United States Patent

[11] 3,596,234

[72] Inventors **Joseph A. Sapienza**
Norwood;
Robert J. Butler, Malden, both of, Mass.

[21] Appl No. 774,774
[22] Filed Nov. 12, 1968
[45] Patented July 27, 1971

[73] Assignee Connector Technology Corporation
North Billerica, Mass.

[54] **FEMALE CONTACT ASSEMBLIES**
2 Claims, 4 Drawing Figs.

[52] U.S. Cl. 339/214, 85/36, 339/217
[51] Int. Cl. H01r 9/00
[50] Field of Search 339/214, 217, 220, 198, 200, 207; 85/36, 8.8

[56] References Cited

UNITED STATES PATENTS

2,386,732	10/1945	Wohlhieter	85/36 X
2,577,319	12/1951	Feitl	85/36
2,765,450	10/1956	Richardson	339/217 (S)
3,336,570	8/1967	Tuchel	339/220

FOREIGN PATENTS

1,121,230	7/1968	Great Britain	85/8 (.8)

Primary Examiner—Marvin A. Champion
Assistant Examiner—Robert A. Hafer
Attorney—Abbott Spear

ABSTRACT: A female contact assembly is disclosed comprising a housing member having passages extending therethrough with each passage having a socket portion opening through one face of the housing member. Each female contact has a fork part at one end, a shank, and an intermediate portion and is inserted through a passage to bottom its fork in the socket portion thereof, the shank being then exposed on the other face as are barbs by which a retainer is caught to anchor the contact against any appreciable movement in a withdrawing direction.

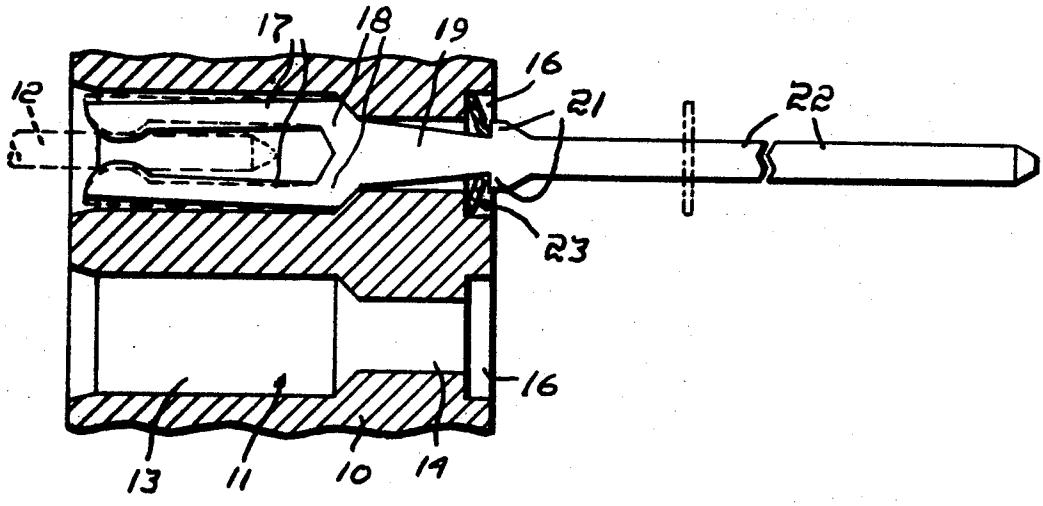


Fig. 1.

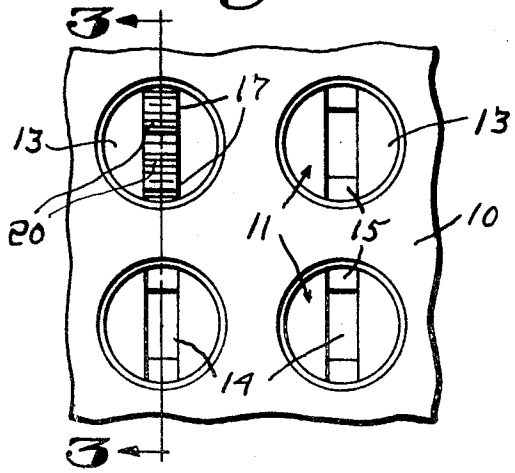


Fig. 2.

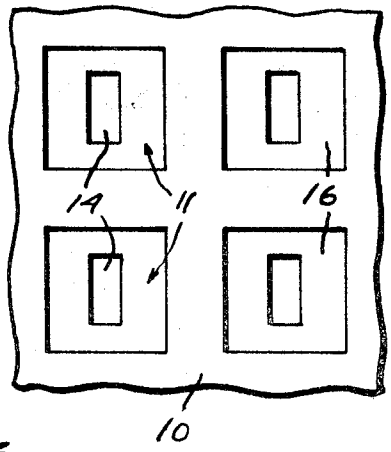


Fig. 3.

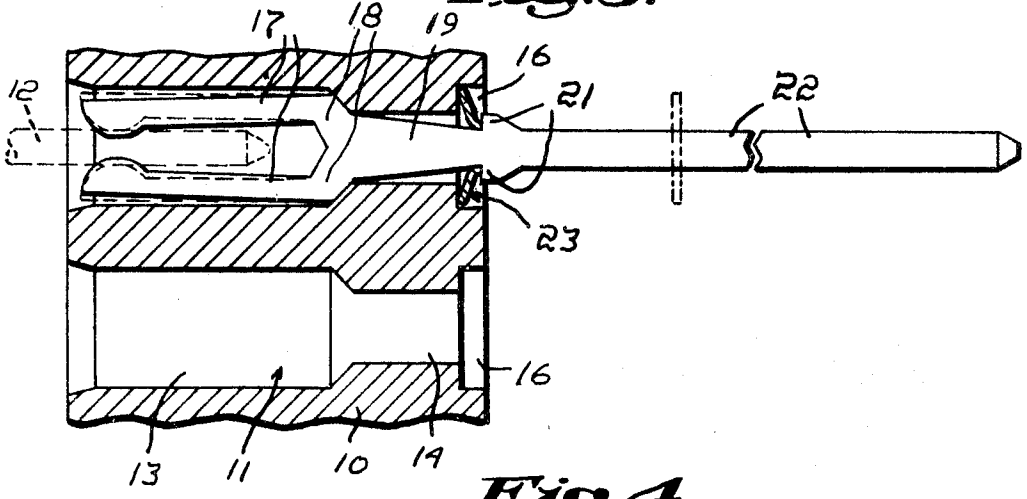
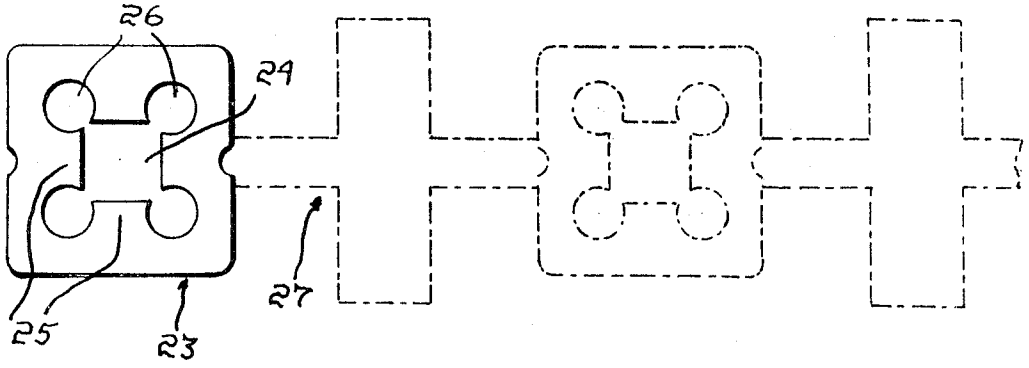


Fig. 4.



Inventors:
Joseph A. Sapienza,
Robert J. Butler,
by Abbott Spiro,
Attorney

FEMALE CONTACT ASSEMBLIES

The present invention relates to female contact assemblies such as are used to receive mating members.

In such assemblies, female contacts extend through passages in a housing member with each contact having a pair of portions at one end exposed on one side of the housing member to receive a mating member, a blade contact, for example, between them and its other end exposed as a shank on the opposite side of the housing member to have a lead secured thereto. Each housing member typically has a series of contact-receiving passages opening through opposite faces, each passage including a socket portion opening through one face and a slot portion opening through the other face and the bottom of the socket portion. Each female contact is of the type having a fork part at one end to receive a mating male contact and fitting freely and housed in the socket portion of the passage, a shank protruding from said other face, and an intermediate part within the slot portion of the passage, the shank and the intermediate part being dimensioned to be received by a slot portion and the intermediate part being of a cross sectional size and shape so that it is held against turning.

It is, of course, essential that the female contact and the blade contacts mate to provide good electrical connections. Problems exist in achieving that end not only during assembly but also in preventing the connections between the leads and the shanks of the contacts from being broken or weakened should it be necessary to unmate mated contacts for one reason or another.

The present invention has for its objective a female contact assembly that minimizes such generally indicated problems, an objective attained by providing each female contact with barbs at the junction of its intermediate portion with the shank to be exposed, when the contact is positioned in a passage, on the face of the housing member through which the slot portions open. A retainer is provided for each contact, each retainer having a central opening to accommodate the shank of a contact and a plurality of resiliently yieldable tabs bordering said opening and caught between the barbs and the proximate face of the housing member when forced over them thereby preventing any appreciable movement of the thus anchored contact in its passage. To ensure against any shank engaging the shank of an adjacent contact, the housing member is provided with recesses through each of which the slotted portion of a passage opens and which are shaped and dimensioned to receive and confine a retainer against any appreciable sidewise movement.

In the accompanying drawings, there is shown an embodiment of the invention illustrative of these and other of its objectives, novel features, and advantages.

In the drawings:

FIG. 1 is a fragmentary, top plan view of the housing member on a substantially increased scale showing the socket portions of the passages.

FIG. 2 is a like view but showing the slot portions of the passages,

FIG. 3 is a section taken approximately along the indicated lines 3–3 of FIG. 1, and

FIG. 4 is a plan view, on a further increase in scale, of a retainer before it is detached from a strip or sheet.

The female contact assembly shown in the drawings includes a flat surfaced housing member 10 that may be variously sized and shaped, but in any case, has a number of generally indicated passages 11 for mating members such as the blade contact indicated at 12 in FIG. 3. Each passage 11 has a socket portion 13 opening through one face of the member 10 and a slot portion 14 opening through the other face thereof and having an elongated diametrical mouth 15 opening through the bottom of the appropriate socket portion with its end portions tapering inwardly and downwardly. The member 10 is conventional except that it has square recesses 16 through each of which an appropriate one of the slot portions 14 opens.

Female contacts are provided for each passage 11 and one such is shown in the drawings and is of the type stamped from a sheet of metal that is a good electrical conductor and of a gauge such that the thickness of the contacts closely approximates the width of the slot portion 14 of the passages 11. The contact has a pair of arms 17 defining a fork part and inclined slightly towards each other with each arm including portions 18 inclined downwardly and inwardly to define a V internally of the fork part and provide inwardly tapering supporting shoulders at their junction with the intermediate part 19 for complemental engagement with the end portions of a mouth 15. At their free ends, the arms 17 have hemispherical projections 20, the projections being disposed towards each other to receive and frictionally engage a blade contact 12 inserted between them.

The female contact is also shown as having its intermediate part 19 provided with edge barbs 21 at its junction with the shank 22 which is square in cross section. The intermediate part, 19 tapers inwardly towards the barbs 21, the intermediate part, adjacent the fork part and the zone of the barbs 21 being of a cross-sectional size and shape closely approaching that of the slot portion 14 so as to be slidably received thereby with an inserted contact held against turning. The intermediate part just rearwardly of the barbs 21 is preferably of the same cross sectional size and shape as the shank 22.

Each contact is to be inserted into a passage 11 from its socket portion end, until its shoulders are seated in the end portions of the mouth 15, the fork part being dimensioned then to fit freely within the socket portion and to be housed therein. When the fork part is thus seated, the full length of the shank 22 is exposed for the connection thereto of a lead or leads and the barbs 21 are also exposed partly within a recess 16.

In order to prevent disturbance of such leads, if the unmating of the contacts is necessary, each contact is secured by a retainer generally indicated at 23 and shown in FIG. 4 as being approximately square and dimensioned to fit within a recess 16. The retainers 23 are formed from a sheet of material that is resiliently flexible and each has a central, square, opening 24 dimensioned to be a sliding fit on a shank 22 and bordered by tabs 25 formed by openings 26 so intersecting the corners of the opening 24 that the tabs 25 are of substantially the same width throughout their length.

When a retainer 23 is forced over the barbs 21 of a contact and into a recess 16, two opposite tabs 25 yield but spring back into engagement with the intermediate part 19 under the barbs and with the retainer itself being rendered somewhat concave and thus held seated in the recess 19. A contact, when thus locked to the housing 10, is prevented from so moving lengthwise of its passage 11 as to risk the breaking or weakening of the connection of any lead connected to its shank. It will be noted that each shank 22 is of substantial length and hence any looseness of the fit of the intermediate part 19 of a contact in a slot portion 14 enables a contact to be tilted or rocked slightly. Because the intermediate part 19 is tapered to form the barbs 21, the chances that such contact tilting or rocking would result in one shank engaging another would be greatly increased were it not for the fact that each retainer 23 is dimensioned to be a sufficiently close fit in a recess 19 to prevent any appreciable side-to-side movement.

It will be appreciated that the retainers 23 are of such small size that they would be difficult to handle individually and, for that reason, they are provided in strips or sheets with the retainers 23 interconnected by readily broken links 27.

From the foregoing, it will be appreciated that assemblies in accordance with the invention are well adapted to meet a wide range of requirements since the contacts may be easily and quickly inserted in the passages of the housing member 10 and anchored thereto against objectionable endwise or sidewise movements.

We claim:

1. A female contact assembly to receive the connectors of a printed circuit component, said assembly comprising a housing member having a series of passages opening through opposite faces, each passage including a socket portion opening through one face and a slot portion opening through the other face and the bottom of the socket portion, contacts for the passages of thin flat stock, each contact including a fork part to receive a connection fitting freely and housed in the socket portion of a passage, a shank protruding from said other face, and an intermediate part extending through the slot portion of that passage, the shank being dimensioned to be received by the slot portion and held thereby against turning, and said intermediate part including barbs at its junction with the shank and exposed on said other face, said other face having recesses through each of which a appropriate one of the slot portions opens, and a thin flat retainer for each contact, each retainer

being dimensioned to fit a recess and including a plurality of tabs whose proximate edges define an opening for the shank of a contact and which are resiliently yieldable thus to be first temporarily upset by and then spring back into a position to be caught behind said barbs against retraction as a retainer fitted on a shank is seated in the appropriate recess.

2. The assembly of claim 1 in which the shank of each contact is substantially square in cross section, each recess is square, and each retainer is of the same size and shape as the recesses and has four tabs, each having a straight edge disposed at right angles to adjacent tab edges whereby with a retainer slipped on a shank in a position to fit the appropriate recess, two transversely aligned tabs are positioned to engage with and be upset by the barbs.