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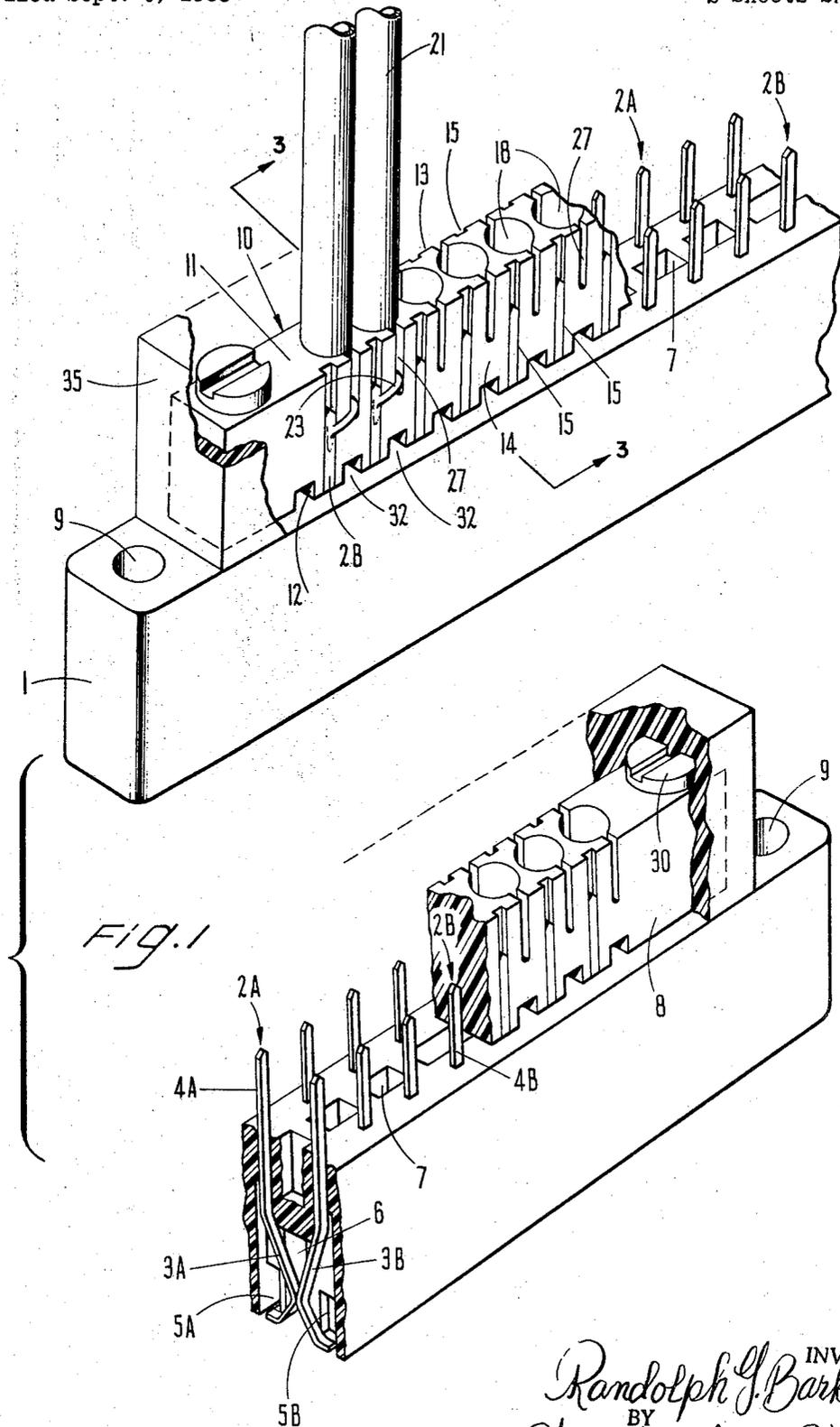
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LEAD ISOLATOR

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2 Sheets-Sheet 1



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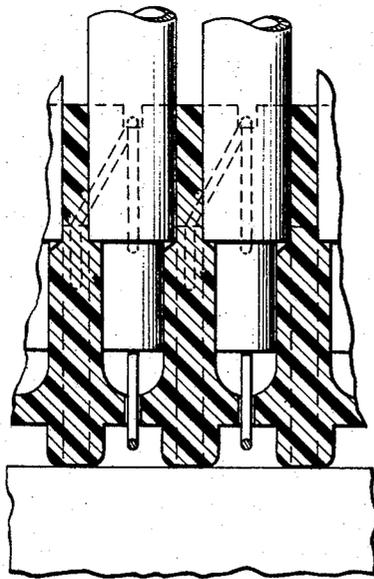
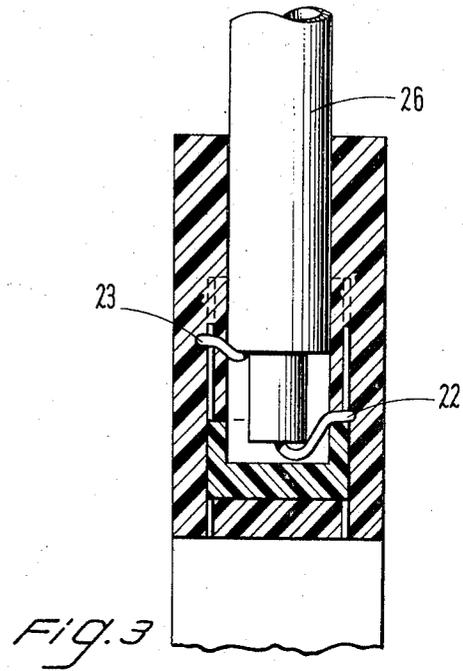
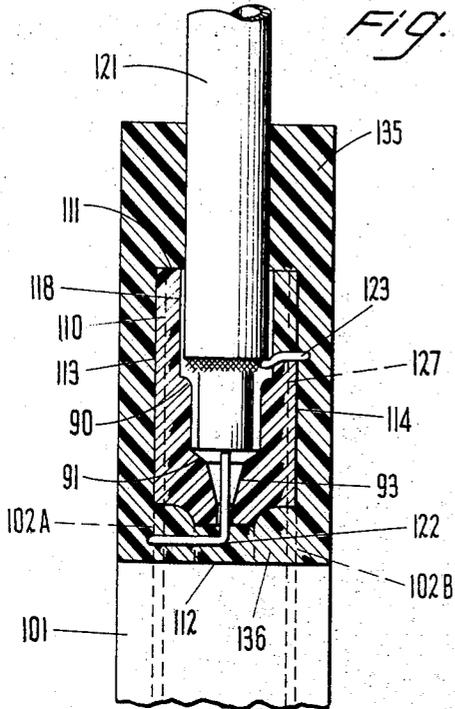
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2 Sheets-Sheet 2



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**LEAD ISOLATOR**

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16 Claims

**ABSTRACT OF THE DISCLOSURE**

A printed circuit connector for connecting a plurality of coaxial cables to a printed circuit. The connector has a connector base supporting a series of contact pairs arranged with the pairs of successive contacts in two parallel rows. Each contact has a tab with the tabs arranged in two rows. A lead isolator extends longitudinally of and between the two rows of tabs and has a series of holes extending through it. A coaxial cable is in each hole with the leads of the cable isolated from each other. These leads of each cable are connected to a different one of a given pair of tabs. A molded casing is lock-molded about the lead isolator leads and connector base.

**SUBJECT MATTER OF THE INVENTION**

The present invention relates to an electrical connector and, in particular, to a connector that is adapted to connect a plurality of coaxial electrical cables to a terminal, such as a printed circuit terminal.

**BACKGROUND OF THE INVENTION**

Printed circuits, especially those used in computer apparatus, are frequently designed for use with coaxial cables of comparably fragile design. For that reason and others, there is a need for an improved connector to which these fragile and exotic cables may be connected simply and without the likelihood of shorting or breaks within the connector.

**SUMMARY OF THE INVENTION**

It is therefore an object of the present invention to provide an improved connector designed especially for use in connecting a plurality of coaxial cables to a mating terminal. A further object of the present invention is to provide an improved, printed circuit connector especially useful in telephone and computer circuitry. A further object of the present invention is to provide an improved means of terminating a plurality of fragile coaxial cables in aligned relation and in such a manner as to minimize the likelihood of damage to the connection of the cable leads which might result from application of inadvertent forces. A further object of the present invention is to provide an improved printed circuit connector that can withstand substantial abuse and handling without the likelihood of broken connections or shorts. In this connection, the present invention provides an effective means for isolating the ground wire from the center wire of a coaxial cable, and further isolates each coaxial cable from adjacent coaxial cables. The present invention also provides means by which a printed circuit connector can be assembled together with coaxial cables in a permanent assembly rapidly and inexpensively and in a manner which is not likely to cause subsequent defective operation of the circuit in which the connector is used. A further object of the present invention is to provide an improved connector which may be used for a wide variety of different circuits and assemblies, and which is susceptible of incorporation in relatively small circuits.

In the present invention, there is provided a connector

2

for an array of coaxial cables comprising a connector having a plurality of pairs of connective tabs arranged with one tab of each pair in a different one of two rows. An elongated, dielectric lead isolator extends lengthwise of and intermediate the rows one from the other. The lead isolator has a plurality of recesses or holes each adapted to receive the end of a coaxial cable and provides means for electrically connecting one lead of each coaxial cable to one tab of a pair and the other lead thereof to the other tab of the same pair.

**BRIEF DESCRIPTION OF THE DRAWINGS**

The foregoing objects and advantages of the present invention will be more clearly understood when considered in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective, partially fragmented illustration of a printed circuit connector embodying the present invention;

FIG. 2 is a fragmentary elevation in partial cross-section of the side of the finished connector of FIG. 1 which is hidden;

FIG. 3 is a cross-sectional detail taken along the line 3-3 of FIG. 1; and

FIG. 4 is a cross-sectional detail of a modification taken substantially along the same line of the connector as FIG. 3 is taken.

**DESCRIPTION OF THE PREFERRED EMBODIMENTS**

The connector illustrated in the drawings is designed primarily for use as a printed circuit connector for connecting a plurality of coaxial cables to a printed circuit of a computer. However, the principles disclosed and claimed may be used in other styles of connectors where it is desirable to isolate the leads of coaxial cables and to provide improved means for attaching these leads to the connector.

Referring first to the embodiment illustrated in FIGS. 1 to 3, there is shown a connector base 1 which may be formed of any suitable, molded material ordinarily used for making dielectric bodies of an electrical connector. This material may, for example, comprise a diallylphthalate plastic. This connector base is of conventional design in arrangement. Within the connector base 1 are a series of conductor pairs 2a and 2b, which are preferably arranged in two parallel rows spaced apart one from the other. The conductor pairs 2a and 2b are each formed with conventional contacts 3a and 3b at one end and integrally formed tabs 4a and 4b at the other end. The contacts may be of any suitable, conventional design and may, for example, comprise cantilevered, bifurcated, resilient contacts that are adapted to engage insulated contacts of a mating component on a circuit board or the like. The conductors 2a and 2b may be suitably molded within conventional recesses in the conductor base 1, with the contacts 3a and 3b arranged in recesses 5a and 5b on opposite sides of a longitudinally extending slot 6.

Preferably, a series of holes 7 extends downwardly from the upper surface 8 of the contact base intermediate the tabs 4a and 4b. The length of these holes 7 may vary with the holes being provided at least in part to permit a better engagement with the plastic cover which is molded over the tabs 4a and 4b.

Holes 9 extend through the connector base 1 to provide a means for aligning the connector base with locating pins or the like. A lead isolator 10 extends longitudinally of the connector base and is secured over and to the surface 8 of this connector base between the rows of tabs 4a and 4b. This lead isolator may be made of any suitable molded dielectric material including, for example, diallylphthalate plastic. Preferably, the lead isolator should be

molded of a transparent material to make assembly and welding of the individual coaxial leads to the rows of tabs 4a, 4b easier. The lead isolator has generally an elongated, rectangular configuration providing a top wall 11, bottom wall 12 and opposite side walls 13 and 14. Each of the side walls 13 and 14 are provided with a series of slots 15 parallel to one another that extend from the bottom wall 12 to the top wall 11. These slots 15 have a width and depth and are spaced apart to receive successively the tabs 4b within the slots 15 on side wall 14, and the tabs 4a within the slots 15 on side wall 13.

A series of holes 18 extend parallel to one another from the top wall 11 through the bottom wall 12. These holes 18 are each located with their axes intermediate adjacent pairs of tabs. Holes 18 have a diameter sufficient to receive the full diameter of the coaxial cables being connected to the connector and extend toward but short of the bottom wall 12. Each of the walls 13 and 14 are formed with slots 27 that extend from the holes 18 to the outer wall. The slots are parallel to and intermediate slots 15, and extend approximately halfway from top wall bottom wall 12. The cables 21 are inserted in parallel into the holes 18 in longitudinal array with the conductive leads 22 and 23 exposed. The center lead 22 of each cable 21, is passed from hole 18 and is bent outwardly and angularly through a slot 27 into electrical contact with one of the tabs 4a to which it is suitably welded. The drain lead 23 is bent angularly from the outer insulating cover 26 of the coaxial cable at a distance spaced from the point at which the lead 22 is exposed. The lead 23 extends angularly through a slot 27 in the opposite wall 14 of the isolator and is electrically connected or soldered to the tab 4b, corresponding to the tab 4a to which the center lead 22 of the same coaxial cable is connected.

The ends of the lead isolator are provided with holes through which screws 30 extend to lock the lead isolator to the connector base 1. The lead isolator is also provided with a series of parallel recesses or slots 32 intermediate slots 15 extending from wall 13 to wall 14 in the bottom wall 12. The slots 32 allow the cover molding to flow under the lead insulator and thereby prevents it from lifting away from the connector in the finished product. The cover 35 is made of a suitable molding material, preferably vinyl. This cover 35 has side walls which are parallel and no further apart than the side walls of the connector base. The cover molding 35 extends about the parallel cables 21 with portions of the molding extending into the slot 32 to form an integral unit.

In the embodiment illustrated in FIG. 4, parts not specifically described may be similar in construction to corresponding components of the embodiments of FIGS. 1 to 3. In this arrangement, the elongated lead isolator 110 is formed with a series of through holes 118 that extend from the top wall 111 of the lead isolator to the bottom wall 112. The holes 118 are each formed with shoulder sections 90 and 91 which successively reduce the size of the hole from a diameter sufficient to receive the full diameter of the coaxial cable 121 at the upper end of the lead isolator, to a diameter intermediate the top and bottom walls 111 and 112 of the lead isolator such as to receive only the diameter of the inner insulation of the cable in an intermediate segment, and a lower tapered segment 93 adapted only to receive the center lead 122 of the coaxial cable. The center lead 122 of the coaxial cable extends through the bottom wall 112 and outwardly toward a tab 102a to which it is soldered. A series of slots 127 are formed in side 114 of the lead isolator and extend from the top wall 111 partially toward the bottom wall 112. The slots each interconnect the outer surface of wall 114 with a hole 118. Parallel slots are formed in the surface 114 to receive the tabs 102b. The other wall 113 of the lead isolator is smooth except for parallel slots adapted to receive the tabs 102a. The drain lead 123 of each cable extends through a slot 127 and is soldered

or otherwise connected to tab 102b. A vinyl covering 135 is integrally molded about the coaxial cables 121 in facing engagement with the connector base 101 to which it is secured by portions of the covering 135 which extend into undercut portions 136.

What is claimed is:

1. A connector for multiple-cable connection comprising a connector base, a plurality of conductors having each a pair of conductive tabs arranged in said connector base with one tab of each pair in a different one of two rows, an elongated dielectric lead isolator extending lengthwise of and intermediate said rows isolating said rows one from the other said lead isolator including sides having means dielectrically engaging said rows, said lead isolator having a plurality of holes having means for receiving individually the ends of coaxial cables and providing means for electrically connecting one lead of said coaxial cable to one tab of a pair, and means defining a passage for receiving the other lead thereof for connection to the other tab of said pair.

2. A connector as set forth in claim 1 including an insulating cover extending over and integrally engaging said lead isolator.

3. A connector as set forth in claim 2 wherein said means for electrically connecting one lead of said coaxial cable to one tab of a pair, and the other lead thereof to the other tab of said pair comprises means forming a passage from one of said holes outwardly of said lead isolator to one side thereof and means forming a second passage from said one hole outwardly to a second side of said lead isolator with two leads of said coaxial cable extending respectively one through each of said passages into electrical connection with different ones of said tabs of a pair of tabs.

4. A connector as set forth in claim 3 wherein said lead isolator is formed with one of said passages extending over one side and the other of said passages extending over an opposite side of said lead isolator.

5. A connector as set forth in claim 3 wherein said connector base comprises an elongated member of dielectric material with said conductive tabs extending from one elongated side thereof in two parallel rows, said conductors each having a contact with said contacts arranged in two parallel spaced rows on a second elongated side of said connector base.

6. A connector as set forth in claim 5 wherein said lead isolator is positioned intermediate said two rows of tabs adjacent said one elongated side, means forming undercuts on one side of said lead isolator facing said connector base and said insulating cover having integrally formed portions extending into said undercuts.

7. A connector as set forth in claim 5 with said lead isolator having a plurality of parallel slots within which said tabs are located.

8. A connector as set forth in claim 7 including means for locking said lead isolator to said connector base.

9. A connector as set forth in claim 8 wherein said means forming passages includes slots in said lead isolator extending from said holes through one side of said lead isolator.

10. A connector as set forth in claim 9 wherein said means forming passages includes holes in said lead isolator each of narrower diameter and continuous with one of said holes for receiving said coaxial cable.

11. A connector for multiple-cable connection comprising a connector base, a plurality of conductors each having a pair of conductive tabs arranged in said connector base with one tab of each pair in a different one of two rows, an elongated dielectric lead isolator extending lengthwise of and intermediate said rows, isolating said rows one from the other, said lead isolator having a plurality of holes having means for receiving individually the ends of co-axial cables, said lead isolator also having means defining passages extending laterally with respect to the length of said lead isolator and to each

5

side thereof, said passages being dimensioned to receive different leads of said cable.

12. A connector as set forth in claim 11 wherein said lead isolator is formed with a plurality of slots, each dimensioned and positioned to receive one of said conductive tabs.

13. A connector as set forth in claim 12 wherein said slots and said passages are staggered longitudinally with respect to the length of said lead isolator.

14. A connector as set forth in claim 13 wherein said lead isolator includes top and bottom surfaces, said passages extending from the top surface of said lead isolator and communicating with said means for receiving cables, and said slots extending from the bottom surface of said lead isolator.

15. A connector as set forth in claim 14 wherein said leads of said co-axial cable partially extend lengthwise and adjacent to a side surface of said lead isolator and are in electrical connection with different ones of said tabs.

16. A connector as set forth in claim 11 wherein said first and second leads of said coaxial cable extend through

6

said passages, with one of the leads located closer to said top surface of said lead isolator.

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