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(54) **ELECTRICAL CONNECTOR ASSEMBLY**

(57) In an electrical connector assembly, an electrical contacting portion, a transition portion and a fixing portion of each of the first power terminal and the second power terminal are identical to those of each of the first signal terminal and the second signal terminal in size and shape, respectively. The fixing portion of the first power terminal is inserted into an insulation body of the male connector by a first depth, the fixing portion of the first signal terminal is inserted into the insulation body of the male connector (100) by a second depth, and the first depth is greater than the second depth. The fixing portion of the second power terminal is inserted into an insulation body of the female connector (200) by a third depth, the fixing portion of the second signal terminal is inserted into the insulation body of the female connector by a fourth depth, and the third depth is greater than the fourth depth. Therefore, during assembling, the power terminals contact with each other before the signal terminals contact with each other, because the power terminals are inserted into the insulation bodies more deeply than the signal terminals. In this way, the male connector and the female connector may achieve a hot plug-in function.

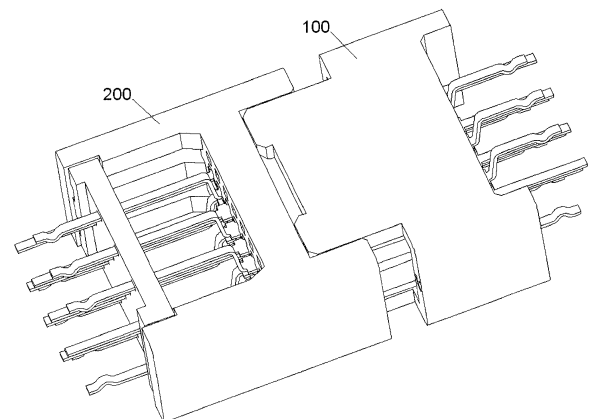


Fig. 1

Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of Chinese Patent Application No. 201520577118.0 filed on August 4, 2015 in the State Intellectual Property Office of China, the whole disclosure of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present disclosure relates to an electrical connector assembly.

Description of the Related Art

[0003] In the prior art, a male connector and a female connector are generally used to connect a circuit board to another circuit board. Such a board-to-board connector does not have a hot plug-in function, that is, electronic elements on the circuit board will be damaged in use due to overlarge instantaneous current if the connector is plugged in or pulled out in the case of power supply.

[0004] In addition, in the prior art, terminals of the male connector and terminals of the female connector are different from each other in shape and size, thereby causing a relatively high manufacturing cost.

SUMMARY OF THE INVENTION

[0005] The present disclosure aims to solve at least one aspect of the above issues and drawbacks in the prior art.

[0006] One objective of the present disclosure is to provide an electrical connector assembly with a hot plug-in function.

[0007] Another objective of the present disclosure is to provide an electrical connector assembly, in which a fixing portion and an electrical contacting portion of a terminal of a male connector may be identical to a fixing portion and an electrical contacting portion of a terminal of a female connector in size and shape, thereby a manufacturing cost may be reduced.

[0008] According to an aspect of the present disclosure, there is provided an electrical connector assembly, comprising: a male connector having a first power terminal for power supply and a first signal terminal for transmitting signal; and a female connector mated with the male connector and having a second power terminal mated with the first power terminal and a second signal terminal mated with the first signal terminal. Each of the first power terminal, the first signal terminal, the second power terminal and the second signal terminal comprises a fixing portion, an electrical contacting portion extending forward from the fixing portion, a soldering portion ex-

tending rearward from the fixing portion, and a transition portion located between the fixing portion and the electrical contacting portion. A total length of the fixing portion, the transition portion and the electrical contacting portion of each of the first power terminal and the second power terminal is equal to a total length of the fixing portion, the transition portion and the electrical contacting portion of each of the first signal terminal and the second signal terminal. The fixing portion of the first power terminal is inserted into an insulation body of the male connector in a longitudinal direction of the male connector by a first depth, the fixing portion of the first signal terminal is inserted into the insulation body of the male connector in the longitudinal direction of the male connector by a second depth, and the first depth is greater than the second depth. The fixing portion of the second power terminal is inserted into an insulation body of the female connector in a longitudinal direction of the female connector by a third depth, the fixing portion of the second signal terminal is inserted into the insulation body of the female connector in the longitudinal direction of the female connector by a fourth depth, and the third depth is greater than the fourth depth.

[0009] According to an exemplary embodiment of the present disclosure, the fixing portion of the first power terminal is totally inserted into the insulation body of the male connector, and the fixing portion of the first signal terminal is partially inserted into the insulation body of the male connector; the fixing portion of the second power terminal is totally inserted into the insulation body of the female connector, the fixing portion of the second signal terminal is partially inserted into the insulation body of the female connector.

[0010] According to another exemplary embodiment of the present disclosure, the electrical contacting portion, the transition portion and the fixing portion of the first power terminal are identical to the electrical contacting portion, the transition portion and the fixing portion of the first signal terminal in size and shape, respectively.

[0011] According to another exemplary embodiment of the present disclosure, the electrical contacting portion, the transition portion and the fixing portion of the first power terminal are identical to the electrical contacting portion, the transition portion and the fixing portion of the second power terminal in size and shape, respectively.

[0012] According to another exemplary embodiment of the present disclosure, the electrical contacting portion, the transition portion and the fixing portion of the first signal terminal are identical to the electrical contacting portion, the transition portion and the fixing portion of the second signal terminal in size and shape, respectively.

[0013] According to another exemplary embodiment of the present disclosure, a first power terminal receiving slot for receiving the first power terminal is formed in the insulation body of the male connector, and a length of the first power terminal receiving slot is equal to or slightly

greater than the total length of the electrical contacting portion, the transition portion and the fixing portion of the first power terminal, such that the fixing portion of the first power terminal is totally inserted into the first power terminal receiving slot.

[0014] According to another exemplary embodiment of the present disclosure, a first signal terminal receiving slot for receiving the first signal terminal is formed in the insulation body of the male connector, and a length of the first signal terminal receiving slot is less than the total length of the electrical contacting portion, the transition portion and the fixing portion of the first signal terminal, such that the fixing portion of the first signal terminal is only partially inserted into the first signal terminal receiving slot.

[0015] According to another exemplary embodiment of the present disclosure, a second power terminal receiving slot for receiving the second power terminal is formed in the insulation body of the female connector, and a length of the second power terminal receiving slot is equal to or slightly greater than the total length of the electrical contacting portion, the transition portion and the fixing portion of the second power terminal, such that the fixing portion of the second power terminal is totally inserted into the second power terminal receiving slot.

[0016] According to another exemplary embodiment of the present disclosure, a second signal terminal receiving slot for receiving the second signal terminal is formed in the insulation body of the female connector, and a length of the second signal terminal receiving slot is less than the total length of the electrical contacting portion, the transition portion and the fixing portion of the second signal terminal, such that the fixing portion of the second signal terminal is only partially inserted into the second signal terminal receiving slot.

[0017] According to another exemplary embodiment of the present disclosure, the male connector comprises a plug, to which the first power terminal receiving slot and the first signal terminal receiving slot extend in the longitudinal direction; and the electrical contacting portion of the first power terminal and the electrical contacting portion of the first signal terminal are received in the first power terminal receiving slot and the first signal terminal receiving slot, respectively.

[0018] According to another exemplary embodiment of the present disclosure, the female connector comprises a plug cavity, the second power terminal receiving slot and the second signal terminal receiving slot extending to a top wall and a bottom wall of the plug cavity in the longitudinal direction; and the electrical contacting portion of the second power terminal and the electrical contacting portion of the second signal terminal are received in the second power terminal receiving slot and the second signal terminal receiving slot, respectively.

[0019] According to another exemplary embodiment of the present disclosure, the male connector comprises a pair of positioning plates located above and below the plug, respectively; and the female connector comprises

a pair of recesses located above and below the plug cavity, respectively, and adapted to be mated with the pair of positioning plates.

[0020] According to another exemplary embodiment of the present disclosure, an alignment slot is formed in at least one of the pair of positioning plates of the male connector; and an alignment protrusion configured for being mated with the alignment slot is formed on at least one of the pair of recesses of the female connector.

[0021] According to another exemplary embodiment of the present disclosure, the first power terminal comprises a first power supply terminal and a first grounding terminal, and the second power terminal comprises a second power supply terminal and a second grounding terminal.

[0022] According to another aspect of the present disclosure, there is provided an electrical connector, comprising a power terminal for power supply and a signal terminal for transmitting signal, wherein each of the power terminal, the signal terminal comprises a fixing portion, an electrical contacting portion extending forward from the fixing portion, a soldering portion extending rearward from the fixing portion, and a transition portion located between the fixing portion and the electrical contacting portion, wherein a total length of the electrical contacting portion, the transition portion and the fixing portion of the power terminal is equal to a total length of the electrical contacting portion, the transition portion and the fixing portion of the signal terminal, and wherein the fixing portion of the power terminal is inserted into an insulation body of the connector in a longitudinal direction of the connector by a first depth, the fixing portion of the signal terminal is inserted into the insulation body of the connector in the longitudinal direction of the connector by a second depth, and the first depth is greater than the second depth.

[0023] In each of the above-described embodiments according to the present disclosure, since the fixing portions of the power terminals are inserted into the insulation bodies of the connectors in a longitudinal direction more deeply than the fixing portions of the signal terminals, the power terminals of the male and female connectors come into contact with each other before the signal terminals of the male and female connectors come into contact with each other during assembling the male and female connectors; and the signal terminals of the male and female connectors are detached from each other before the power terminals of the male and female connectors are detached from each other during disassembling the male and female connectors, thus a hot plug-in function may be achieved.

[0024] In addition, in some embodiments of the present disclosure, the fixing portion and the electrical contacting portion of the terminal of the male connector are identical to the fixing portion and the electrical contacting portion of the terminal of the female connector in size and shape, respectively, thereby reducing the manufacturing cost.

[0025] Other objectives and advantages of the present

disclosure will become apparent by means of the following description of the present disclosure with reference to the accompanying drawings, which may facilitate comprehensive understanding of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026]

Fig. 1 shows a schematic perspective view of an electrical connector assembly according to an exemplary embodiment of the present disclosure, in which a male connector and a female connector mated with each other;

Fig. 2 shows a top view of the electrical connector assembly shown in Fig. 1;

Fig. 3 shows a schematic perspective view of the male connector shown in Fig. 1;

Fig. 4 shows a schematic perspective view of the female connector shown in Fig. 1;

Fig. 5 shows a schematic perspective view of a power terminal of the male connector or the female connector shown in Fig. 1;

Fig. 6 shows a schematic perspective view of a signal terminal of the male connector or the female connector shown in Fig. 1;

Fig. 7 shows a spatial arrangement view of terminals of the male connector shown in Fig. 3 and terminals of the female connector shown in Fig. 4;

Fig. 8 shows a longitudinal cross-sectional view of the male connector shown in Fig. 3; and

Fig. 9 shows a longitudinal cross-sectional view of the female connector shown in Fig. 4.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS OF THE INVENTION

[0027] The present disclosure will be further described hereinafter in detail with reference to embodiments, in combination with the accompanying drawings. In the specification, the same or like reference numerals refer to the same or like elements. The following description of the implementations of the present disclosure with reference to the accompanying drawings is intended to explain the general concept of the present disclosure, rather than limiting the present disclosure.

[0028] Furthermore, for the purpose of explanation, many specific details are set forth in the detailed description below to provide a comprehensive understanding for the embodiments of the present disclosure. However, obviously, one or more embodiments may be implemented without these specific details. In other cases, well-known structures and devices are embodied in an illustration manner to simplify the accompanying drawings.

[0029] According to a general concept of the present disclosure, there is provided an electrical connector assembly, comprising: a male connector having a first power terminal for power supply and a first signal terminal

for transmitting signal; and a female connector mated with the male connector and having a second power terminal mated with the first power terminal and a second signal terminal mated with the first signal terminal, wherein each of the first power terminal, the first signal terminal, the second power terminal and the second signal terminal comprises a fixing portion, an electrical contacting portion extending forward from the fixing portion, a soldering portion extending rearward from the fixing portion, and a transition portion located between the fixing portion and the electrical contacting portion, wherein a total length of the fixing portion, the transition portion and the electrical contacting portion of each of the first power terminal and the second power terminal is equal to a total length of the fixing portion, the transition portion and the electrical contacting portion of each of the first signal terminal and the second signal terminal, wherein the fixing portion of the first power terminal is inserted into an insulation body of the male connector in a longitudinal direction of the male connector by a first depth, the fixing portion of the first signal terminal is inserted into the insulation body of the male connector in the longitudinal direction of the male connector by a second depth, and the first depth is greater than the second depth, and wherein the fixing portion of the second power terminal is inserted into an insulation body of the female connector in a longitudinal direction of the female connector by a third depth, the fixing portion of the second signal terminal is inserted into the insulation body of the female connector in the longitudinal direction of the female connector by a fourth depth, and the third depth is greater than the fourth depth.

[0030] Fig. 1 shows a schematic perspective view of an electrical connector assembly according to an exemplary embodiment of the present disclosure, in which a male connector 100 and a female connector 200 mated with each other. Fig. 2 shows a top view of the electrical connector assembly shown in Fig. 1.

[0031] In an exemplary embodiment of the present disclosure, there is disclosed an electrical connector assembly. As shown in Figs. 1 and 2, in the illustrated embodiment, the electrical connector assembly mainly comprises a male connector 100 and a female connector 200 mated with the male connector 100.

[0032] As shown in Fig. 2, the male connector 100 has a first power terminal 101 for power supply and a first signal terminal 102 for transmitting signal. Correspondingly, as shown in Fig. 2, the female connector 200 has a second power terminal 201 mated with the first power terminal 101 and a second signal terminal 202 mated with the first signal terminal 102.

[0033] Fig. 5 shows a schematic perspective view of the power terminal 101, 102 of the male connector 100 or the female connector 200 shown in Fig. 1; Fig. 6 shows a schematic perspective view of the signal terminal 102, 202 of the male connector 100 or the female connector 200 shown in Fig. 1.

[0034] As clearly shown in Figs. 5 and 6, in the illus-

trated embodiment, each of the first power terminal 101, the first signal terminal 102, the second power terminal 201 and the second signal terminal 202 comprises: a fixing portion 101b, 102b, 201b, 202b, an electrical contacting portion 101a, 102a, 201a, 202a extending forward from the fixing portion 101b, 102b, 201b, 202b, and a soldering portion 101c, 102c, 201c, 202c extending rearward from the fixing portion 101b, 102b, 201b, 202b. Furthermore, as shown in Figs. 5 and 6, in the illustrated embodiment, a smooth transition portion 101d, 102d, 201d, 202d is located between the fixing portion 101b, 102b, 201b, 202b and the electrical contacting portion 101a, 102a, 201a, 202a of each terminal.

[0035] As clearly shown in Figs. 5 and 6, in the illustrated embodiment, the fixing portion 101b, 102b, 201b, 202b of the terminal has a width greater than the electrical contacting portion 101a, 102a, 201a, 202a and the soldering portion 101c, 102c, 201c, 202c. Furthermore, dentate barb features for securely holding the fixing portion 101b, 102b, 201b, 202b of the terminal in an insulation body of the connector are formed on edges of the fixing portion 101b, 102b, 201b, 202b of the terminal.

[0036] In an exemplary embodiment of the present disclosure, as shown in Figs. 5 and 6, a total length L of the electrical contacting portion 101a, 201a, the transition portion 101d, 201d and the fixing portion 101b, 201b of each of the first power terminal 101 and the second power terminal 201 is equal to a total length L of the electrical contacting portion 102a, 202a, the transition portion 102d, 202d and the fixing portion 102b, 202b of each of the first signal terminal 102 and the second signal terminal 202. In the above-described embodiment, as shown in Figs. 5 and 6, the above-described total length L refers to a length from a rear end (right end) of the fixing portion to a front end (left end) of the electrical contacting portion of each terminal.

[0037] Fig. 3 shows a schematic perspective view of the male connector 100 shown in Fig. 1; Fig. 4 shows a schematic perspective view of the female connector 200 shown in Fig. 1.

[0038] As shown in Figs. 2-4, in the illustrated embodiment, the fixing portion 101b of the first power terminal 101 is inserted into an insulation body of the male connector 100 in a longitudinal direction of the male connector 100 by a first insertion depth, the fixing portion 102b of the first signal terminal 102 is inserted into the insulation body of the male connector 100 in the longitudinal direction of the male connector 100 by a second insertion depth, and the first insertion depth is greater than the second insertion depth. The fixing portion 201b of the second power terminal 201 is inserted into an insulation body of the female connector 200 in a longitudinal direction of the female connector 200 by a third insertion depth, the fixing portion 202b of the second signal terminal 202 is inserted into the insulation body of the female connector 200 in the longitudinal direction of the female connector 200 by a fourth insertion depth, and the third insertion depth is greater than the fourth insertion depth.

[0039] Fig. 7 shows a spatial arrangement view of terminals 101, 102 of the male connector 100 shown in Fig. 3 and terminals 201, 202 of the female connector 200 shown in Fig. 4.

[0040] Thus, as shown in Figs. 3, 4 and 7, since the total length L of the electrical contacting portion 101a, 201a, the transition portion 101d, 201d and the fixing portion 101b, 201b of each of the first power terminal 101 and the second power terminal 201 is equal to the total length L of the electrical contacting portion 102a, 202a, the transition portion 102d, 202d and the fixing portion 102b, 202b of each of the first signal terminal 102 and the second signal terminal 202, in the case that the male and female connectors 100, 200 are assembled together, a front end of the electrical contacting portion 101a of the first power terminal 101 extends beyond a front end of the electrical contacting portion 102a of the first signal terminal 102, and a front end of the electrical contacting portion 201a of the second power terminal 201 extends beyond a front end of the electrical contacting portion 202a of the second signal terminal 202.

[0041] Thus, as shown in Fig. 7, in the illustrated embodiment, the power terminals 101, 201 of the male and female connectors 100, 200, which have the first and third insertion depths, come into contact with each other before the signal terminals 102, 202 of the male and female connectors 100, 200, which have the second and fourth insertion depths, come into contact with each other during assembling the male and female connectors 100, 200; on the other hand, the signal terminals 102, 202 of the male and female connectors 100, 200 are detached from each other before the power terminals 101, 201 of the male and female connectors 100, 200 are detached from each other during disassembling the male and female connectors 100, 200, thus a hot plug-in function may be achieved.

[0042] As shown in Figs. 2, 5 and 6, in the illustrated embodiment, the fixing portion 101b of the first power terminal 101 is totally inserted into the insulation body of the male connector 100, and the fixing portion 102b of the first signal terminal 102 is partially inserted into the insulation body of the male connector 100; similarly, the fixing portion 201b of the second power terminal 201 is totally inserted into the insulation body of the female connector 200, and the fixing portion 202b of the second signal terminal 202 is partially inserted into the insulation body of the female connector 200.

[0043] Fig. 8 shows a longitudinal cross-sectional view of the male connector 100 shown in Fig. 3; and Fig. 9 shows a longitudinal cross-sectional view of the female connector 200 shown in Fig. 4.

[0044] As shown in Fig. 8, since the fixing portion 101b of the first power terminal 101 is totally inserted into the insulation body of the male connector 100, and the fixing portion 102b of the first signal terminal 102 is partially inserted into the insulation body of the male connector 100, a length L1, by which the fixing portion 101b of the first power terminal 101 is held in the insulation body, is

greater than a length L2, by which the fixing portion 102b of the first signal terminal 102 is held in the insulation body.

[0045] Similarly, as shown in Fig. 9, since the fixing portion 201b of the second power terminal 201 is totally inserted into the insulation body of the female connector 200, and the fixing portion 202b of the second signal terminal 202 is partially inserted into the insulation body of the female connector 200, a length L1, by which the fixing portion 201b of the second power terminal 201, is held in the insulation body is greater than a length L2, by which the fixing portion 202b of the second signal terminal 202 is held in the insulation body.

[0046] In an exemplary embodiment of the present disclosure, the electrical contacting portion 101a, the transition portion 101d and the fixing portion 101b of the first power terminal 101 are identical to the electrical contacting portion 102a, the transition portion 102d and the fixing portion 102b of the first signal terminal 102 in size and shape, respectively.

[0047] In an exemplary embodiment of the present disclosure, the electrical contacting portion 101a, the transition portion 101d and the fixing portion 101b of the first power terminal 101 are identical to the electrical contacting portion 201a, the transition portion 201d and the fixing portion 201b of the second power terminal 201 in size and shape, respectively.

[0048] In an exemplary embodiment of the present disclosure, the electrical contacting portion 102a, the transition portion 102d and the fixing portion 102b of the first signal terminal 102 are identical to the electrical contacting portion 202a, the transition portion 202d and the fixing portion 202b of the second signal terminal 202 in size and shape, respectively.

[0049] In the above-described embodiments, since the fixing portions 101b, 102b, the transition portion 101d, 102d and the electrical contacting portion 101c, 102c of the terminals 101, 102 of the male connector 100 are identical to the fixing portions 201b, 202b, the transition portion 201d, 202d and the electrical contacting portion 201c, 202c of the terminals 201, 202 of the female connector 200 in size and shape, respectively, thereby reducing the manufacturing cost of the terminals.

[0050] As shown in Fig. 3, in an embodiment of the present disclosure, a first power terminal receiving slot 110 for receiving the first power terminal 101 is formed in the insulation body of the male connector 100, and a length of the first power terminal receiving slot 110 is equal to or slightly greater than the total length of the electrical contacting portion 101a, the transition portion 101d and the fixing portion 101b of the first power terminal 101, such that the fixing portion 101b of the first power terminal 101 is totally inserted into the first power terminal receiving slot 110.

[0051] Please still refer to Fig. 3, in the illustrated embodiment, a first signal terminal receiving slot 120 for receiving the first signal terminal 102 is formed in the insulation body of the male connector 100, and a length

of the first signal terminal receiving slot 120 is less than the total length of the electrical contacting portion 102a, the transition portion 102d and the fixing portion 102b of the first signal terminal 102, such that the fixing portion 102b of the first signal terminal 102 is only partially inserted into the first signal terminal receiving slot 120.

[0052] As shown in Fig. 4, in an embodiment of the present disclosure, a second power terminal receiving slot 210 for receiving the second power terminal 201 is formed in the insulation body of the female connector 200, and a length of the second power terminal receiving slot 210 is equal to or slightly greater than the total length of the electrical contacting portion 201a, the transition portion 201d and the fixing portion 201b of the second power terminal 201, such that the fixing portion 201b of the second power terminal 201 is totally inserted into the second power terminal receiving slot 210.

[0053] Please still refer to Fig. 4, in the illustrated embodiment, a second signal terminal receiving slot 220 for receiving the second signal terminal 202 is formed in the insulation body of the female connector 200, and a length of the second signal terminal receiving slot 220 is less than the total length of the electrical contacting portion 202a, the transition portion 202d and the fixing portion 202b of the second signal terminal 202, such that the fixing portion 202b of the second signal terminal 202 is only partially inserted into the second signal terminal receiving slot 220.

[0054] Please refer to Fig. 3 again, in the illustrated embodiment, the male connector 100 comprises a plug 130, to which the first power terminal receiving slot 110 and the first signal terminal receiving slot 120 extend in the longitudinal direction, and the electrical contacting portion 101a of the first power terminal 101 and the electrical contacting portion 102a of the first signal terminal 102 are received in the first power terminal receiving slot 110 and the first signal terminal receiving slot 120, respectively.

[0055] Correspondingly, in the illustrated embodiment, the female connector 200 comprises a plug cavity 230, the second power terminal receiving slot 210 and the second signal terminal receiving slot 220 extend to a top wall and a bottom wall of the plug cavity 230 in the longitudinal direction, and the electrical contacting portion 201a of the second power terminal 201 and the electrical contacting portion 202a of the second signal terminal 202 are received in the second power terminal receiving slot 210 and the second signal terminal receiving slot 220, respectively.

[0056] As shown in Figs. 3 and 4, in the illustrated embodiment, the male connector 100 comprises a pair of positioning plates 140, 150 located above and below the plug 130, respectively, and the female connector 200 comprises a pair of recesses 240, 250 located above and below the plug cavity 230, respectively, and adapted to be mated with the pair of positioning plates 140, 150. Thus, the male connector 100 and the female connector 200 may be securely held with each other.

[0057] As shown in Figs. 3 and 4, in the illustrated embodiment, an alignment slot 141 is formed in at least one of the pair of positioning plates 140, 150 of the male connector 100, and an alignment protrusion 241 configured for being mated with the alignment slot 141 is formed on at least one of the pair of recesses 240, 250 of the female connector 200. Thus, the male connector 100 and the female connector 200 are assembled with each other in a correct manner.

[0058] It should be noted that, in the above-described embodiment, the first power terminal 101 comprises a power supply terminal and a grounding terminal; similarly, the second power terminal 201 also comprises a power supply terminal and a grounding terminal.

[0059] In another exemplary embodiment of the present disclosure, there is disclosed an electrical connector, comprising a power terminal 101 for power supply and a signal terminal 102 for transmitting signal, wherein each of the power terminal 101, the signal terminal 102 comprises a fixing portion 101b, 102b, an electrical contacting portion 101a, 102a extending forward from the fixing portion 101b, 102b, a soldering portion 101c, 102c extending rearward from the fixing portion 101b, 102b, and a transition portion 101d, 102d located between the fixing portion 101b, 102b and the electrical contacting portion 101a, 102a. A total length of the electrical contacting portion 101a, the transition portion 101d and the fixing portion 101b of the power terminal 101 is equal to a total length of the electrical contacting portion 102a, the transition portion 102d and the fixing portion 102b of the signal terminal 102. The fixing portion 101b of the power terminal 101 is inserted into an insulation body of the connector 100 in a longitudinal direction of the connector 100 by a first insertion depth, the fixing portion 102b of the signal terminal 102 is inserted into the insulation body of the connector 100 in the longitudinal direction of the connector 100 by a second insertion depth, and the first depth is greater than the second depth.

[0060] It should be appreciated for those skilled in this art that the above embodiments are intended to be illustrated, and not restrictive. For example, many modifications may be made to the above embodiments by those skilled in this art, and various features described in different embodiments may be freely combined with each other without conflicting in configuration or principle.

[0061] Although several exemplary embodiments have been shown and described, it would be appreciated by those skilled in the art that various changes or modifications may be made in these embodiments without departing from the principles and spirit of the disclosure, the scope of which is defined in the claims and their equivalents.

[0062] As used herein, an element recited in the singular and proceeded with the word "a" or "an" should be understood as not excluding plural of said elements or steps, unless such exclusion is explicitly stated. Furthermore, references to "one embodiment" of the present invention are not intended to be interpreted as excluding

the existence of additional embodiments that also incorporate the recited features. Moreover, unless explicitly stated to the contrary, embodiments "comprising" or "having" an element or a plurality of elements having a particular property may include additional such elements not having that property.

Claims

1. An electrical connector assembly, comprising:

a male connector having a first power terminal for power supply and a first signal terminal for transmitting signal; and

a female connector mated with the male connector and having a second power terminal mated with the first power terminal and a second signal terminal mated with the first signal terminal,

wherein each of the first power terminal, the first signal terminal, the second power terminal and the second signal terminal comprises a fixing portion, an electrical contacting portion extending forward from the fixing portion, a soldering portion (101c, 102c, 201c, 202c) extending rearward from the fixing portion, and a transition portion located between the fixing portion and the electrical contacting portion,

wherein a total length of the fixing portion, the transition portion and the electrical contacting portion of each of the first power terminal and the second power terminal is equal to a total length of the fixing portion, the transition portion and the electrical contacting portion of each of the first signal terminal and the second signal terminal,

wherein the fixing portion of the first power terminal is inserted into an insulation body of the male connector in a longitudinal direction of the male connector by a first depth, the fixing portion of the first signal terminal is inserted into the insulation body of the male connector in the longitudinal direction of the male connector by a second depth, and the first depth is greater than the second depth, and

wherein the fixing portion of the second power terminal is inserted into an insulation body of the female connector in a longitudinal direction of the female connector by a third depth, the fixing portion of the second signal terminal is inserted into the insulation body of the female connector in the longitudinal direction of the female connector by a fourth depth, and the third depth is greater than the fourth depth.

2. The electrical connector assembly according to claim 1, wherein the fixing portion of the first power

terminal is totally inserted into the insulation body of the male connector, and the fixing portion of the first signal terminal is partially inserted into the insulation body of the male connector, and
 wherein the fixing portion of the second power terminal is totally inserted into the insulation body of the female connector, the fixing portion of the second signal terminal is partially inserted into the insulation body of the female connector.

3. The electrical connector assembly according to claim 1, wherein the electrical contacting portion, the transition portion and the fixing portion of the first power terminal are identical to the electrical contacting portion, the transition portion and the fixing portion of the first signal terminal in size and shape, respectively.
4. The electrical connector assembly according to claim 3, wherein the electrical contacting portion, the transition portion and the fixing portion of the first power terminal are identical to the electrical contacting portion, the transition portion and the fixing portion of the second power terminal in size and shape, respectively.
5. The electrical connector assembly according to claim 4, wherein the electrical contacting portion, the transition portion and the fixing portion of the first signal terminal are identical to the electrical contacting portion, the transition portion and the fixing portion of the second signal terminal in size and shape, respectively.
6. The electrical connector assembly according to claim 3, wherein a first power terminal receiving slot for receiving the first power terminal is formed in the insulation body of the male connector, and a length of the first power terminal receiving slot is equal to or slightly greater than the total length of the electrical contacting portion, the transition portion and the fixing portion of the first power terminal, such that the fixing portion of the first power terminal is totally inserted into the first power terminal receiving slot.
7. The electrical connector assembly according to claim 6, wherein a first signal terminal receiving slot for receiving the first signal terminal is formed in the insulation body of the male connector, and a length of the first signal terminal receiving slot is less than the total length of the electrical contacting portion, the transition portion and the fixing portion of the first signal terminal, such that the fixing portion of the first signal terminal is only partially inserted into the first signal terminal receiving slot.
8. The electrical connector assembly according to claim 3, wherein a second power terminal receiving

slot for receiving the second power terminal is formed in the insulation body of the female connector, and a length of the second power terminal receiving slot is equal to or slightly greater than the total length of the electrical contacting portion, the transition portion and the fixing portion of the second power terminal, such that the fixing portion of the second power terminal is totally inserted into the second power terminal receiving slot.

9. The electrical connector assembly according to claim 8, wherein a second signal terminal receiving slot for receiving the second signal terminal is formed in the insulation body of the female connector, and a length of the second signal terminal receiving slot is less than the total length of the electrical contacting portion, the transition portion and the fixing portion of the second signal terminal, such that the fixing portion of the second signal terminal is only partially inserted into the second signal terminal receiving slot.
10. The electrical connector assembly according to claim 9, wherein the male connector comprises a plug, to which the first power terminal receiving slot and the first signal terminal receiving slot extend, and wherein the electrical contacting portion of the first power terminal and the electrical contacting portion of the first signal terminal are received in the first power terminal receiving slot and the first signal terminal receiving slot, respectively.
11. The electrical connector assembly according to claim 10, wherein the female connector comprises a plug cavity, the second power terminal receiving slot and the second signal terminal receiving slot extending to a top wall and a bottom wall of the plug cavity, and
 wherein the electrical contacting portion of the second power terminal and the electrical contacting portion of the second signal terminal are received in the second power terminal receiving slot and the second signal terminal receiving slot, respectively.
12. The electrical connector assembly according to claim 11, wherein the male connector comprises a pair of positioning plates located above and below the plug, respectively, and
 wherein the female connector comprises a pair of recesses located above and below the plug cavity, respectively, and adapted to be mated with the pair of positioning plates.
13. The electrical connector assembly according to claim 12, wherein an alignment slot is formed in at least one of the pair of positioning plates of the male connector, and
 wherein an alignment protrusion configured for being

mated with the alignment slot is formed on at least one of the pair of recesses of the female connector.

14. The electrical connector assembly according to claim 1, wherein the first power terminal comprises a first power supply terminal and a first grounding terminal, and the second power terminal comprises a second power supply terminal and a second grounding terminal.
15. An electrical connector, comprising a power terminal for power supply and a signal terminal for transmitting signal, wherein each of the power terminal, the signal terminal comprises a fixing portion, an electrical contacting portion extending forward from the fixing portion, a soldering portion extending rearward from the fixing portion, and a transition portion located between the fixing portion and the electrical contacting portion, wherein a total length of the electrical contacting portion, the transition portion and the fixing portion of the power terminal is equal to a total length of the electrical contacting portion, the transition portion and the fixing portion of the signal terminal, and wherein the fixing portion of the power terminal is inserted into an insulation body of the connector in a longitudinal direction of the connector by a first depth, the fixing portion of the signal terminal is inserted into the insulation body of the connector in the longitudinal direction of the connector by a second depth, and the first depth is greater than the second depth.

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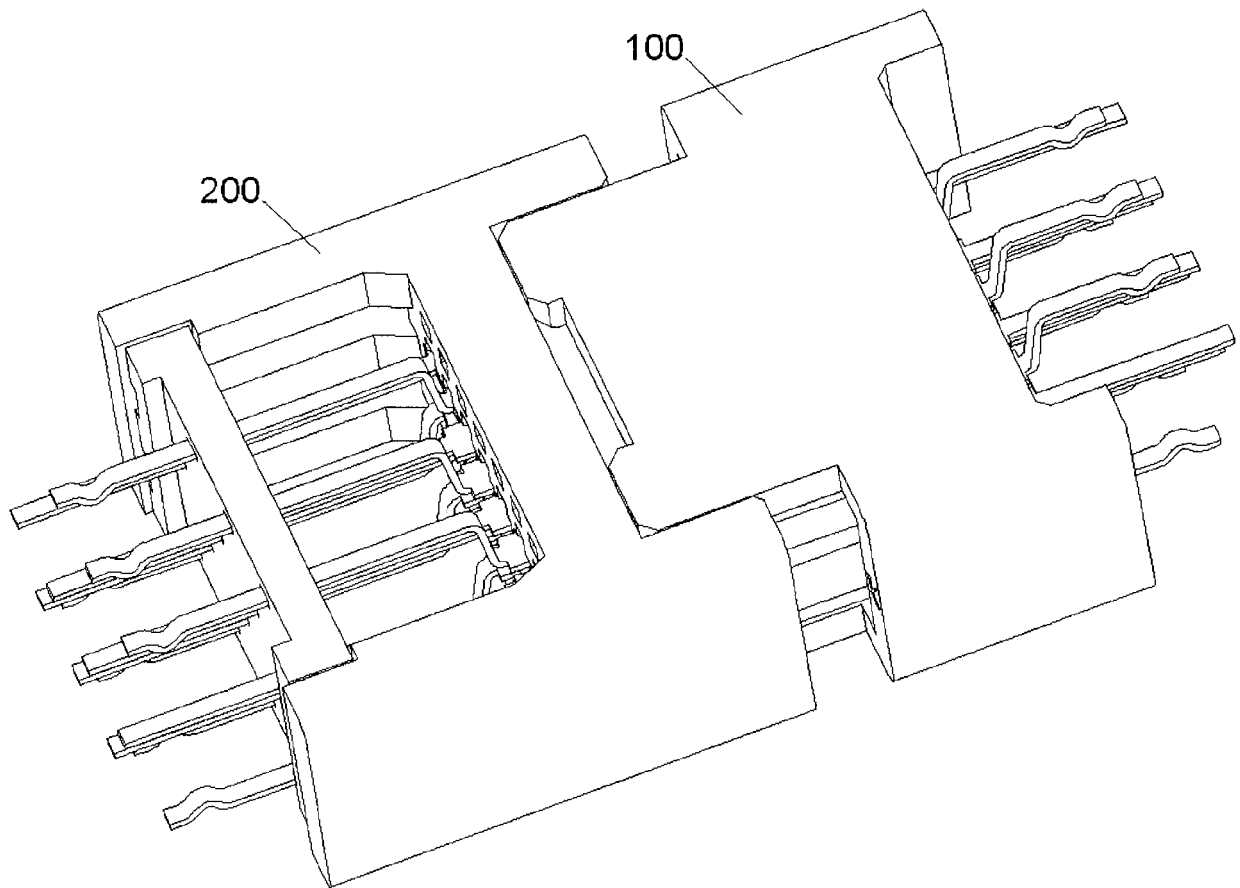


Fig. 1

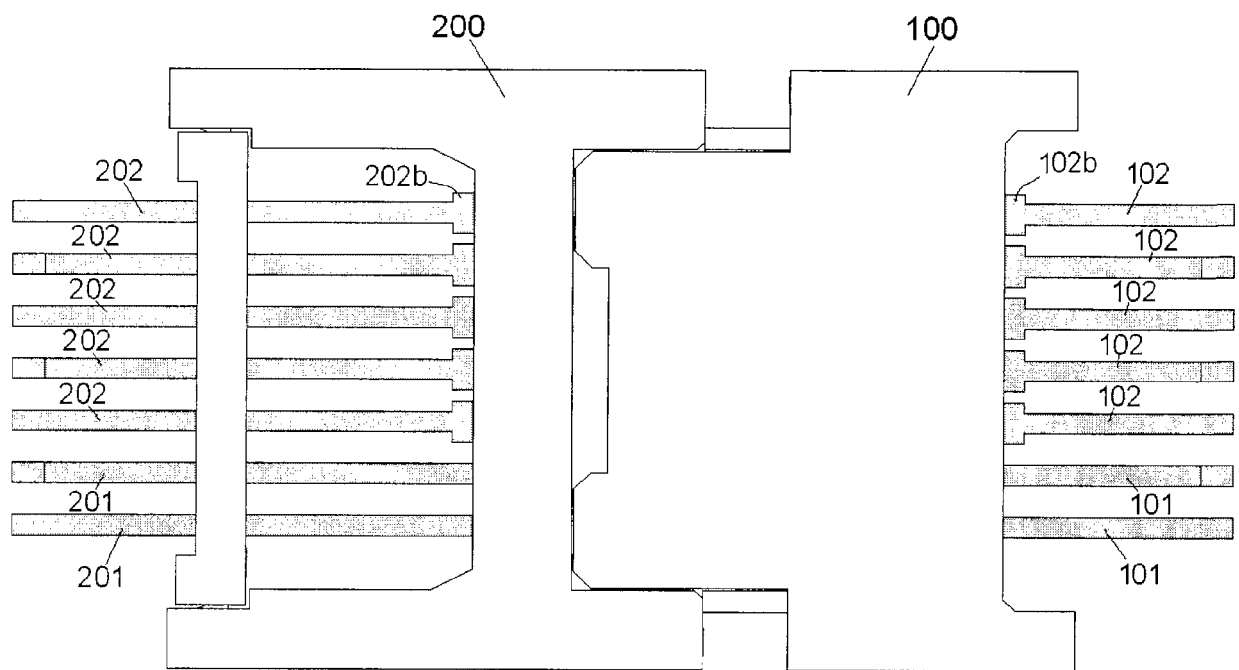


Fig. 2

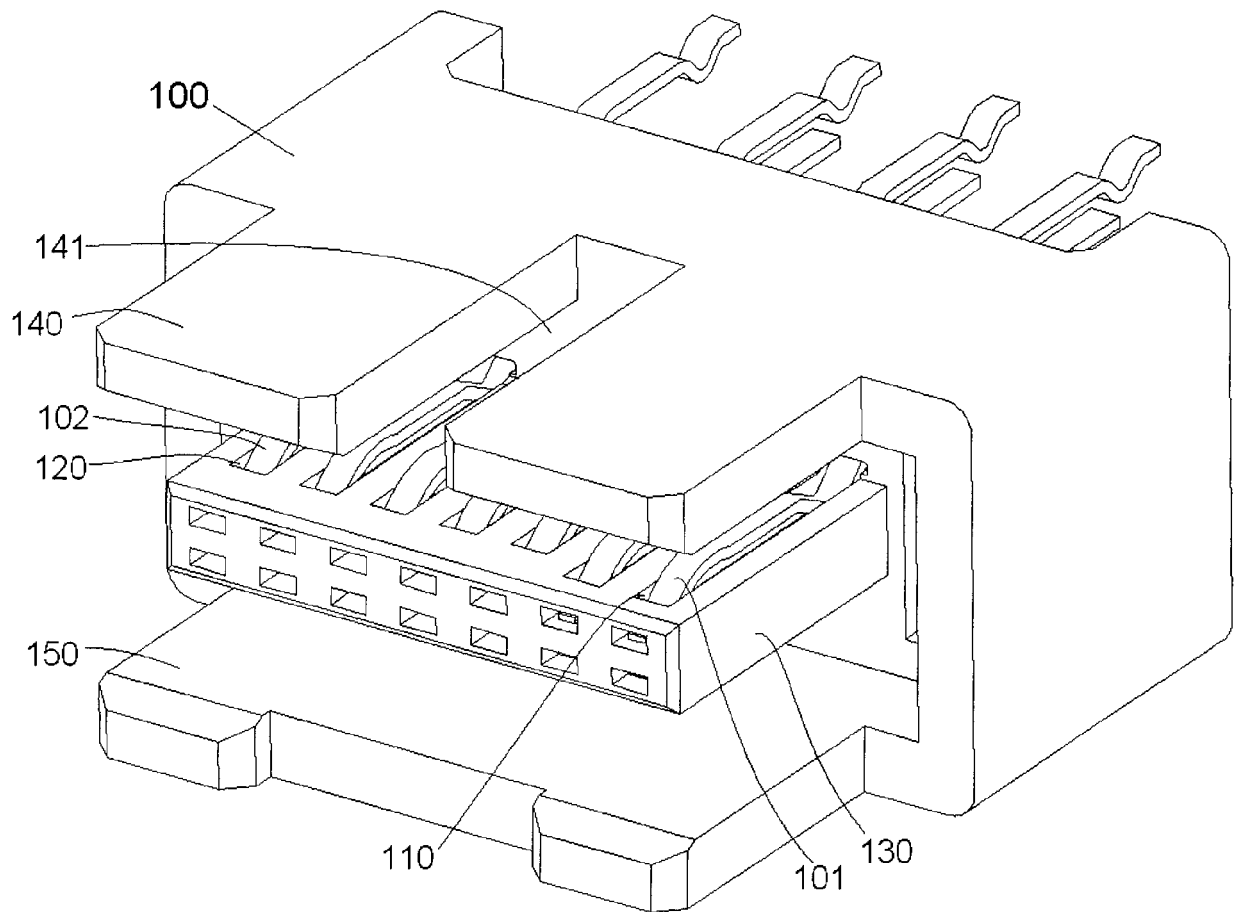


Fig. 3

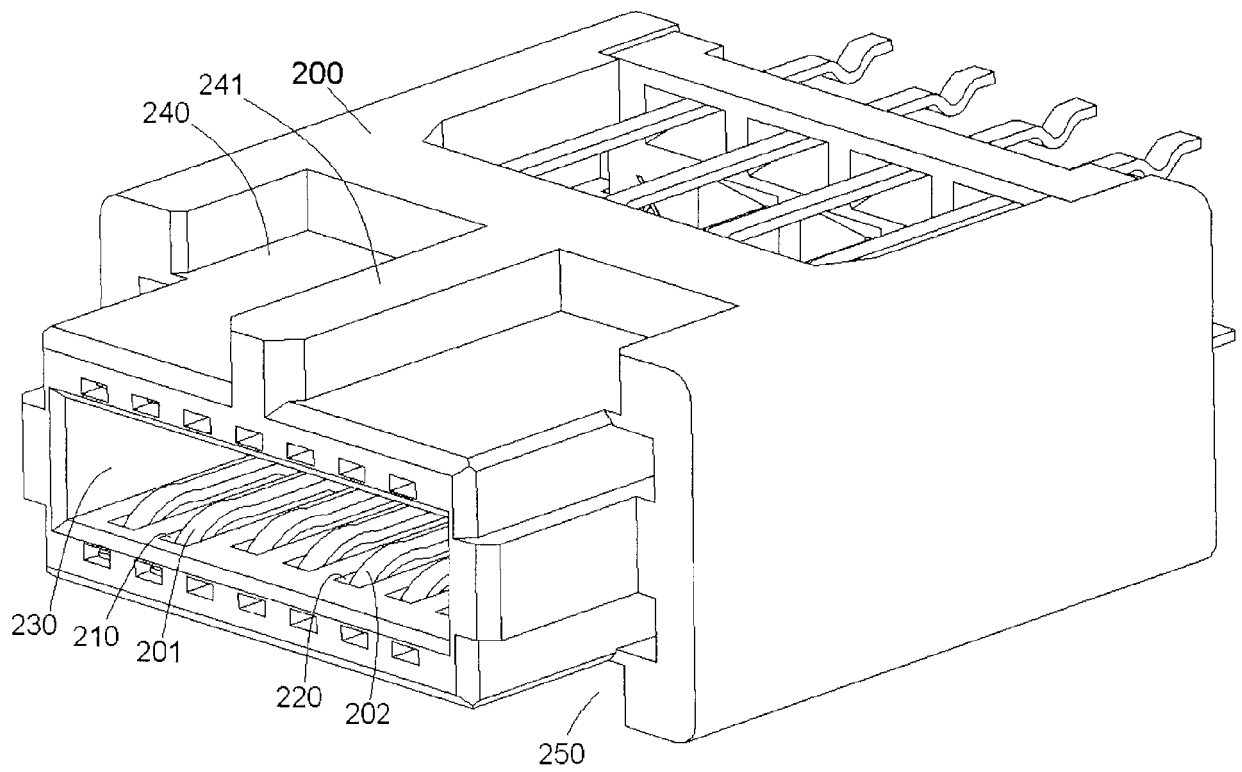


Fig. 4

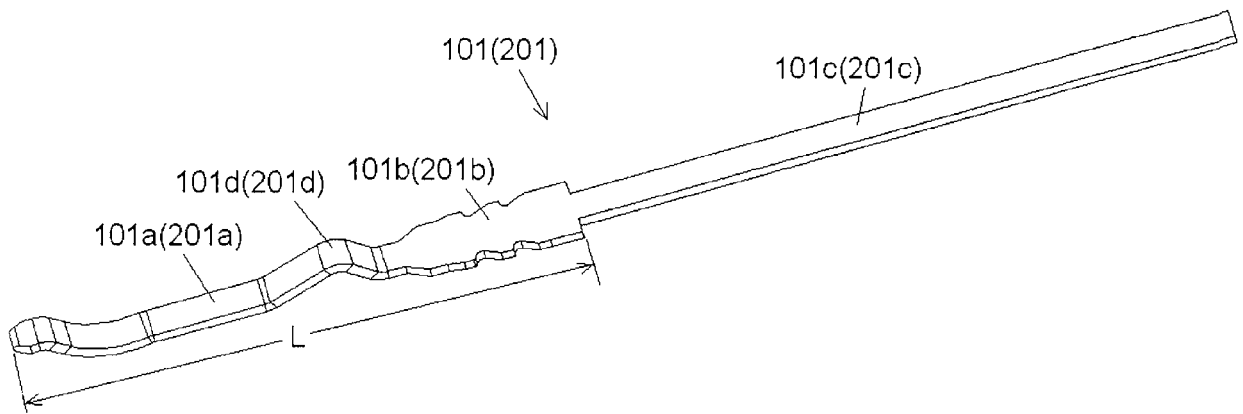


Fig. 5

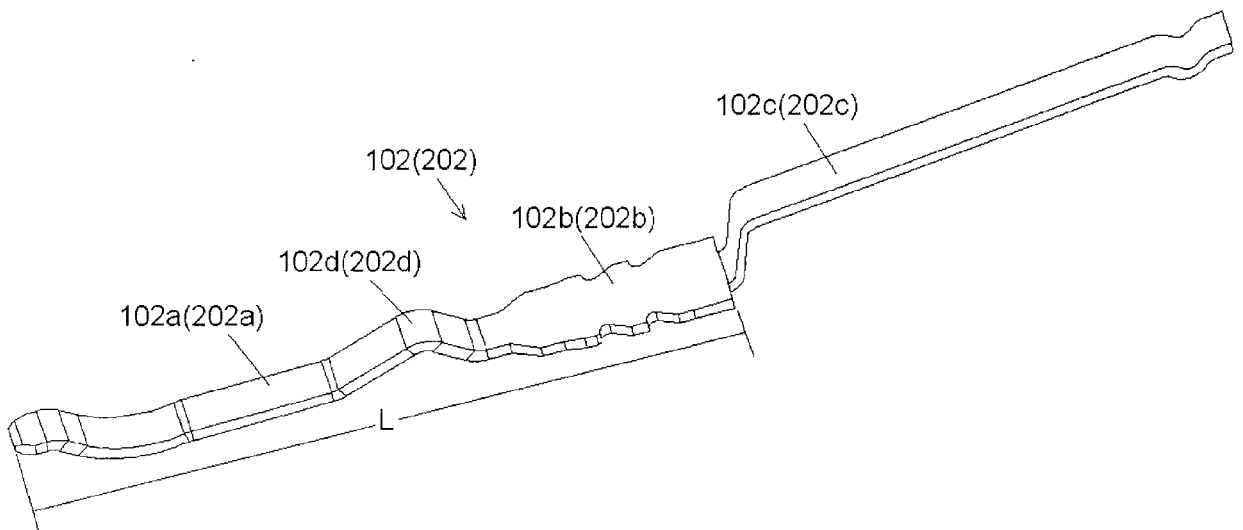


Fig. 6

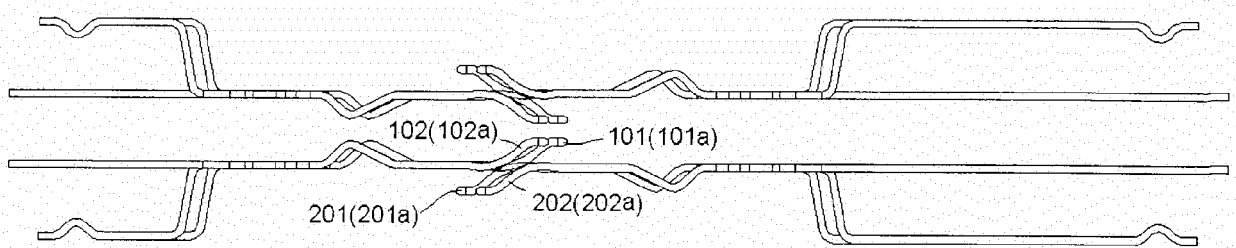


Fig. 7

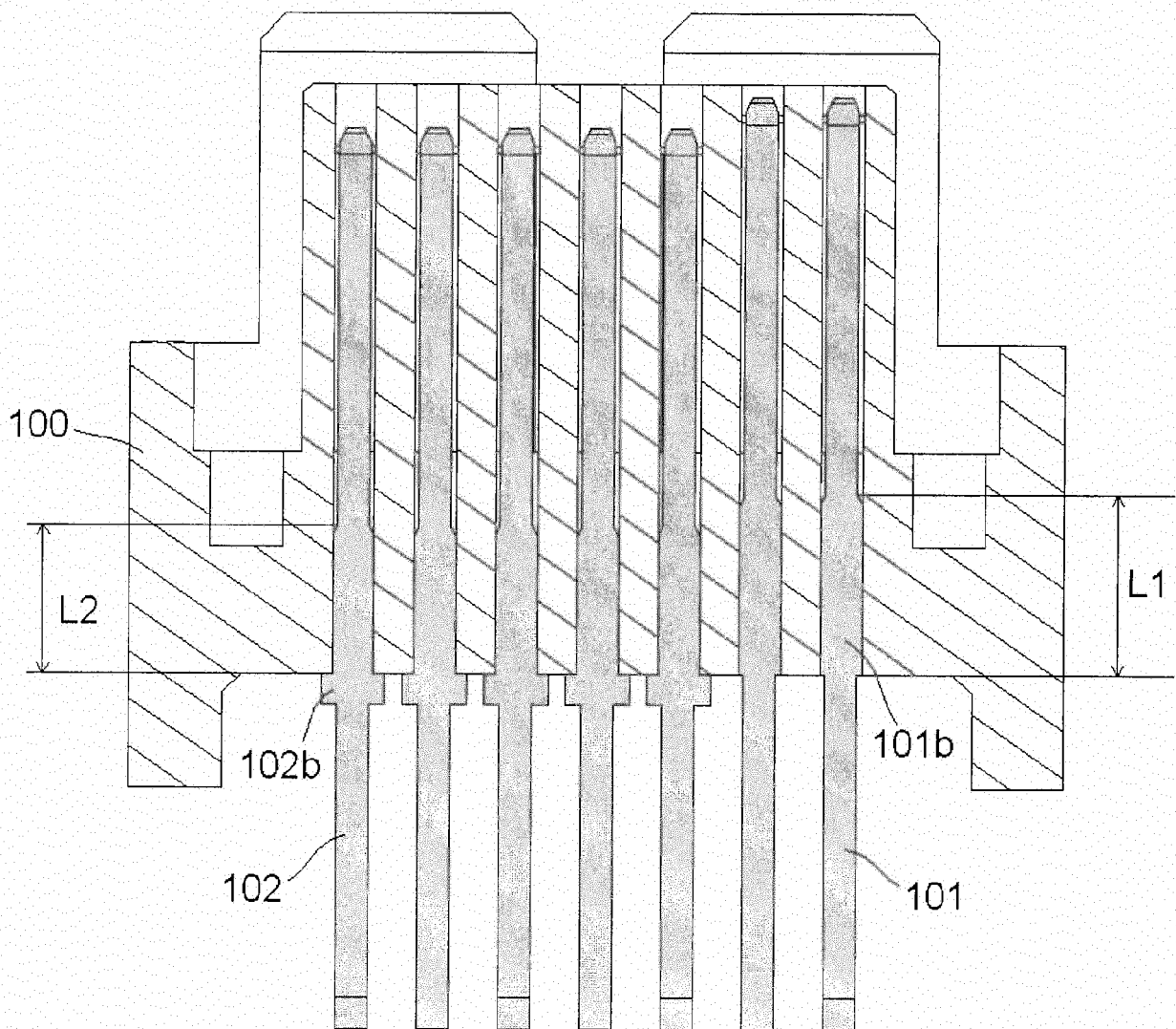


Fig. 8

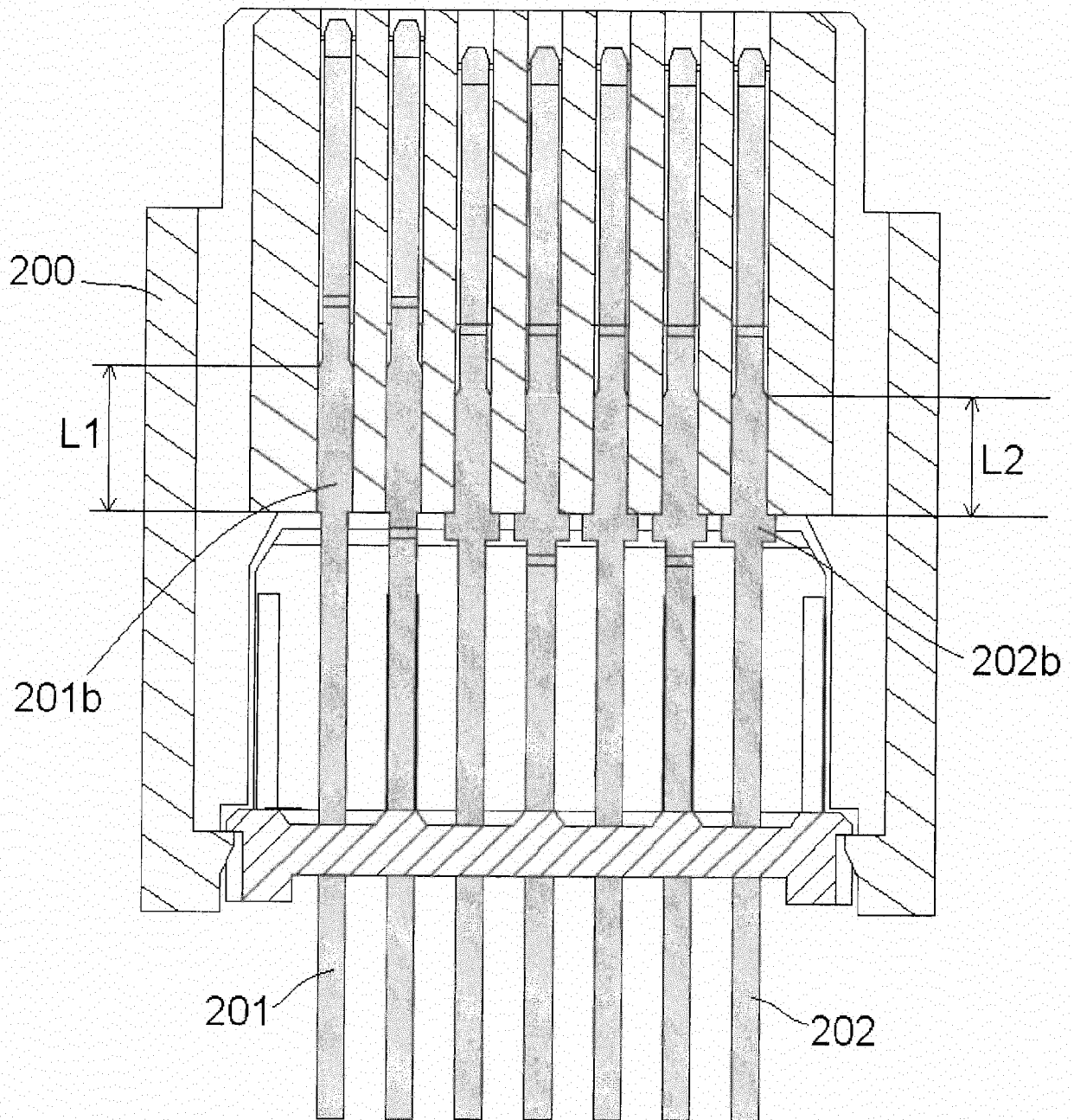


Fig. 9



EUROPEAN SEARCH REPORT

Application Number
EP 16 18 2402

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Y	US 4 084 875 A (YAMAMOTO STEPHEN K) 18 April 1978 (1978-04-18) * abstract; figure 1 *	1-15	
A	CN 204 464 554 U (TYCO ELECTRONICS SHANGHAI CO) 8 July 2015 (2015-07-08) * figures 1,4 *	1,3-5	
A	EP 1 863 136 A2 (TYCO ELECTRONICS CORP [US]) 5 December 2007 (2007-12-05) * figure 3 *	1,15	
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			H01R
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 28 November 2016	Examiner Philippot, Bertrand
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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28-11-2016

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