 of the bottom cover member 12 into the aperture slot 28 are a plurality of stud appendages 32. Since the members 10 and 12 are inverted 180° with respect to each other, the appendages 30 and 32 alternate with one another across the length of the slot 28. The exact shape of the appendages 30 and 32 are better shown in Figs. 4 and 5 which will be discussed in more detail below.

On the outer surface 34 of the top of body member 10 and forming an integral part thereof is an upwardly extending takeoff portion 36. The bottom casing member 12 has a similar takeoff portion 38 which extends from the bottom outside surface 40. The raised takeoff portion 36 is divided into a plurality of wells 42. Each of the wells 42 has a takeoff aperture 44 extending therethrough through the inside surface 24 of the member 10 into the slot aperture 28. The bottom raised portion 38 has a plurality of wells 46 disposed across the length of this portion, with each well having a takeoff aperture 48 extending from the well through the member 12 to the inside surface 26 at the longitudinal aperture 28. The takeoff apertures 44 of the top cover member 10 are to be lined up with the stud appendages 32 of the bottom cover member 12. Conversely, the takeoff apertures 48 of the bottom body member 12 are disposed to line up with the stud appendages 30 of the top body member 10.

A plurality of electrical contacts 50, 52 are disposed in the longitudinal slot 28 and extend across the width of the assembly to provide points for electrical connection thereto at the side surfaces 29 and 31. The contact members 50 and 52 are substantially identical in shape and are adjacent to each other, but are inverted 180° with respect to each other.
Referring now to the sectional views of FIG. 4 and FIG. 5, the shape of the contacts 50 and 52 is better shown. With particular reference to FIG. 4, the contact member 50 is shown having a spring portion 54 which is designed to receive a male contact when inserted from the end 31 of the assembly into the aperture 28. Upon the insertion of such a male contact, the spring portion 54 will be compressed and with the reactive force established thereby, will establish a good contact to the male contact. From the spring portion 54, the contact extends along a flat portion 56 adjacent the inside surface 24 of the body member 10. The contact member 50 then takes a right angle turn and follows the contour of the stud appendage member 30 with the portion 58 abutting thereagainst. The bottom portion 60 of the stud 30 has a somewhat smaller cross section than the upper portion. The bottom portion 60 is so formed to fit into the takeoff aperture 48 and secure the contact 50 therein. As is shown the contact 50 has a takeoff portion 62 which is U-shaped and which fits within the aperture 48 and is held therein by the stud appendage 30 with its bottom portion 60 securing the contact 50 therein. The takeoff portion 62 is substantially U-shaped with top portions thereof 64 and 66 extending laterally to the right and left, respectively, so that the stud 30 may apply a downward pressure thereto. A substantially straight portion 68 of the contact is adjacent the side wall 29 within the slot aperture 28. The spring portion 70 will be compressed when a male contact is inserted therein to provide a good electrical contact therewith. Contact pressure is a combination of the bending of the two length members of the contact, such as both 68 and 70. The contact 52 seen in FIG. 5 is substantially identical to that of the contact 50 of FIG. 4 and the primed numerals indicate similar structural portions. Similarly the bottom portion 60’ of the stud 32 secures the contact 52 into place with the U-shaped portion 62’ being held in the takeoff aperture 44 of the body member 10.

An electrical connection is thus provided transversely across the assembly with the spring portions 54, 54’ and 54’ being provided alternately at the bottom and top outside surfaces of the body members 10 and 12. The takeoff portions 62 and 62’ are held in place by the stud portion of the opposite body member to secure the contacts within the assembly. There will thus be a circuit across the device for each of the contact members 59 and 52. However, the takeoff portions 62 and 62’ will appear alternately. That is, the U-shaped portion 62 will appear at the apertures 48 in the bottom body member 12, while the takeoff portion 62’ will appear at the apertures 44 in the top body member 10. The alternate disposition of the takeoff portions, will permit easy access to the various contacts so that the takeoff portions 62 or 62’ may be utilized as test points into which an electrical connection can be made or will permit easy circuit modification by the breaking of the takeoff portion or the insertion therein of other electrical component parts. The proper use of the support of the stud appendages 30 and 32 permits the easy securing of the alternately appearing U-shaped takeoff portions 60 and 62 on the opposite sides of the connector assembly.

Another feature that this design lends itself to is the use of polarized male plugs. FIGURE 3 is a cross section of the connector, and FIG. 2 shows the probe portion 34 into which polarizing protrusions may slide if at the proper entrance lip is cut away as at 33 and 33’ in FIG. 2 and 33 and 35 in FIG. 3.

Although the present invention has been described with a certain degree of particularity, it should be understood that the present disclosure has been made only by way of example and that numerous changes in the details of construction and fabrication and the combination and arrangement of parts and elements may be resorted to without departing from the scope and the spirit of the present invention.

I claim as my invention:

1. A double female connector assembly comprising, a pair of substantially similar body members with their inside surfaces thereof fitting together to form a longitudinal aperture therebetween, a plurality of contact securing appendages laterally spaced along said longitudinal aperture and extending from the inside surface of each of said body members toward the other of said body members, each of said body members including a plurality of takeoff apertures spaced longitudinally along the body members, a plurality of electrical contact members disposed within said longitudinal aperture, each of said contact members including a contacting receiving portion at each end thereof to permit an electrical input to be applied thereto from either side of said longitudinal aperture and a takeoff portion between said contact receiving portion, each of said takeoff portions fitting into the corresponding one of said takeoff apertures in said body members and being engaged by the corresponding one of said contact securing appendages to secure each of said contact members in place.

2. A double female connector assembly comprising, a pair of substantially similar body members with their corresponding inside surfaces thereof fitting together to form a longitudinal aperture therebetween extending transversely across a portion of the width of the assembly, a plurality of contact securing appendages laterally spaced along said longitudinal aperture and extending from the inside surface of each of said body members toward the other of said body members, each of said body members including a plurality of takeoff apertures spaced longitudinally along the body members, a plurality of electrical contact members spaced from each other within said longitudinal aperture, each of said contact members including a spring portion at each end thereof to permit an electrical input to be applied thereto from either side of said longitudinal aperture and a takeoff portion between said spring portions, each of said takeoff portions fitting into the corresponding one of said takeoff apertures in said body members and being engaged by the corresponding one of said contact securing studs to secure each of said contact members in place, and a portion of said takeoff portions appearing at the outside surfaces of said pair of body members so that external electrical connection can be made.

3. A double female connector assembly comprising, insulating body members having a longitudinal aperture extending transversely across a portion of the width of the assembly, a plurality of contact securing studs laterally spaced along said longitudinal aperture and extending from the inside surface of said body members, said body member including a plurality of takeoff apertures on the outside surface thereof spaced longitudinally along the body member and being disposed over a corresponding stud within said longitudinal aperture, a plurality of electrical contact members spaced from each other extending transversely across said pair of body members within said longitudinal aperture, each of said contact member including a spring portion at each end thereof to permit an electrical input to be applied thereto from either side of said longitudinal aperture and a U-shaped takeoff portion between said spring portions, each of said takeoff portions fitting into the corresponding of said takeoff apertures in said body members and being engaged by the corresponding one of said contact securing studs to secure each of said contact members in place with adjacent ones of said takeoff portions fitting into apertures in the opposite side of said body member, and a portion of said takeoff portions appearing at the outside surfaces of said body member so that external electrical connection can be made at this point to each of said contact members.
members from opposite sides of said body member to adjacent contact members.

4. A double female connector assembly comprising, a pair of substantially similar electrically insulating body members being substantially similar with the corresponding inside surfaces thereof fitting together to form a longitudinal aperture therebetween extending transversely across a portion of the width of the assembly, a plurality of contact securing studs laterally spaced along said longitudinal aperture and extending from the inside surface of each of said body members toward the other of said body members, each of said body members including a plurality of takeoff apertures spaced longitudinally along the body members, a plurality of electrical contact members spaced from each other and extending transversely across said pair of body members within said longitudinal aperture, each of said contact members including a spring portion at each end thereof to permit an electrical input to be applied thereto from either side of said longitudinal aperture and a U-shaped takeoff portion fitting into said spring portions of each of said takeoff portions fitting into the corresponding one of said takeoff apertures in said body members and being engaged by the corresponding one of said contact securing studs to secure each of said contact members in place.

5. A double female connector assembly comprising, a pair of electrically insulating body members being substantially similar with the corresponding inside surfaces thereof fitting together to form a longitudinal aperture therebetween extending transversely across a portion of the width of the assembly, a plurality of contact securing studs laterally spaced along said longitudinal aperture and extending from the inside surface of each of said body members toward the other of said body members, each of said body members including a plurality of takeoff apertures spaced longitudinally along the body members and being disposed over the corresponding stud from the other of said body members, a plurality of electrical contact members spaced from each other and extending transversely across said pair of body members within said longitudinal aperture, each of said contact members including a spring portion at each end thereof to permit an electrical input to be applied thereto from either side of said longitudinal aperture and a U-shaped takeoff portion between said spring portions, each of said takeoff portions fitting into said takeoff apertures in said body members and being engaged by the corresponding one of said contact securing studs to secure each of said contact members in place with adjacent ones of said takeoff portions fitting into apertures in the opposite one of said pair of body members, and a portion of said takeoff portions appearing at the outside surfaces of said pair of body members so that external electrical connection can be made at this point to each of said contact members from opposite sides of said body members to adjacent contact members.

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