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54 Telephone connector with bypass capacitor.

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Description

This invention relates to a modular telephone jack including an insulating body member formed with an opening for a mating connector, and a plurality of electrical contacts mounted in said body member.

Electrical jacks such as the one described in US-A-4,205,891 are provided with a number of electrical contacts which make mating engagement with a male contact which is received therein. Such a jack does already provide capacitors to a ground plane from all of the various contacts. The construction of these jacks, however, is not applicable to standard modular telephone jacks which are provided with a number of flexible electrical contacts such as described in US-A-4,195,900. In these jacks a certain flexibility of the electrical contacts is necessary, and this flexibility causes problems in the mounting of the capacitors.

It is an object of the present invention to provide end mounted ceramic capacitors which extend between the contacts and a ground plane of the jack.

It is a further object of the present invention to provide a telephone female terminal in which the various contactors of the terminal are provided with an enlarged portion upon which are mounted monolithic surface mounted capacitors which extend to a ground plane which is connected to a ground plane of a printed circuit board or to another suitable grounding region.

Metal springs are provided which engage the ends of the capacitors which provide for mechanical cushioning of the capacitors and for alignment.

Other objects, features and advantages of the invention will be readily apparent from the following description of certain preferred embodiments thereof taken in conjunction with the accompanying drawings, although variations and modifications may be effected without departing from the spirit and scope of the novel concept of the disclosure and in which:

ON THE DRAWINGS

FIG. 1 is a front plan view of the novel connector of this invention;

FIG. 2 is a sectional view taken on line II-II from FIG. 1;

FIG. 3 is a top plane view of the invention with portions removed;

FIG. 4 is a cut-away top view of the invention;

FIG. 5 is a partial view illustrating the connector prongs and contacts;

FIG. 6 illustrates a modification of the invention;

FIG. 7 is a sectional view taken on line VII-VII from FIG. 6;

FIG. 8 is a top plan view with portions removed; and

FIG. 9 is a break-away top view of the invention.

FIGS. 1-5 illustrate a first embodiment of the invention which comprises a terminal 10 formed with a plastic body member 11 in which a jack receiving hole 23 is formed in a front face thereof. The plastic member as shown in the sectional view of FIG. 2 has a bottom member 13 and a top member 21 and a back portion 22. A plurality of electrical contact members 14a through 14f have first portions which extend into the opening 23 so as to make electrical contact with mating terminals on a male plug received in the opening 23 and have top portions 17a which pass over the top 21 of the plastic member 11 and are formed with enlarged capacitor contacts 18a through 18f in the top portions 17a through 17f of the contact which are offset relative to each other as illustrated in FIG. 3. The rear portions of the contacts 14a through 14f pass down beyond the rear portion 22 of the plastic member 11 and extend through the bottom portion 13 of the plastic member 11 and through a printed circuit board 49 which is provided with printed circuit contact area 51 to make electrical contact with the ends 18a through 18f of the contacts 14a through 14f as illustrated in FIGS. 1 and 2, for example.

Mounting prongs 47 and 48 pass through aligned openings in the printed circuit board 49 for mounting the female contact 10 on the board 49. A plurality of end mounted capacitors 26a through 26f extend through an insulating sheet 27 which has a rear portion 28 which is mounted relative to the plastic housing 11 such that first ends of the capacitors 26a through 26f engage the electrical contact regions 18a through 18f of the electrical contacts 14a through 14f.

A planar member 19 is formed with downwardly bent fingers such as 31 and 32 illustrated in FIGS. 2 and 4 which engage the second ends of the tombstone capacitors 26a through 26f and the member 19 is electrically connected to a conductive cover 36. A downwardly extending portion 20 of cover 36 is mounted between downwardly extending portion 28 of the insulating member 27 and the rear 38 of the electrical conducting cover member 36. The member 19 may be soldered to the cover member 36 by providing solder through holes 37 formed in the planar member 19 as illustrated in FIG. 4.

The cover member 36 is formed with sides 39 and 41 and grounding tabs 42 and 43 which extend from the cover member 36 through openings formed in the printed circuit board 49 and make electrical contact with grounding regions on the printed circuit 51 so as to ground the upper ends of the capacitors 26a through 26f through the fingers 31 and 32, the finger member 19 and the cover

member 36.

In use, the terminal 10 is mounted on a printed circuit board 49 with contacts 16a through 16f which extend through board 49 electrically connected to different terminals on the printed circuit paths 51. The other ends of the capacitors 26a through 26f are grounded through the grounding tabs 42 and 43 which are connected to the side walls 39 and 41 of the electrically conducting cover member 36. The male member of the connector is inserted into the opening 23 to make electrical connection between the terminals 14a through 14f and such contacts are grounded through capacitors 26a through 26f. As illustrated in FIG. 5, the cover member side walls 39 and 41 are provided with tabs 46 which are deflected into mating opening formed in the plastic member 11 to firmly attach the cover member 36 to the plastic body member 11.

FIGS. 6-9 illustrate a second embodiment of the invention wherein grounding is made to a front grounding plate rather than to the printed circuit board 49.

FIGS. 6-9 illustrate a modification of the invention wherein the grounding arrangement has been changed. This merely requires the modification of the cover member and the plastic body member. In this embodiment, the cover member 136 has a front portion 152 which is connected to a conductive planar member 151 by solder 153. The plastic member 111 has a front rim 154 behind which the electrical conductive planar member 151 fits as shown in FIGS. 7, 8 and 9. The terminals 14a through 14f, the insulating plate 27, the capacitors 26 have the same configuration as that of the first embodiment. The cover member 136 is modified so as to eliminate the extension tabs 42 and 43 which are used for grounding in the embodiment illustrated in FIGS. 1-5 and grounding occurs through the plate 151 which is connected by the solder 153 to cover member 136. This embodiment allows mounting and grounding to conductive back panel.

Although the invention has been shown with six electrical terminals, it is to be realized that it may be modified to any desired number such as 8 or 10, for example. Item 12 of FIG. 3 (flangeless) could be modified as item 154 of FIG. 8 (flanged) with or without 151 conductive mounting member.

Claims

1. A modular telephone jack including an insulating body member (11) formed with an opening for a mating connector, a plurality of electrical contacts (14a-f) mounted in said body member (11), characterized by a plurality of surface mounted tombstone capacitors (26a-f) with first ends in contact, respectively, with electrical contact regions (18a-f) of the plurality of elec-

trical contacts (14a-f); an electrically conducting planar member (19) mounted to said body member (11) and formed with a plurality of flexible fingers (31, 32), respectively, engaging the second ends of the plurality of tombstone capacitors (26a-f); and means, comprising a cover member (36), sides (39, 41) and grounding tabs (42,43) for grounding said electrically conducting planar member (19).

2. A telephone jack according to claim 1 wherein said plurality of tombstone capacitors (26a-f) are mounted so that their longitudinal axes extend parallel to each other.
3. A telephone jack according to claim 2 wherein said electrically conducting planar member (19) is soldered to said electrically conducting cover member (36).
4. A telephone jack according to claim 2 including an electrically insulating member (27) formed with a plurality of holes in which said plurality of tombstone capacitors (26a-f) are respectively mounted and said insulating member (27) mounted between said cover member (36) and said plurality of electrical contacts (18a-f).
5. A telephone jack according to claim 4 including a printed circuit board (49) formed with at least one mounting opening, and said body member (11) formed with at least one mounting prong (47) which is receivable through said mounting opening to attach said telephone jack to said printed circuit board (49) and said plurality of electrical contacts (16a-f) to circuit paths on said printed circuit board (49).
6. A telephone jack according to claim 2, wherein said plurality of electrical contacts (14a-f) are formed with enlarged regions (18a-f) and said first ends of said plurality of tombstone capacitors (26a-f), respectively, engaging said enlarged regions (18a-f).
7. A telephone jack according to claim 5 including a conductive grounding area formed on said printed circuit board (49) and at least one electrically conducting tab (42) extending between said conductive grounding area and said electrically conducting cover member (36).

Revendications

1. Jack téléphonique modulaire comprenant un élément de boîtier isolant (11) formé avec une ouverture pour recevoir un connecteur complé-

- mentaire, une pluralité de contacts électriques (14a-f) montés dans ledit élément de boîtier (11), caractérisé par un ensemble de condensateurs plats (26a-f) montés en surface avec leurs premières extrémités en contact, respectivement, avec des régions de contact électrique (18a-f) de la pluralité de contacts électriques (14a-f) ; un élément plan électriquement conducteur (19) monté sur ledit élément de boîtier (11) et formé avec une pluralité de doigts flexibles (31, 32) venant respectivement en prise avec les secondes extrémités de la pluralité des condensateurs (26a-f) ; et des moyens comprenant un élément de boîtier (36), des côtés (39, 41) et des languettes de mise à la masse (42, 43) pour mettre à la masse ledit élément plan électriquement conducteur (19).
2. Jack téléphonique selon la revendication 1, dans lequel ladite pluralité de condensateurs plats (26a-f) sont montés de manière que leurs axes longitudinaux soient parallèles entre eux.
 3. Jack téléphonique selon la revendication 2, dans lequel ledit élément plan électriquement conducteur (19) est soudé audit élément de couvercle électriquement conducteur (36).
 4. Jack téléphonique selon la revendication 2, comprenant un élément électriquement isolant (27) formé avec une pluralité d'orifices dans lesquels ladite pluralité de condensateurs plats (26a-f) est respectivement montée et en ce que ledit élément isolant (27) est monté entre ledit élément de couvercle (36) et ladite pluralité de contacts électriques (18a-f).
 5. Jack téléphonique selon la revendication 4, comprenant une carte de circuit imprimé (49) formée avec au moins un orifice de montage, et caractérisé en ce que ledit élément de boîtier (11) est formé avec au moins un crochet de montage (47) qui peut pénétrer à travers ladite ouverture de montage pour fixer ledit jack téléphonique à ladite carte de circuit imprimé (49) et ladite pluralité de contacts électriques (16a-f) sur les pistes des circuits de ladite carte de circuit imprimé (49).
 6. Jack téléphonique selon la revendication 2, dans lequel ladite pluralité de contacts électriques (14a-f) comportent des régions élargies (18a-f) et caractérisé en ce que les premières extrémités de ladite pluralité des condensateurs plats (26a-f), vient respectivement en prise avec lesdites régions élargies (18a-f).
 7. Jack téléphonique selon la revendication 5, comprenant une surface conductrice de mise à la masse formée sur ladite carte de circuit imprimé (49) et au moins une languette électriquement conductrice (42) s'étendant entre ladite surface conductrice de mise à la masse et ledit élément de couvercle électrique non conducteur (36).

Patentansprüche

1. Modulare Telefonkline, mit einem Isolierenden Körperteil (11) mit einer Öffnung für einen passenden Verbinder, wobei mehrere elektrische Kontakte (14a-f) in dem Körperteil (11) angebracht sind, gekennzeichnet durch mehrere oberflächenmontierte monolithische Kondensatoren (26a-f), deren erste Enden jeweils in Kontakt mit elektrischen Kontaktbereichen (18a-f) der Mehrzahl elektrischer Kontakte (14a-f) stehen; ein elektrisch leitendes Planes Teil (19), das an dem Körperteil (11) angebracht und mit mehreren flexiblen Fingern (31, 32) versehen ist, die jeweils mit den zweiten Enden der Mehrzahl monolithischer Kondensatoren (26a-f) in Eingriff stehen; und eine Einrichtung mit einem Abdeckteil (36), Seiten (39, 41) und Erdungszungen (42, 43) zum Erden des elektrisch leitenden planen Teils (19).
2. Telefonkline nach Anspruch 1, wobei die Mehrzahl monolithischer Kondensatoren (26a-f) so angebracht ist, daß deren Längsachsen sich parallel zueinander erstrecken.
3. Telefonkline nach Anspruch 2, wobei das elektrisch leitende plane Teil (19) an dem elektrisch leitenden Abdeckteil (36) angelötet ist.
4. Telefonkline nach Anspruch 2, mit einem elektrisch isolierenden Teil (27) mit mehreren Durchgangsöffnungen, in denen die mehreren monolithischen Kondensatoren (26a-f) jeweils angebracht sind, wobei das Isolierende Teil (27) zwischen dem Abdeckteil (36) und den mehreren elektrischen Kontakten (18a-f) angebracht ist.
5. Telefonkline nach Anspruch 4, mit einer gedruckten Schaltungskarte (49) mit mindestens einer Montieröffnung, wobei das Körperteil (11) mit mindestens einem Anbringungszinken (47) versehen ist, der durch die Anbringungsöffnung aufnehmbar ist, um die Telefonkline an der gedruckten Schaltungskarte (49) und die mehreren elektrischen Kontakte (16a-f) an den Leitungspfad auf der gedruckten Schaltungskarte (49) anzubringen.

6. Telefonklinge nach Anspruch 2, wobei die mehreren elektrischen Kontakte (14a-f) mit vergrößerten Bereichen (18a-f) versehen sind und die ersten Enden der mehreren monolithischen Kondensatoren (28a-f) jeweils mit den vergrößerten Bereichen (18a-f) in Eingriff stehen. 5
7. Telefonklinge nach Anspruch 5, mit einem leitenden Erdungsbereich auf der gedruckten Schaltungskarte (49) und mindestens einer elektrisch leitenden Zunge (42), die sich zwischen dem leitenden Erdungsbereich und dem elektrisch leitenden Abdeckteil (36) erstreckt. 10

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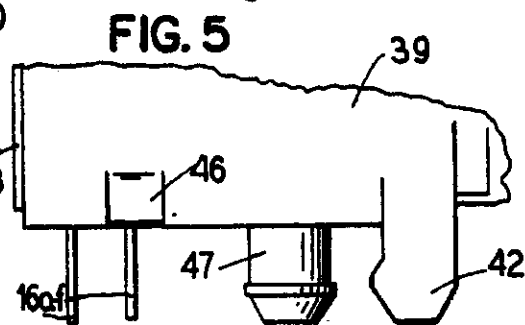
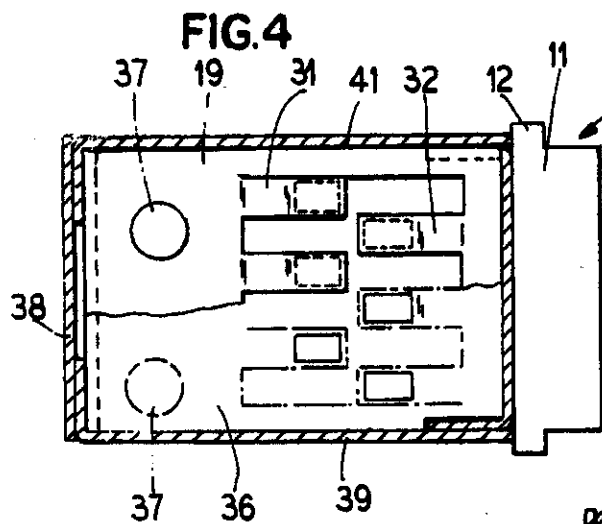
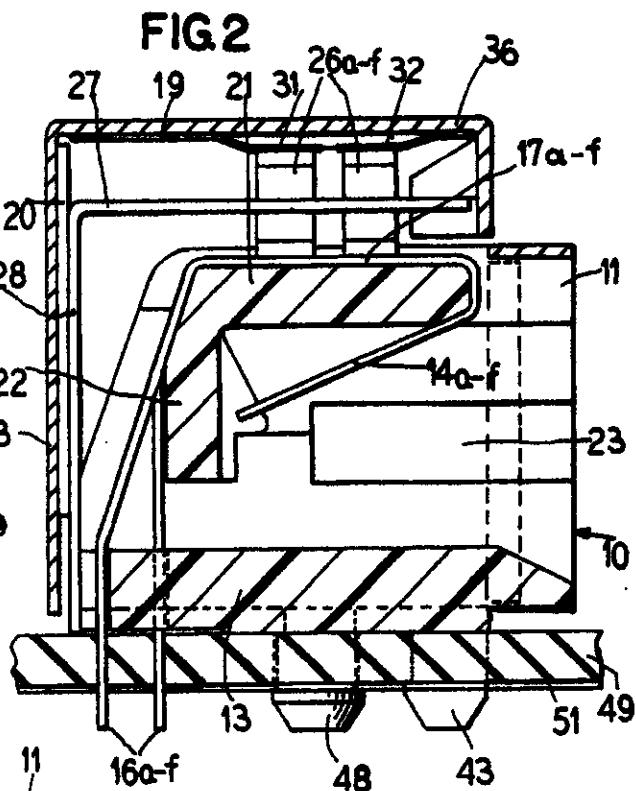
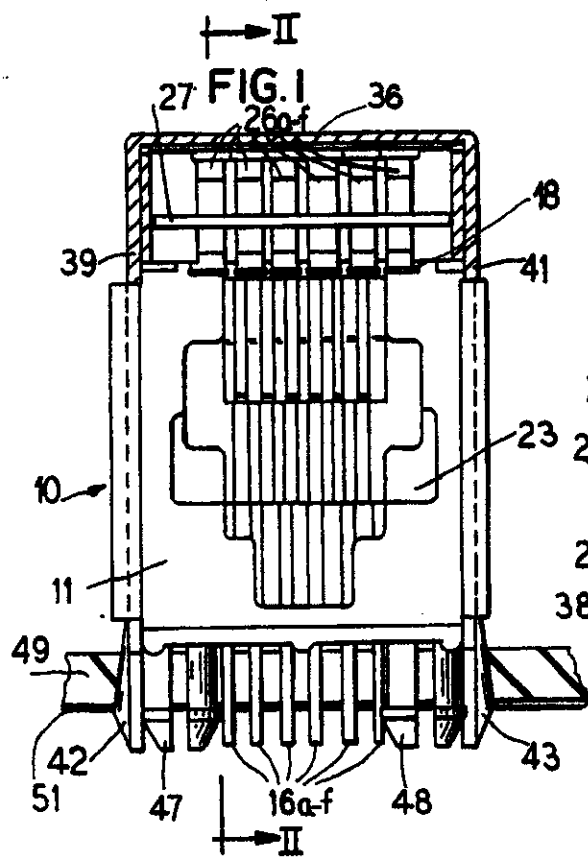
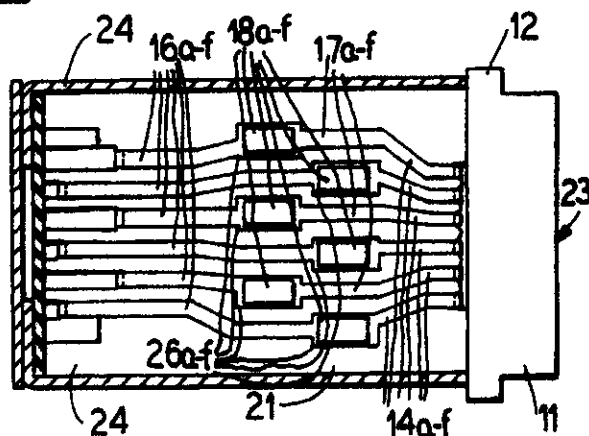
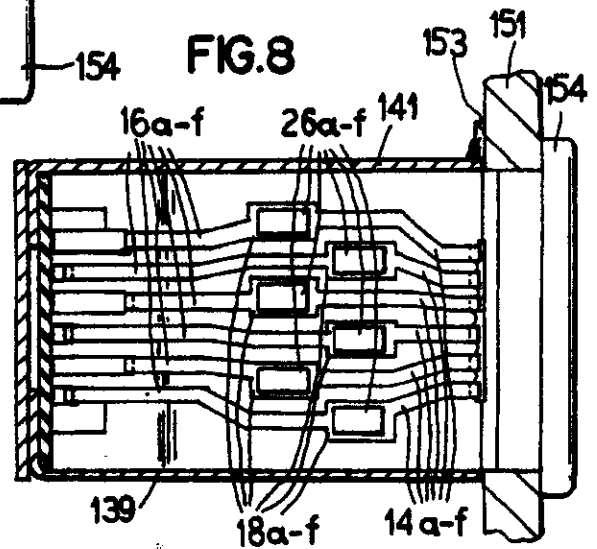
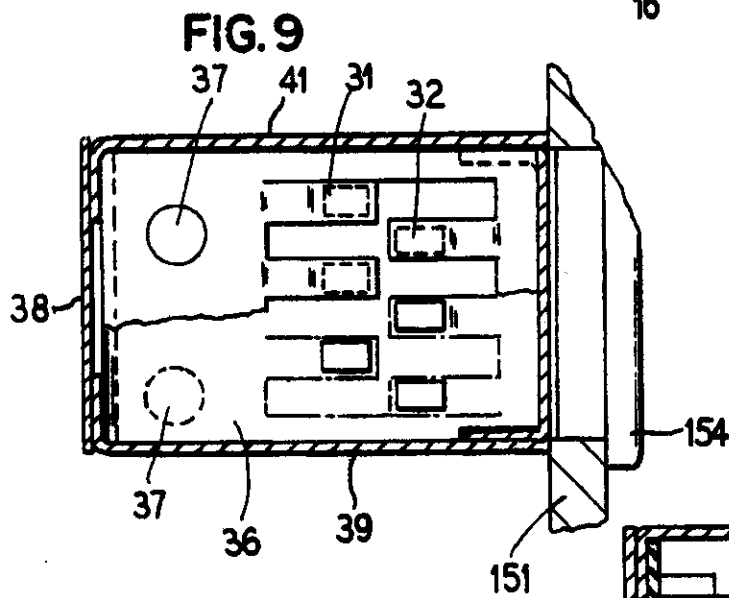
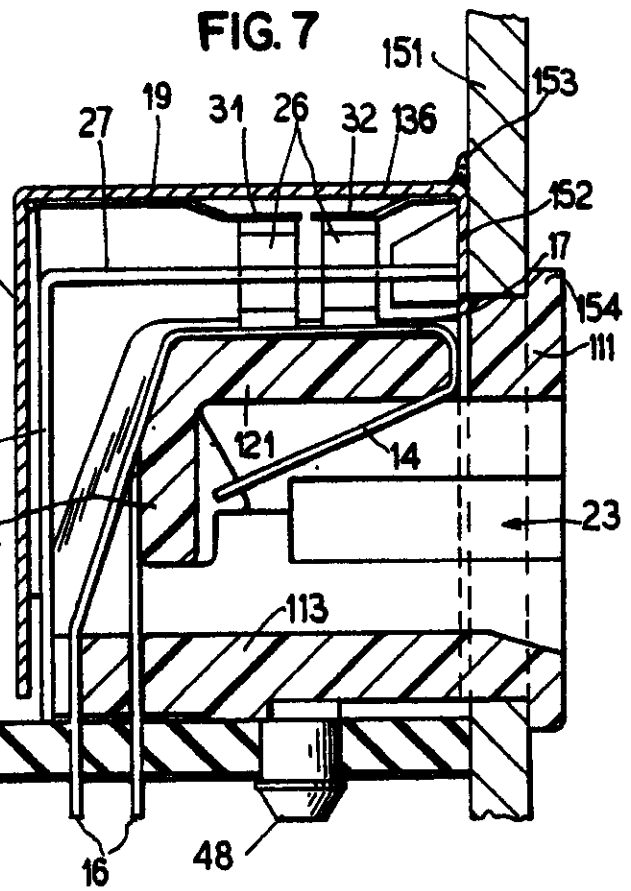
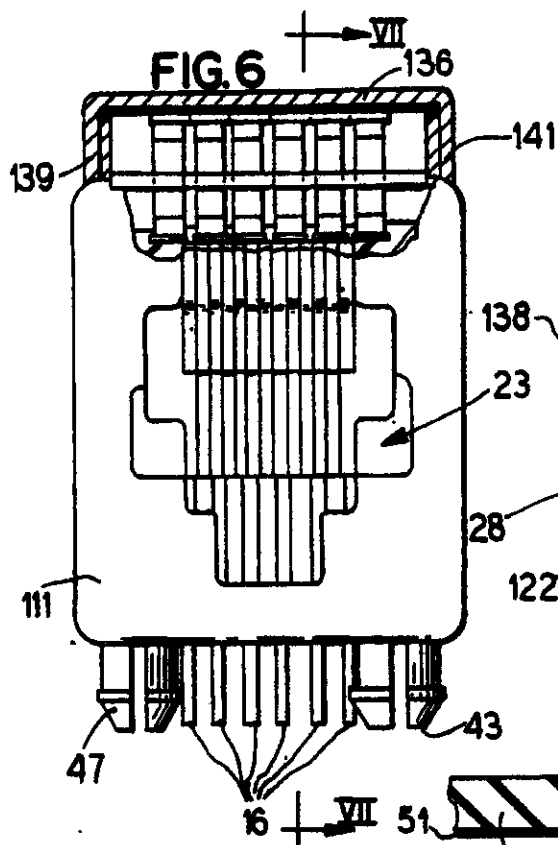


FIG. 3





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