

JACK CONNECTOR DEVICE

Background of the Invention

1. Field of the Invention

The present invention relates to a jack connector device and, more in particular, to a jack connector device which can connect a plurality of jack connectors to a printed circuit board.

2. Description of the Related Art

A modular jack connector is printed circuit board mount type connector and is used to connect a cable which is run from outside a communications unit for instance to a printed circuit board present within the communications unit. In recent years, this type of connector has been employed not only for communications units but also for the interface, etc., of an office automation unit and peripheral units.

Such connectors are each employed to receive those modular jacks in a single cable and, in order to correspond to the number of cables to be connected to the printed circuit board, a plurality of connectors are mounted on that printed circuit board.

This type of connector is usually of a compact type and a time consuming operation is required in mounting a larger number of such connectors on the printed circuit board. Readier mounting of the connectors is, therefore, required.

Summary of the Invention

It is accordingly the object of the present

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☒ Drawing(s) : paged ...12... to page 212
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invention to provide a jack connector device which satisfies the aforementioned requirement and ensures its readier mounting on the printed circuit board.

According to the present invention, there is provided a jack connector device for connecting a plurality of jack connectors to a printed circuit board, the jack connector device comprising:

an elongated, insulating housing having socket sections set, in a single array, along a length of the housing and holding jack connectors adapted to receive given plug terminals; and

contact terminals provided in the respective socket sections to connect the plug terminals to the printed circuit board.

According to the above connector structure, a respective recess in the housing which receives the contact terminals corresponds to one modular jack connector. A single housing mounted on the printed circuit board serves as being equivalent to a plurality of modular jack connectors.

Brief Description of the Drawings

Fig. 1 is a front view showing a jack connector device according to an embodiment of the present invention;

Fig. 2 is a top view showing the jack connector device of Fig. 1 as viewed in a direction in which modular jacks are received; and



Fig. 3 is a side view showing the jack connector device of Fig. 1.

Detailed Description of the Preferred Embodiment

Figs. 1 to 3 show a jack connector device according to an embodiment of the present invention. The jack connector device 12 has an elongated housing or holder 14 which is molded. A plurality of (three in Figures) socket sections 16 are provided in a single array in the housing such that they extend along a length of the housing. Contact terminals 18 are arranged below the respective socket sections such that their lower end portions extend, as solder tails 22, from the corresponding lower end surfaces of the respective socket sections 16. The solder tails 22 are inserted into corresponding through holes in an associated printed circuit board (PCB), not shown, and soldering is effected there by, for example, an infrared soldering reflow step to electrically connect the contact terminals 18 to a circuit pattern on the PCB.

A known modular jack, not shown, is inserted into an opening 16b in a top end 16a of the respective socket section 16 and hence fixedly fitted in the socket section 16.

The modular jack, upon being inserted into the socket section, is brought into contact with the contact terminals so that the jack can be electrically connected by the contact terminals 18 to the circuit pattern on



the PCB. The respective socket section 16 correspond to one modular jack connector.

Mount legs 24 extend from the lower surface 20 of the socket section 16. The mount legs 24 are inserted into associated mount holes in the PCB and fixed there, whereby the jack connector device 12 is mounted on the PCB. A housing material, if being properly selected, can not only protect the housing 14 from high temperature due to the soldering of the solder tails 22 by, for example, the infrared soldering reflow step but also maintain a hermetic sealing property. For example, a metal such as aluminum as well as a thermoplastic resin such as hot nylon and polyphenylene sulfide (PPS) is preferable, as the housing material, depending upon the use to which the material is put.

According to the jack connector device 12, the housing 14 can be mounted on the PCB by a single step only, thus performing the same function as mounting a plurality of modular jack connectors on the PCB.

Thus a mounting step preceding a soldering step can be further simplified than the method for mounting respective independent modular jack connectors on the PCB either manually or by a robot.

The housing 14 can be easily molded at a low cost and hence the jack connector device 12 can be manufactured at a low cost.

The number of modular jacks mountable on the jack



connector device 12 is shown as being three but not restricted thereto. By setting any proper number of socket sections 16 in the housing 14, it is possible to readily cope with a different number of modular jacks.

5 A combination of socket sections 16, that is, modular jack connectors, in the jack connector device 12 can also have any combination of differently wired connectors, for example, 4, 6 or 8 wire connectors.

10 According to the jack connector device of the present invention, since a plurality of jack connectors can be mounted in a single housing at a time, the mounting step can more readily be carried out for a brief period of time than when a plurality of modular jack connectors are mounted on a PCB.





What is claimed is:

1. A jack connector device for connecting a plurality of jack connectors to a printed circuit board, comprising:

5 an elongated, insulating housing having socket sections set, in a single array, along a length of the housing and holding jack connectors adapted to receive given plug terminals; and

10 contact terminals provided in the respective socket sections to connect the plug terminals to the printed circuit board.

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Abstract of the Disclosure

A jack connector device allows a plurality of modular jacks to be mounted thereon. An elongated housing is provided in the jack connector device and a plurality of socket sections are set along a length of the housing. One modular jack is fitted into the respective socket section. Further, contact terminals are arranged in the respective socket section. The respective socket section corresponds to the single modular jack connector. By mounting the housing on a printed circuit board, it is possible to achieve the same function as when a plurality of modular jack connectors are mounted on the printed circuit board at a time.

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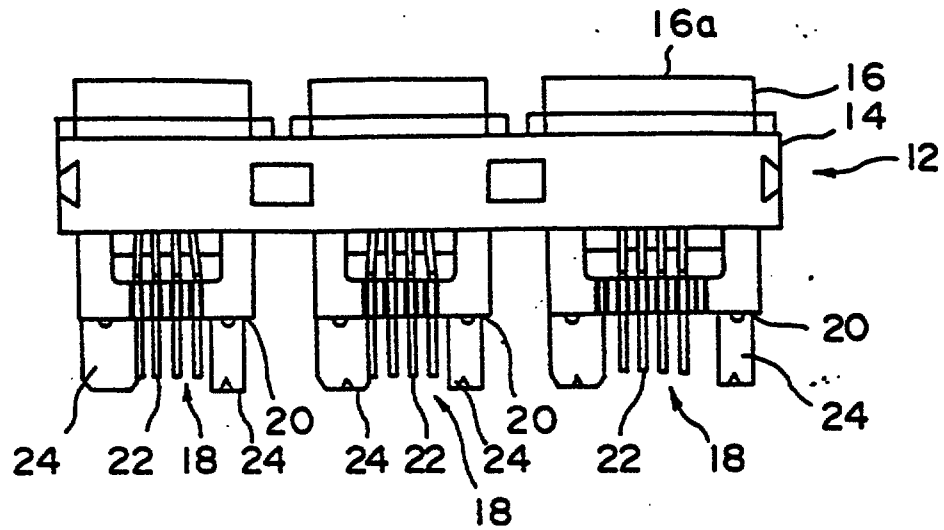


Fig. 1

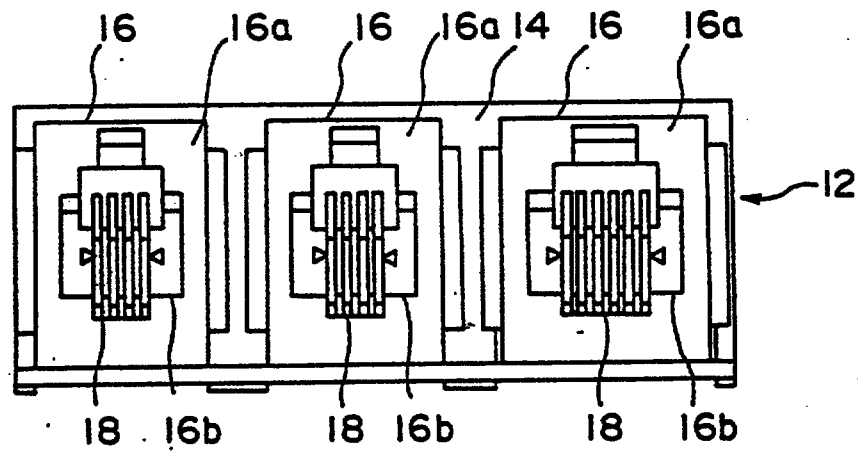


Fig. 2

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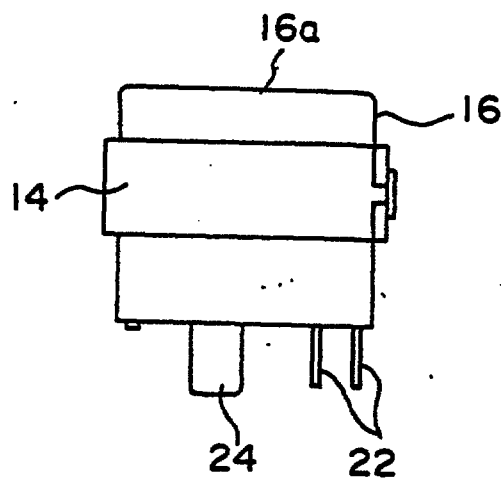


Fig. 3

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JACK CONNECTOR DEVICE

Background of the Invention

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1. Field of the Invention

The present invention relates to a jack connector device and, more in particular, to a jack connector device which can connect a plurality of jack connectors to a printed circuit board.

2. Description of the Related Art

A modular jack connector is printed circuit board mount type connector and is used to connect a cable which is run from outside a communications unit for instance to a printed circuit board present within the communications unit. In recent years, this type of connector has been employed not only for communications units but also for the interface, etc., of an office automation unit and peripheral units.

Such connectors are each employed to receive those modular jacks in a single cable and, in order to correspond to the number of cables to be connected to the printed circuit board, a plurality of connectors are mounted on that printed circuit board.

This type of connector is usually of a compact type and a time consuming operation is required in mounting a larger number of such connectors on the printed circuit board. Readier mounting of the connectors is, therefore, required.

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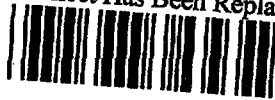


Summary of the Invention

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invention to provide a jack connector device which satisfies the aforementioned requirement and ensures its readier mounting on the printed circuit board.

According to the present invention, there is provided a jack connector device for connecting a plurality of jack connectors to a printed circuit board, the jack connector device comprising:

an elongated, insulating housing having socket sections set, in a single array, along a length of the housing and holding jack connectors adapted to receive given plug terminals; and

contact terminals provided in the respective socket sections to connect the plug terminals to the printed circuit board.

According to the above connector structure, a respective recess in the housing which receives the contact terminals corresponds to one modular jack connector. A single housing mounted on the printed circuit board serves as being equivalent to a plurality of modulator jack connectors.

Brief Description of the Drawings

Fig. 1 is a front view showing a jack connector device according to an embodiment of the present invention;

Fig. 2 is a top view showing the jack connector device of Fig. 1 as viewed in a direction in which modular jacks are received; and

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Fig. 3 is a side view showing the jack connector device of Fig. 1.

Detailed Description of the Preferred Embodiment

Figs. 1 to 3 show a jack connector device according to an embodiment of the present invention. The jack connector device 12 has an elongated housing or holder 14 which is molded. A plurality of (three in Figures) socket sections 16 are provided in a single array in the housing such that they extend along a length of the housing. Contact terminals 18 are arranged below the respective socket sections such that their lower end portions extend, as solder tails 22, from the corresponding lower end surfaces of the respective socket sections 16. The solder tails 22 are inserted into corresponding through holes in an associated printed circuit board (PCB), not shown, and soldering is effected there by, for example, an infrared soldering reflow step to electrically connect the contact terminals 18 to a circuit pattern on the PCB.

A known modular jack, not shown, is inserted into an opening 16b in a top end 16a of the respective socket section 16 and hence fixedly fitted in the socket section 16.

The modular jack, upon being inserted into the socket section, is brought into contact with the contact terminals so that the jack can be electrically connected by the contact terminals 18 to the circuit pattern on



the PCB. The respective socket section 16 correspond to one modular jack connector.

Mount legs 24 extend from the lower surface 20 of the socket section 16. The mount legs 24 are inserted into associated mount holes in the PCB and fixed there, whereby the jack connector device 12 is mounted on the PCB. A housing material, if being properly selected, can not only protect the housing 14 from high temperature due to the soldering of the solder tails 22 by, for example, the infrared soldering reflow step but also maintain a hermetic sealing property. For example, a metal such as aluminum as well as a thermoplastic resin such as hot nylon and polyphenylene sulfide (PPS) is preferable, as the housing material, depending upon the use to which the material is put.

According to the jack connector device 12, the housing 14 can be mounted on the PCB by a single step only, thus performing the same function as mounting a plurality of modular jack connectors on the PCB.

Thus a mounting step preceding a soldering step can be further simplified than the method for mounting respective independent modular jack connectors on the PCB either manually or by a robot.

The housing 14 can be easily molded at a low cost and hence the jack connector device 12 can be manufactured at a low cost.

The number of modular jacks mountable on the jack

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connector device 12 is shown as being three but not restricted thereto. By setting any proper number of socket sections 16 in the housing 14, it is possible to readily cope with a different number of modular jacks.

A combination of socket sections 16, that is, modular jack connectors, in the jack connector device 12 can also have any combination of differently wired connectors, for example, 4, 6 or 8 wire connectors.

According to the jack connector device of the present invention, since a plurality of jack connectors can be mounted in a single housing at a time, the mounting step can more readily be carried out for a brief period of time than when a plurality of modular jack connectors are mounted on a PCB.

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What is claimed is:

1. A jack connector device for connecting a plurality of jack connectors to a printed circuit board, comprising:

an elongated, insulating housing having socket sections set, in a single array, along a length of the housing and holding jack connectors adapted to receive given plug terminals; and

contact terminals provided in the respective socket sections to connect the plug terminals to the printed circuit board.

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JACK CONNECTOR DEVICE

Abstract of the Disclosure

A jack connector device allows a plurality of modular jacks to be mounted thereon. An elongated housing is provided in the jack connector device and a plurality of socket sections are set along a length of the housing. One modular jack is fitted into the respective socket section. Further, contact terminals are arranged in the respective socket section. The respective socket section corresponds to the single modular jack connector. By mounting the housing on a printed circuit board, it is possible to achieve the same function as when a plurality of modular jack connectors are mounted on the printed circuit board at a time.

FIGURE 1

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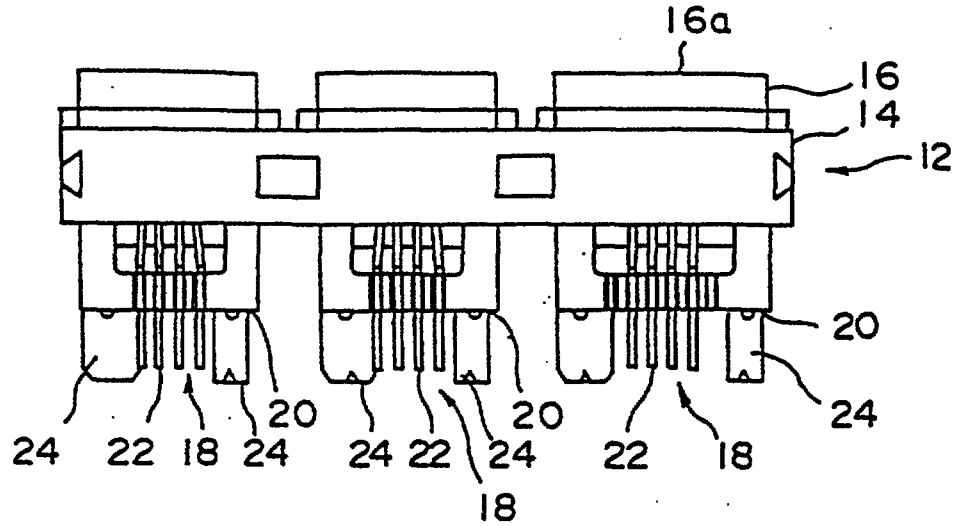


Fig. 1

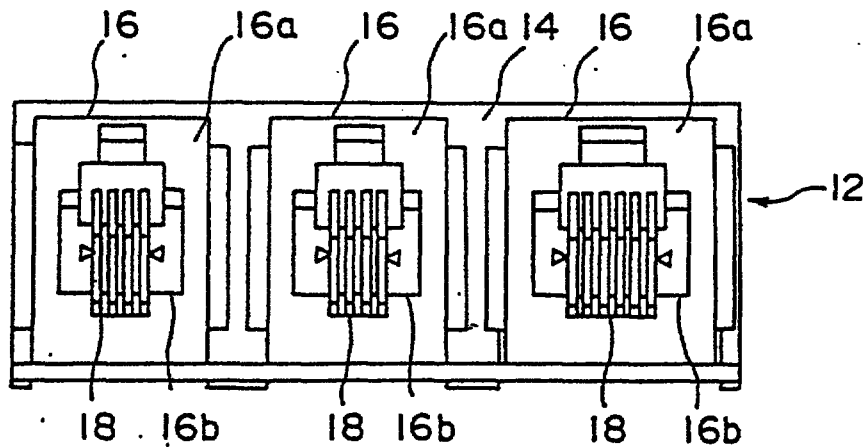


Fig. 2

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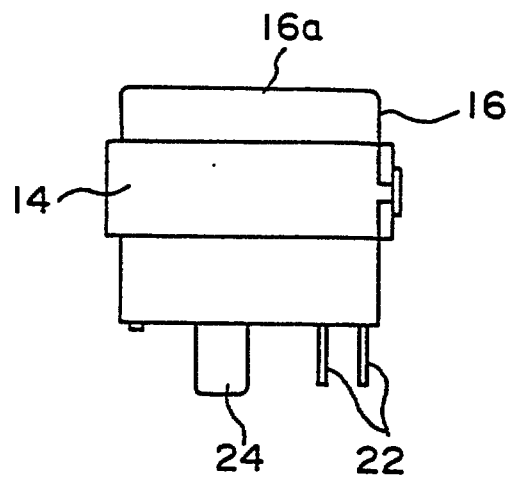


Fig. 3

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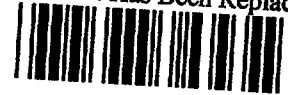
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What is claimed is:

1. A jack connector device for connecting a plurality of jack connectors to a printed circuit board, comprising:
 - 5 an elongated, insulating housing having socket sections set, in a single array, along a length of the housing and holding jack connectors adapted to receive given plug terminals, said jack connectors having a front surface, a back surface and side surface, said insulating housing
 - 10 exposing said front surface and said back surface; and contact terminals provided in the respective socket sections to connect the plug terminals to the printed circuit board.
2. A jack connector device, comprising:
 - 15 a plurality of jack connectors, each of said jack connectors having first walls, and an insulating band for holding said jack connectors, said insulating band having second walls, the height of said second walls of said insulating band being
 - 20 shorter than the height of said first walls of said jack connectors, said jack connectors disposed partially inside said band with a predetermined orientation with respect to said band so as to expose at least a part of said first walls.
- 25 3. The jack connector device according to claim 2, wherein said jack connectors are disposed with a predetermined distance between two adjacent of said jack connectors.
- 30 4. The jack connector device according to claim 2, wherein said insulating band is placed at the approximately mid height of said first side walls of said jack connectors.

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5. The jack connector device according to claim 4, wherein said height of said second walls of said insulating band is approximately one third of the height of said first 5 walls of said jack connectors.

6. The jack connector device according to claim 2, wherein said jack connectors disposed in said insulating band are soldered directly on a circuit board.

7. The jack connector device according to claim 6,
10 wherein each of said jack connectors further comprises a guiding leg for aligning its position with respect to the circuit board.

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JACK CONNECTOR DEVICEAbstract of the Disclosure

A jack connector device allows a plurality of modular jacks to be mounted thereon. An elongated housing is provided in the jack connector device and a plurality of socket sections are set along a length of the housing. One modular jack is fitted into the respective socket section. Further, contact terminals are arranged in the respective socket section. The respective socket section corresponds to the single modular jack connector. By mounting the housing on a printed circuit board, it is possible to achieve the same function as when a plurality of modular jack connectors are mounted on the printed circuit board at a time.

FIGURE 1

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JACK CONNECTOR DEVICE**BACKGROUND OF THE INVENTION****1. Field of the Invention**

The present invention relates to a jack connector device and, in particular, to a jack connector device which connects a plurality of jack connectors to a printed circuit board.

2. Description of the Related Art

A modular jack connector is a printed circuit board mount type connector and is used to connect a cable which is run from outside a communications unit for instance to a printed circuit board present within the communications unit. In recent years, this type of connector has been employed not only for communications units but also for the interface, etc., of an office automation unit and peripheral units.

Such connectors are each employed to receive those modular jacks in a single cable and, in order to correspond to the number of cables to be connected to the printed circuit board, a plurality of connectors are mounted on that printed circuit board.

This type of connector is usually of a compact type and a time consuming operation is required in mounting a larger number of such connectors on the printed circuit board. Readier mounting of the connectors is, therefore, required.

Existing jack connector devices have socket sections, provided for receiving the modular jacks, that are fixed in the device and are not readily removable.

A connector device that provides for easier placement and removal of socket sections is, therefore, required to aid in easier assembly, disassembly, mounting and maintenance.

In addition, existing jack connector devices require relatively complicated manufacturing processes to create the receptacles for the socket sections and/or to secure them in place on the connector device. Connectors without these complex receptacle features, that are relatively simple to manufacture are, therefore, desired.

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SUMMARY OF THE INVENTION

According to one aspect of the present invention, a jack connector device for placing a plurality of jack connectors on a printed circuit board includes an elongated, insulating housing having individual receptacles for receiving socket sections, the receptacles being located in a single array at predetermined, noncontiguous locations along the length of the housing. The housing includes a first piece having a rear wall, two side walls located at the ends of the rear wall at right angles, and a plurality of separating members located between the ends extending from the rear wall in the same direction as the side walls. The housing also includes a second detachable piece mounted opposite said rear wall, having a plurality of holes for receiving the separating members and two cut-out sections for receiving the side walls. The side walls latch the second detachable piece in place, whereby said front wall holds the socket sections at secure positions along the length of the housing between the side walls.

According to a second aspect of the present invention, a jack connector device for placing a plurality of jack connectors on a printed circuit board has an elongated insulating housing having individual receptacles for receiving socket sections. The receptacles being located in a single array at predetermined, non-contiguous locations along the length of the housing. The housing includes: a first piece having a rear wall, two side walls located at the ends of the rear wall at right angles, and a plurality of separating members located between the ends extending from the rear wall in the same direction as the side walls; and a second detachable piece mounted opposite the rear wall, having a plurality of holes for receiving the separating members and two cut-out sections for receiving the side walls, the side walls latching the second detachable piece in place; whereby the front wall holds the socket sections at secure positions along the length of the housing between the side walls, the socket sections having mounting legs for anchoring the socket sections to a printed circuit board.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front view showing a jack connector device according to an embodiment of the present invention;

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FIG. 2 is a top view showing the jack connector device of FIG. 1 as viewed in a direction in which modular jacks are received;

FIG. 3 is a side view showing the jack connector device of FIG. 1; and

FIG. 4 is a front view of the second detachable piece of the housing of the jack connector device of FIG. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

FIGS. 1 to 4 show a jack connector device according to an embodiment of the present invention. The jack connector device 12 has an elongated housing or holder 14 which is molded.

The housing 14, having a generally rectangular shape, comprises two parts. One part comprises a rear wall 14c, two side walls 14d and 14e and a plurality (2 in Figures) of separating members 14b. The rear wall 14c serves as the length of the housing 14 and the two side walls 14d and 14e complete right angles at the ends of the rear wall 14c. The separating members 14b extend from the rear wall 14c. The other part comprises a front wall or a second detachable piece 14a, that completes the rectangular shape of the housing 14.

A plurality of socket sections 16 are provided in a single array in the housing such that they extend along a length of the housing. The separating members 14b serve to provide individual receptacles for each socket section 16. Prior to insertion of the front wall 14a of the housing 14, the socket sections 16 are placed non-contiguously between the side walls 14d and 14e of the housing and the separating members 14b or between consecutive separating members 14b. No two socket sections 16 are positioned in direct contact with one another.

Contact terminals 18 are arranged below the respective socket sections such that their lower end portions extend, as solder tails 22, from the corresponding lower end surfaces of the respective socket sections 16. The solder tails 22 are inserted into corresponding through holes in an associated printed circuit board (PCB), not shown, and soldering is effected there by, for example, an infrared soldering reflow

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step to electrically connect the contact terminals 18 to a circuit pattern on the PCB.

Assembly of the jack connector device 12 is accomplished by first, placing socket sections 16 in the individual receptacles in the housing 14. The detachable front wall 14a receives the ends of the separating members 14b opposite the rear wall 14c of the housing 14 by means of holes 26 of rectangular shape. The front wall 14a, having cut-out sections 28 of rectangular shape, is then set in place by fitting these cut-out sections 28 onto grooves 30 around relatively small extensions on the ends of both side walls 14d and 14e of the housing 14 opposite the rear wall 14c. As shown in FIG. 3, the front wall is latched into place (as well as detached) by means of the extensions of trapezoidal shape 28 at the far ends of the side walls 14d and 14e opposite the rear wall 14c. The socket sections 16 are now secured in place in the jack connector device 12.

A known modular jack, not shown, is inserted into an opening 16b in a top end 16a of a respective socket section 16 and hence secured in the socket section 16.

The modular jack, upon being inserted into the socket section, is brought into contact with the contact terminals so that the jack is electrically connected by the contact terminals 18 to the circuit pattern on the PCB. The respective socket section 16 correspond to one modular jack connector.

Mount legs 24 extend from the lower surface 20 of the socket section 16. The mount legs 24 are inserted into associated mount holes in the PCB and fixed there, whereby the jack connector device 12 is mounted on the PCB. A housing material, if being properly selected, can not only protect the housing 14 from high temperature due to the soldering of the solder tails 22 by, for example, the infrared soldering reflow step but also maintain a hermetic sealing property. For example, a metal such as aluminum as well as a thermoplastic resin such as hot nylon and polyphenylene sulfide (PPS) is preferable, as the housing material, depending upon the use to which the material is put.

According to the jack connector device 12, the housing 14 is mounted on the PCB by a single step only, thus perform-

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ing the same function as mounting a plurality of modular jack connectors on the PCB.

Thus a mounting step preceding a soldering step is further simplified than the method for mounting respective independent modular jack connectors on the PCB either manually or by a robot.

Because of the simplicity of the design of the present invention, the housing 14 is easily molded at a low cost and hence the jack connector device 12 is manufactured at a low cost. The simplicity of the connector device 12 also provides for easier placement and removal of socket sections 16. Only one readily removable piece, i.e., the front wall 14a of the housing 14, serves to secure or release the socket sections from the connector device 12. Placement or removal of the socket sections 16 is particularly easy because the socket sections 16 have their own individual receptacles. Placement or removal of one socket section 16 will not interfere with neighboring ones. Thus, the design of the jack connector device 12, will provide for easier assembly, disassembly, mounting and maintenance.

The number of modular jacks mountable on the jack connector device 12 is shown as being three but not restricted thereto. By setting any proper number of socket sections 16 in the housing 14, it is possible to readily cope with a different number of modular jacks and/or socket sections 16 as a single unit.

It is also possible to combine connector devices by connecting the housing 14 of one jack connector device 12 with the housing 14 of another. A plurality of jack connector devices 12 is joined, by any means known in the art, end to end by joining the side walls 14d and 14e of a housing 14 with the side walls 14d and 14e of a housing 14 of another jack connector device 12. It is also possible for two devices 12 to be joined at their respective rear walls 14c, so that they would be aligned back to back.

Combining jack connector devices 12 in this manner, by joining them either end to end or back to back, will allow one to cope with an even greater number of modular jacks.

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In addition, combining jack connector devices 12 as well as individual jacks into a single unit will provide for readier mounting of a large number of jacks onto a PCB.

A combination of socket sections 16, that is, modular jack connectors, in the jack connector device 12 also has any combination of differently wired connectors, for example, 4, 6, or 8 wire connectors.

According to the preferred embodiment of the jack connector device of the present invention, since a plurality of jack connectors are mounted in a single housing at a time, the mounting step is readily carried out and the jack connectors are easily secured in one step. It is to be understood, however, that even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

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What is claimed is:

1. A jack connector device for placing a plurality of jack connectors on a printed circuit board, comprising an elongated, insulating housing having individual receptacles for receiving the jack connectors, said receptacles being located in a single array at predetermined, non-contiguous locations along the length of said housing, said housing comprising:

a first piece having a rear wall, two side walls located at the ends of said rear wall at right angles, and a plurality of separating members located between said ends extending from said rear wall in the same direction as said side walls; and

a second detachable piece mounted opposite said rear wall, having a plurality of holes for receiving said separating members and two cut-out sections for receiving said side walls, said side walls latching said second detachable piece in place, whereby said front wall holds the jack connectors at secure positions along the length of said housing between said side walls.

2. The jack connector device according to claim 1 wherein said jack connectors are secured in said receptacles.

3. The jack connector device according to claim 1 wherein said holes of said second detachable piece for receiving said separating members are of different dimensions and are relatively larger than said cut-out sections for receiving said side walls.

4. The jack connector device according to claim 1 wherein said second detachable piece has holes of rectangular shape for receiving said separating members.

5. The jack connector device according to claim 1 wherein said side walls latch said second detachable piece by means of extensions at the far ends of said side walls opposite said rear wall.

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6. A jack connector device for placing a plurality of jack connectors on a printed circuit board, comprising an elongated, insulating housing having individual receptacles for receiving the jack connectors, said receptacles being located in a single array at predetermined, non-contiguous locations along the length of said housing, said housing comprising:

- a first piece having a rear wall, two side walls located at the ends of said rear wall at right angles, and a plurality of separating members located between said ends extending from said rear wall in the same direction as said side walls; and
- a second detachable piece mounted opposite said rear wall, having a plurality of holes for receiving said separating members and two cut-out sections for receiving said side walls, said side walls latching said second detachable piece in place;

whereby said front wall holds the jack connectors at secure positions along the length of said housing between said side walls, said socket sections having mounting legs for anchoring said socket sections to a printed circuit board.

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JACK CONNECTOR DEVICE

ABSTRACT

A jack connector device for placing a plurality of jack connectors on a printed circuit board is disclosed. The connector device comprises an elongated, insulating housing having individual receptacles for receiving socket sections. The receptacles are located in a single array at predetermined, non-contiguous locations along the length of the housing. The housing includes a first piece defining the receptacles and a second detachable piece that holds the socket sections securely in place along the length of the housing.

Figure 2

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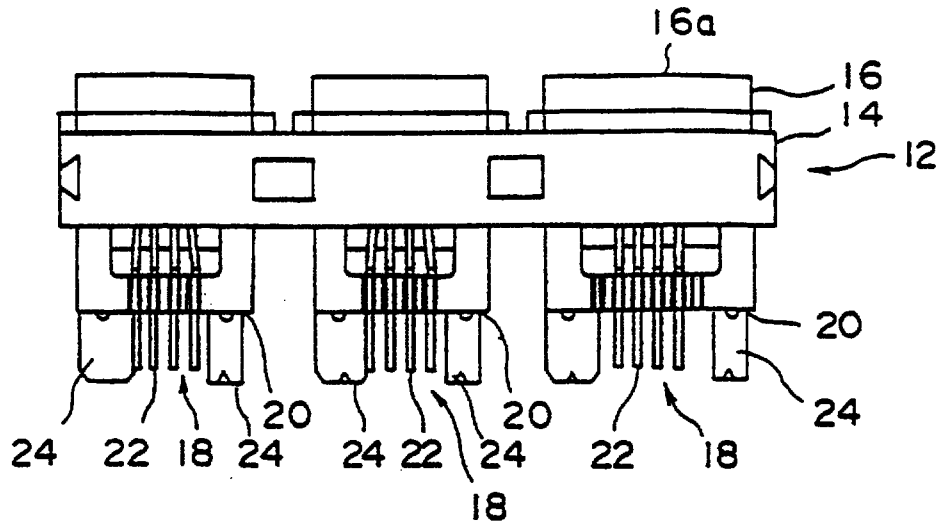


Fig. 1

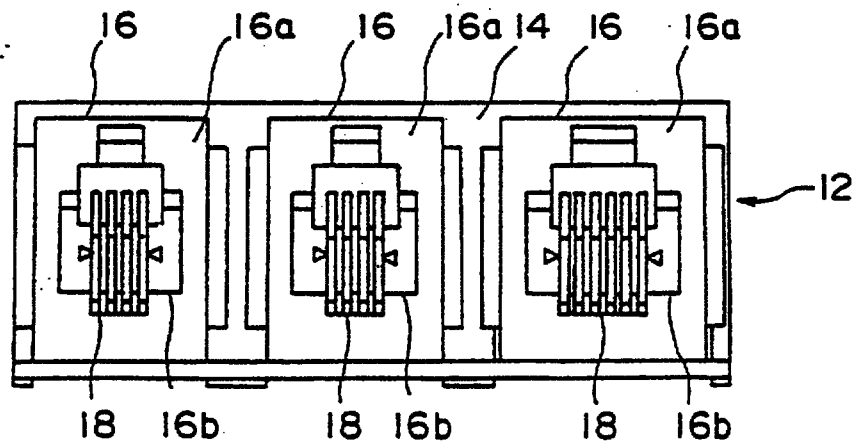


Fig. 2

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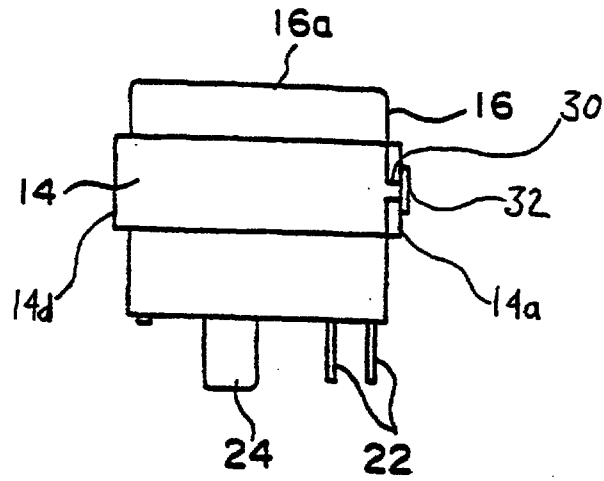


Fig. 3

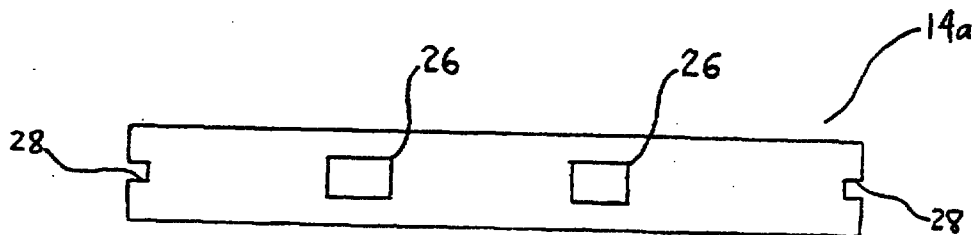


Fig. 4

This is the replacement sheet

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