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Meng et al.

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(54) **ELECTRICAL PLUG CONNECTOR, ELECTRICAL RECEPTACLE CONNECTOR, AND ELECTRICAL CONNECTOR ASSEMBLY HAVING THE SAME**

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H01R 12/73 (2011.01)
H01R 12/91 (2011.01)

(52) **U.S. Cl.**
CPC ***H01R 12/727*** (2013.01); ***H01R 12/732*** (2013.01); ***H01R 12/91*** (2013.01)

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CPC H01R 12/727; H01R 12/732; H01R 12/91; H01R 12/73
See application file for complete search history.

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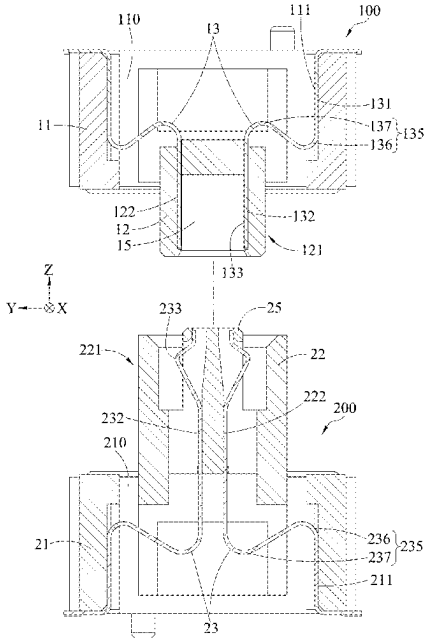
(57) **ABSTRACT**

An electrical connector assembly includes an electrical plug connector and an electrical receptacle connector corresponding to the electrical plug connector. The electrical plug connector includes a plug fixation housing, a plug movable housing, and plug terminals. The plug terminals are on the plug fixation housing, and the plug movable housing is floatingly arranged on the plug fixation housing. The electrical receptacle connector includes a receptacle fixation housing, a receptacle movable housing, and receptacle terminals. The receptacle terminals are on the receptacle fixation housing, and the receptacle movable housing is floatingly arranged on the receptacle fixation housing. An electrical plug connector and an electrical receptacle connector are also provided.

15 Claims, 7 Drawing Sheets



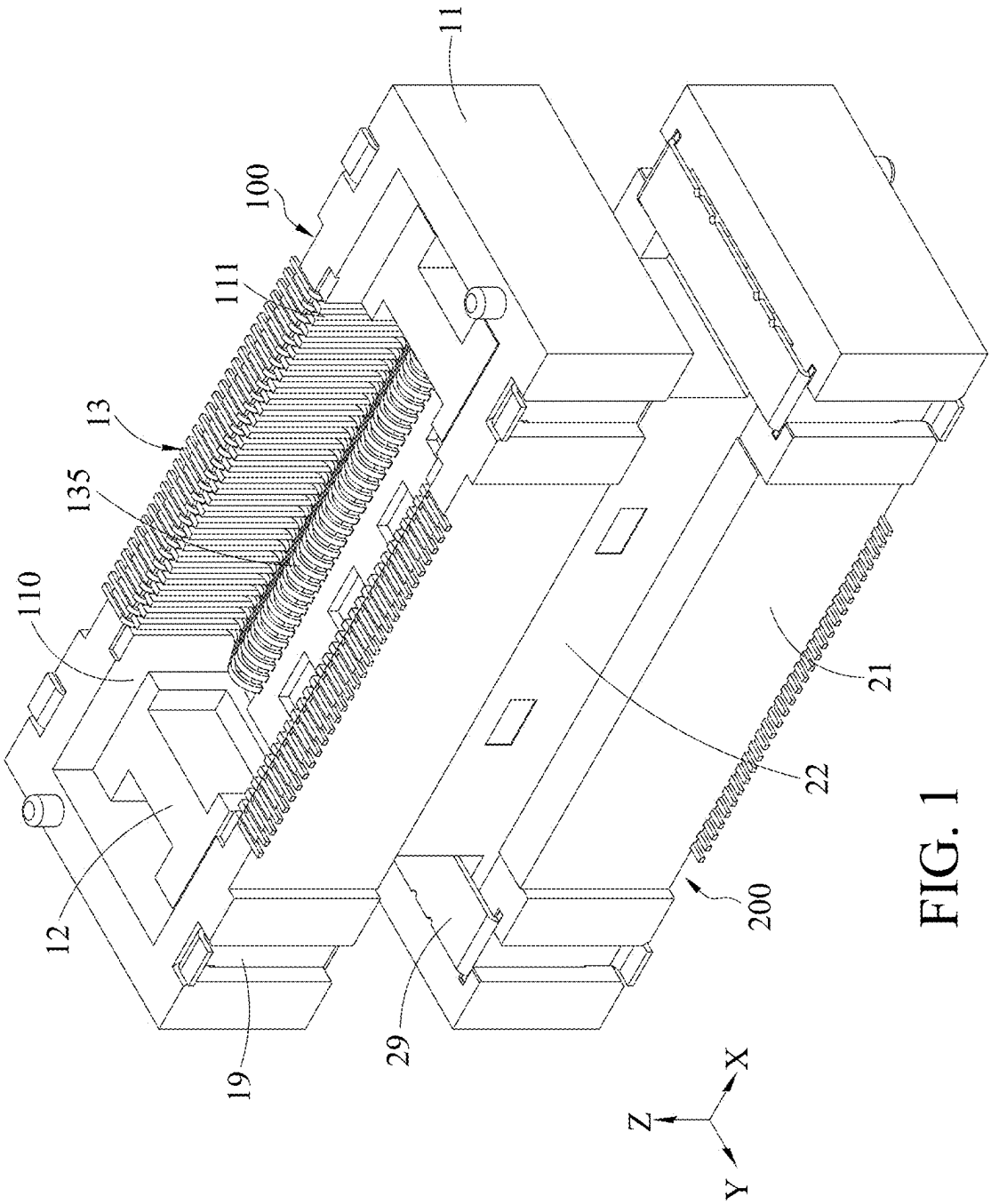


FIG. 1

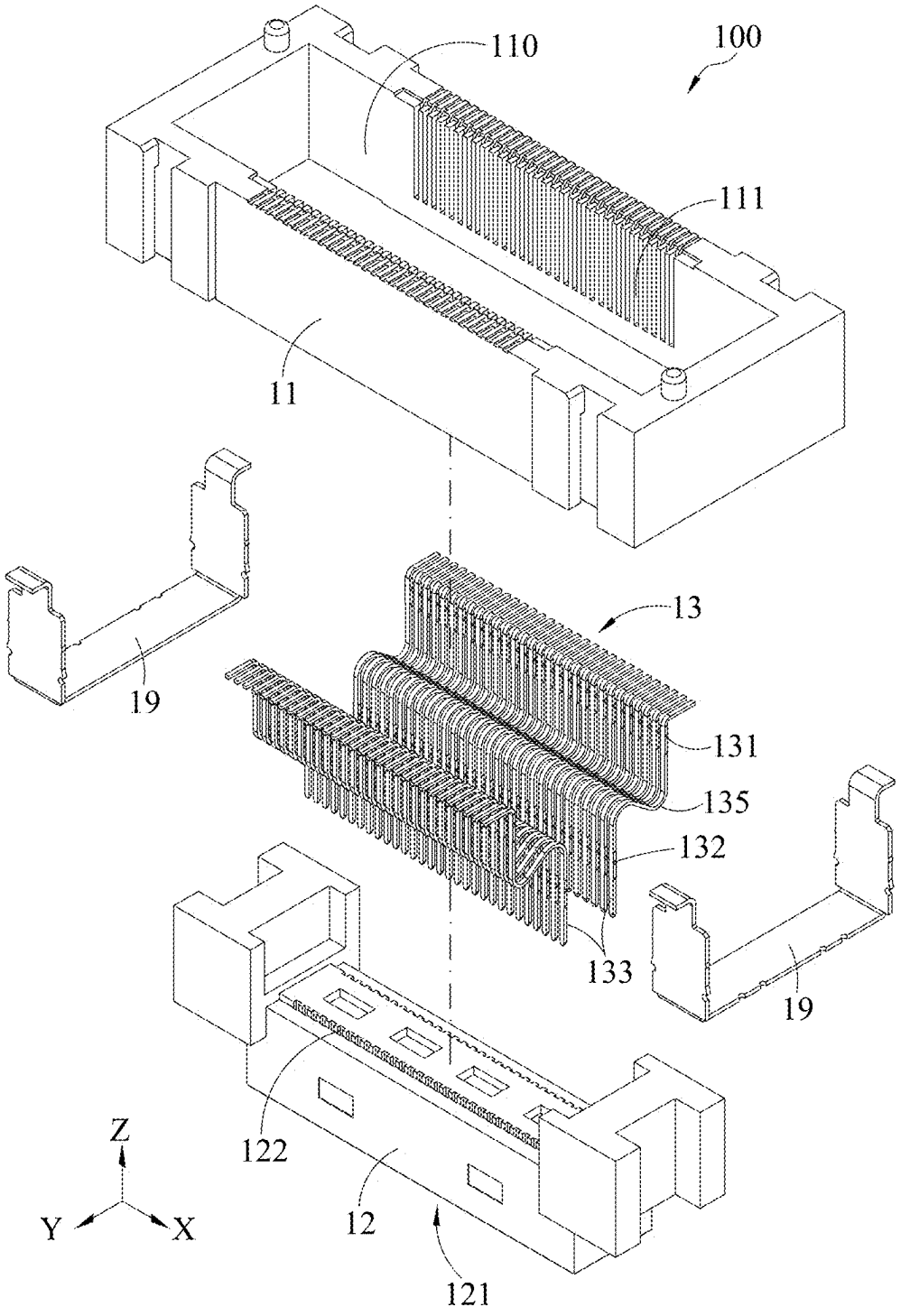


FIG. 2

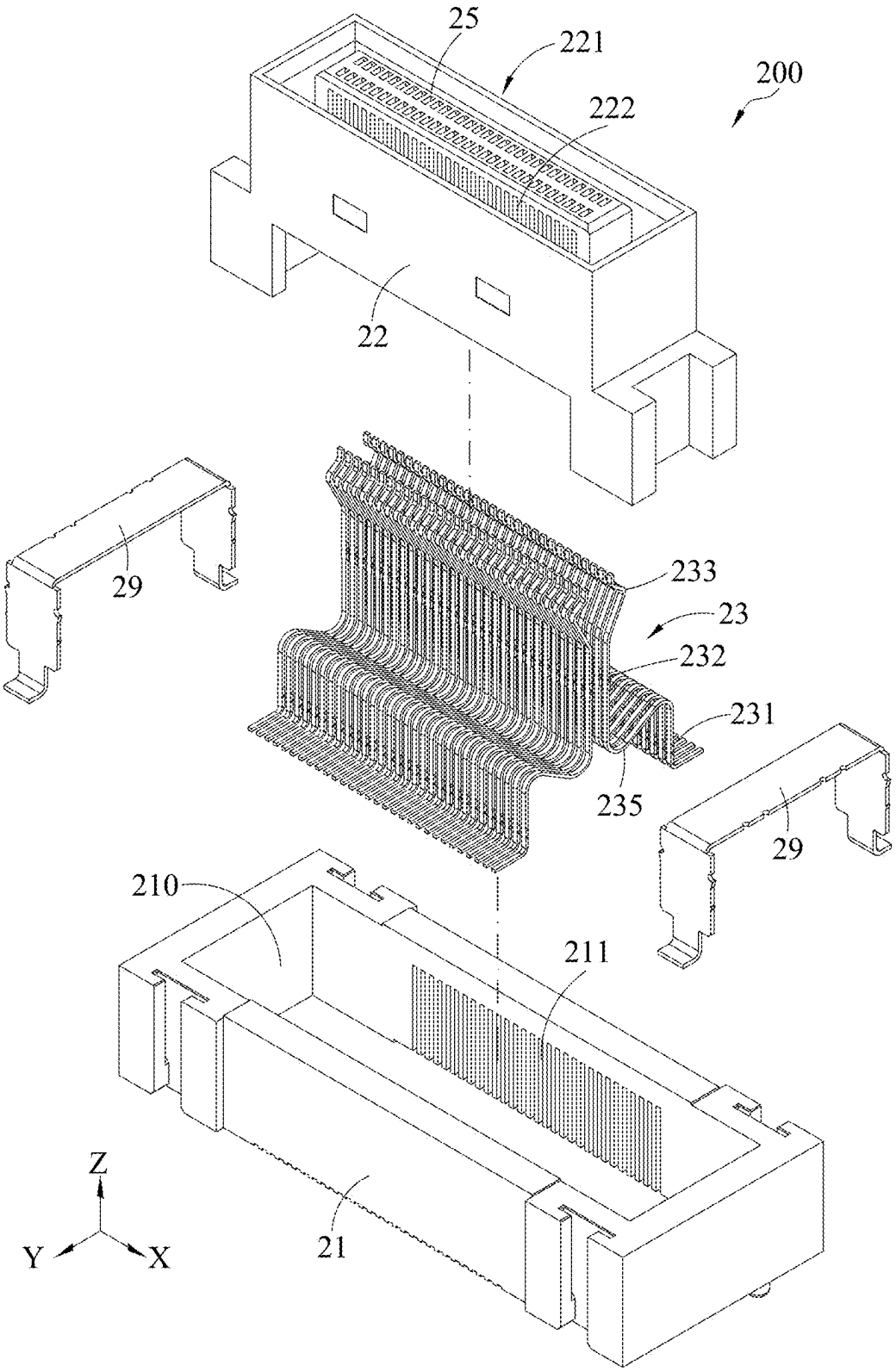


FIG. 3

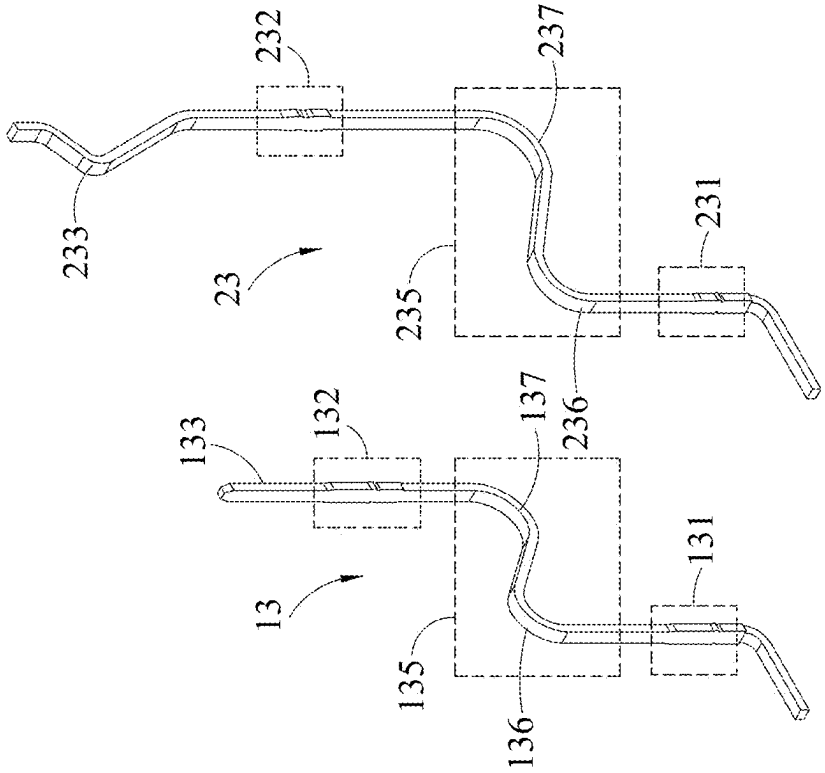


FIG. 4

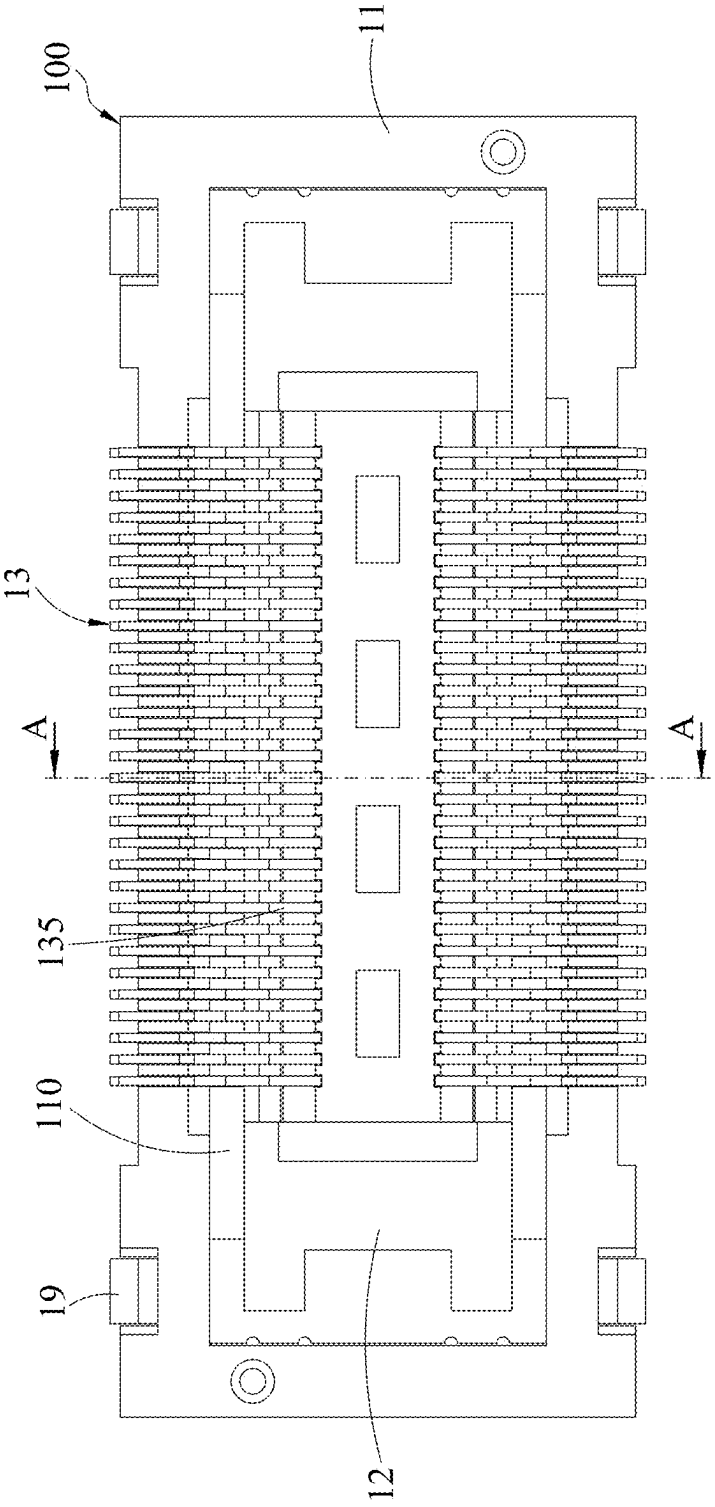


FIG. 5

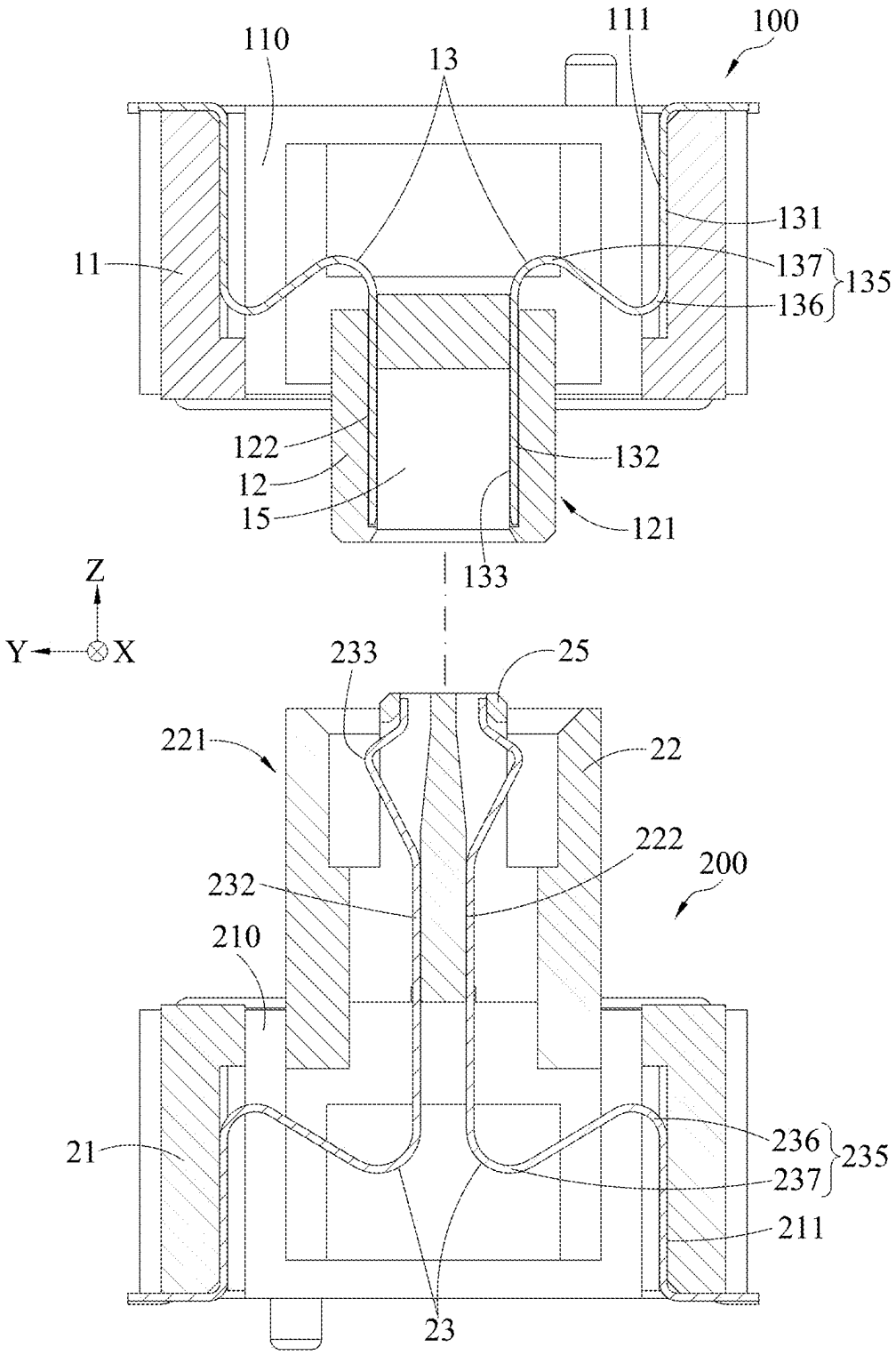

110
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FIG. 6

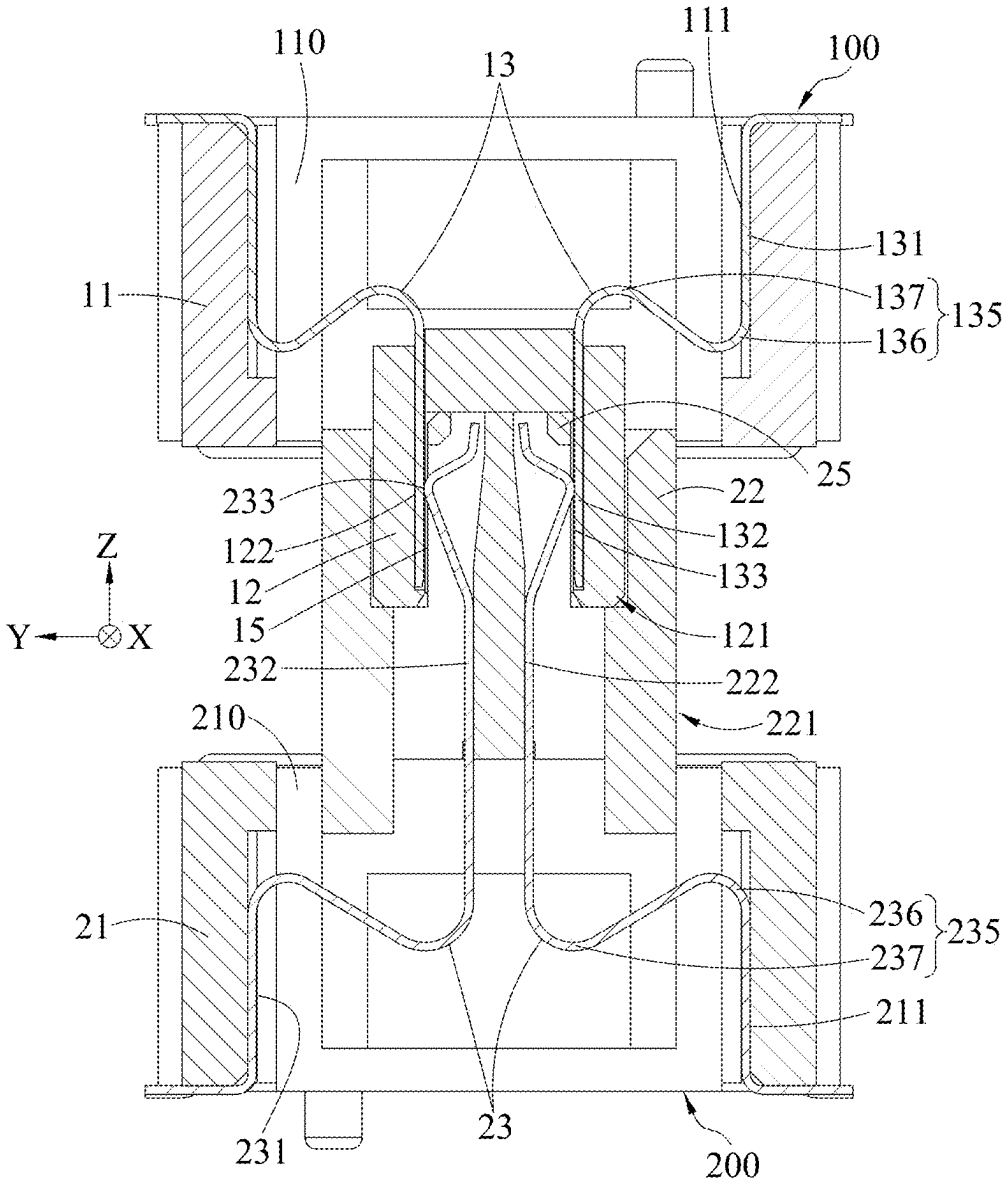
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FIG. 7

ELECTRICAL PLUG CONNECTOR, ELECTRICAL RECEPTACLE CONNECTOR, AND ELECTRICAL CONNECTOR ASSEMBLY HAVING THE SAME

CROSS-REFERENCE TO RELATED APPLICATION

This non-provisional application claims priority under 35 U.S.C. § 119(a) to Patent Application No. 202122895240.0 filed in China, P.R.C. on Nov. 24, 2021, the entire contents of which are hereby incorporated by reference.

FIELD OF THE INVENTION

The instant disclosure relates to an electrical connector assembly, and more particular to an electrical plug connector, an electrical receptacle connector, and a board-to-board electrical connector assembly comprising an electrical plug connector and an electrical receptacle connector.

BACKGROUND

The board-to-board (BTB) electrical connector is an electrical connector assembly. The electrical connector assembly comprises a plug connector and a receptacle connector corresponding to the plug connector. The plug connector is arranged with a plurality of male terminals. The receptacle connector is arranged with a plurality of female terminals. When plug first connector is inserted into the receptacle connector, the male terminals are mated with the female terminals to achieve the signal transmission between two printed circuit boards.

SUMMARY OF THE INVENTION

For a BTB electrical connector known to the inventor, the plug connector includes a plug fixation housing and fixation terminals, and the receptacle connector includes a receptacle fixation housing, a receptacle movable housing, and Z-shaped terminals, wherein the receptacle fixation housing and the receptacle movable housing are connected with each other through the Z-shaped terminals. After the plug connector is mated with the receptacle connector, the plug connector is in a fixed state and cannot be moved freely, and the receptacle connector is in a movable state. As a result, upon mating the plug connector with the receptacle connector, if the plug connector is not properly aligned with the receptacle connector, the plug connector cannot be adjusted to the correct mating orientation.

In view of this, an embodiment of the instant disclosure provides an electrical connector assembly. The electrical connector assembly comprises an electrical plug connector and an electrical receptacle connector. The electrical plug connector comprises a plug fixation housing, a plug movable housing, and a plurality of plug terminals. The plug fixation housing has a receiving space and a plurality of first terminal positioning grooves at two sides of the receiving space. The plug movable housing is in the receiving space. The plug movable housing has a plug mating portion and a plurality of second terminal positioning grooves at two sides of the plug mating portion, and the plug mating portion is exposed from the receiving space. Each of the plug terminals comprises a first fixation portion, a second fixation portion, and a plug contact portion. Each of the first fixation portions is positioned at a corresponding one of the first terminal positioning grooves, and each of the second fixation portions

is positioned at a corresponding one of the second terminal positioning grooves. In each of the plug terminals, the plug contact portion is adjacent to the second fixation portion. The electrical receptacle connector comprises a receptacle fixation housing, a receptacle movable housing, and a plurality of receptacle terminals. The receptacle fixation housing has a working space and a plurality of third terminal positioning grooves at two sides of the working space. The receptacle movable housing is in the working space. The receptacle movable housing has a receptacle mating portion and a plurality of fourth terminal positioning grooves at two sides of the receptacle mating portion, and the receptacle mating portion is exposed from the working space. Each of the third fixation portions is positioned at a corresponding one of the third terminal positioning grooves, and each of the fourth fixation portions is positioned at a corresponding one of the fourth terminal positioning grooves. In each of the receptacle terminals, the receptacle contact portion is adjacent to the fourth fixation portion.

In some embodiments, each of the plug terminals has a plug continuous bending portion between the first fixation portion and the second fixation portion, and the first fixation portion and the second fixation portion are at different horizontal axes.

In some embodiments, in each of the plug terminals, the plug continuous bending portion is S-shaped and has a first turning portion and a second turning portion, the first turning portion is adjacent to the first fixation portion, and the second turning portion is adjacent to the second fixation portion.

In some embodiments, each of the receptacle terminals has a receptacle continuous bending portion between the third fixation portion and the fourth fixation portion, and the third fixation portion and the fourth fixation portion are at different horizontal axes.

In some embodiments, in each of the receptacle terminals, the receptacle continuous bending portion is S-shaped and has a third turning portion and a fourth turning portion, the third turning portion is adjacent to the third fixation portion, and the fourth turning portion is adjacent to the fourth fixation portion.

In some embodiments, the plug mating portion of the plug movable housing has an insertion groove, the receptacle mating portion of the receptacle movable housing has a protrusion, and the protrusion is mated with the insertion groove.

In some embodiments, the plug contact portions of the plug terminals are at two sides of the insertion groove, and the receptacle contact portions of the receptacle terminals protrude from two sides of the protrusion.

In some embodiments, the electrical connector assembly further comprises a plurality of plug hold-down members, and the plug hold-down members are fixed on the plug fixation housing and limited at two sides of the plug movable housing.

In some embodiments, the electrical connector assembly further comprises a plurality of receptacle hold-down members, and the receptacle hold-down members are fixed on the receptacle fixation housing and limited at two sides of the receptacle movable housing.

In another embodiment, an electrical plug connector is provided. The electrical plug connector comprises a plug fixation housing, a plug movable housing, and a plurality of plug terminals. The plug fixation housing has a receiving space and a plurality of first terminal positioning grooves at two sides of the receiving space. The plug movable housing is in the receiving space, and the plug movable housing has

a plug mating portion and a plurality of second terminal positioning grooves at two sides of the plug mating portion, and the plug mating portion is exposed from the receiving space. Each of the plug terminals comprises a first fixation portion, a second fixation portion, and a plug contact portion. Each of the plug terminals is positioned at a corresponding one of the first terminal positioning grooves, and each of the second fixation portions is positioned at a corresponding one of the second terminal positioning grooves. In each of the plug terminals, the plug contact portion is adjacent to the second fixation portion.

In some embodiments, each of the plug terminals has a plug continuous bending portion between the first fixation portion and the second fixation portion, and the first fixation portion and the second fixation portion are at different horizontal axes.

In some embodiments, in each of the plug terminals, the plug continuous bending portion is S-shaped and has a first turning portion and a second turning portion, the first turning portion is adjacent to the first fixation portion, and the second turning portion is adjacent to the second fixation portion.

In some embodiments, the plug mating portion of the plug movable housing has an insertion groove, and the plug contact portions of the plug terminals are at two sides of the insertion groove.

In some embodiments, the electrical plug connector further comprises a plurality of plug hold-down members. The plug hold-down members are fixed on the plug fixation housing and limited at two sides of the plug movable housing.

In yet another embodiment, an electrical receptacle connector is provided. The electrical receptacle connector comprises a receptacle fixation housing, a receptacle movable housing, and a plurality of receptacle terminals. The receptacle fixation housing has a working space and a plurality of third positioning grooves at two sides of the working space. The receptacle movable housing is in the working space, and the receptacle movable housing has a receptacle mating portion and a plurality of fourth terminal positioning grooves at two sides of the receptacle mating portion, and the receptacle mating portion is exposed from the working space. Each of the receptacle terminals comprises a third fixation portion, a fourth fixation portion, and a receptacle contact portion. Each of the third fixation portions is positioned at a corresponding one of the third terminal positioning portions, and each of the fourth fixation portions is positioned at a corresponding one of the fourth terminal positioning grooves. In each of the receptacle terminals, the receptacle contact portion is adjacent to the fourth fixation portion.

In some embodiments, each of the receptacle terminals has a receptacle continuous bending portion between the third fixation portion and the fourth fixation portion, and the third fixation portion and the fourth fixation portion are at different horizontal axes.

In some embodiments, in each of the receptacle terminals, the receptacle continuous bending portion is S-shaped and has a third turning portion and a fourth turning portion, the third turning portion is adjacent to the third fixation portion, and the fourth turning portion is adjacent to the fourth fixation portion.

In some embodiments, the receptacle mating portion of the receptacle movable housing has a protrusion, and the receptacle contact portions of the receptacle terminals protrude from two sides of the protrusion.

In some embodiments, the electrical receptacle connector further comprises a plurality of receptacle hold-down members. The receptacle hold-down members are fixed on the receptacle fixation housing and limited at two sides of the receptacle movable housing.

Based on the above, according to one or some embodiments of the instant disclosure, the plug movable housing of the electrical plug connector and the receptacle movable housing of the electrical receptacle connector are mated with each other in a floating manner, thus allowing the electrical plug connector and the electrical receptacle connector to be mated with each other stably, and increasing the layout flexibility of the circuit boards soldered with the connector assembly.

Detailed description of the characteristics and the advantages of the instant disclosure are shown in the following embodiments. The technical content and the implementation of the instant disclosure should be readily apparent to any person skilled in the art from the detailed description, and the purposes and the advantages of the instant disclosure should be readily understood by any person skilled in the art with reference to content, claims, and drawings in the instant disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

The instant disclosure will become more fully understood from the detailed description given herein below for illustration only, and thus not limitative of the instant disclosure, wherein:

FIG. **1** illustrates a perspective view of an electrical connector assembly according to some embodiments of the instant disclosure;

FIG. **2** illustrates an exploded view of an electrical plug connector according to some embodiments of the instant disclosure;

FIG. **3** illustrates an exploded view of an electrical receptacle connector according to some embodiments of the instant disclosure;

FIG. **4** illustrates a perspective view of plug terminals and receptacle terminals according to some embodiments of the instant disclosure;

FIG. **5** illustrates a top schematic view of the electrical connector assembly according to some embodiments of the instant disclosure;

FIG. **6** illustrates a cross-sectional view of the portion A-A shown in FIG. **5**, where electrical plug connector is not mated with the electrical receptacle connector; and

FIG. **7** illustrates a cross-sectional view of the portion A-A shown in FIG. **5**, where electrical plug connector is mated with the electrical receptacle connector.

DETAILED DESCRIPTION

Please refer to FIG. **1**. FIG. **1** illustrates a perspective view of an electrical connector assembly according to some embodiments of the instant disclosure. The electrical connector assembly comprises an electrical plug connector **100** (plug) and an electrical receptacle connector **200** (receptacle), and the electrical connector assembly is a board-to-board (BTB) connector assembly.

Please refer to FIG. **2**. FIG. **2** illustrates an exploded view of an electrical plug connector **100** according to some embodiments of the instant disclosure. In this embodiment, the electrical plug connector **100** comprises a plug fixation housing **11**, a plug movable housing **12**, and a plurality of plug terminals **13**. The plug fixation housing **11** has a

receiving space **110** and a plurality of first terminal positioning grooves **111** at two sides of the receiving space **110**. The plug movable housing **12** is in the receiving space **110**. The plug movable housing **12** has a plug mating portion **121** and a plurality of second terminal positioning grooves **122** at two sides of the plug mating portion **121**, and the plug mating portion **121** is exposed from the receiving space **110**. Each of the plug terminals **13** comprises a first fixation portion **131**, a second fixation portion **132**, and a plug contact portion **133** (as shown in FIG. **4**). Each of the first fixation portions **131** is positioned at a corresponding one of the first terminal positioning grooves **111**, and each of the second fixation portions **132** is positioned at a corresponding one of the second terminal positioning grooves **122**. In each of the plug terminals **12**, the plug contact portion **133** is adjacent to the second fixation portion **132**.

Please refer to FIG. **3**. FIG. **3** illustrates an exploded view of an electrical receptacle connector **200** according to some embodiments of the instant disclosure. In this embodiment, the electrical receptacle connector **200** comprises a receptacle fixation housing **21**, a receptacle movable housing **22**, and a plurality of receptacle terminals **23**. The receptacle fixation **21** housing has a working space **210** and a plurality of third terminal positioning grooves **211** at two sides of the working space **210**. The receptacle movable housing **22** is in the working space **210**. The receptacle movable housing **22** has a receptacle mating portion **221** and a plurality of fourth terminal positioning grooves **222** at two sides of the receptacle mating portion **221**, and the receptacle mating portion **221** is exposed from the working space **210**. Each of the receptacle terminals **23** comprises a third fixation portion **231**, a fourth fixation portion **232**, and a receptacle contact portion **233** (as shown in FIG. **4**). Each of the third fixation portions **231** is positioned at a corresponding one of the third terminal positioning grooves **211**, and each of the fourth fixation portions **232** is positioned at a corresponding one of the fourth terminal positioning grooves **222**. In each of the receptacle terminals **23**, the receptacle contact portion **233** is adjacent to the fourth fixation portion **232**.

Please refer to FIG. **3**. The plug fixation housing **11** and the plug movable housing **12** are not in contact with each other, and the receptacle fixation housing **21** and the receptacle movable housing **22** are not in contact with each other. In the assembly of the electrical plug connector **100**, the plug fixation housing **11** and the plug movable housing **12** are connected with each other through the plug terminals **13**, and the plug movable housing **12** is at a middle portion of the plug fixation housing **11** in a floating manner (as shown in FIG. **5** and FIG. **6**). Likewise, in the assembly of the electrical receptacle connector **200**, the receptacle fixation housing **21** and the receptacle movable housing **22** are connected with each other through the receptacle terminals **23**, and the receptacle movable housing **22** is at a middle portion of the receptacle fixation housing **21** in a floating manner (as shown in FIG. **5** and FIG. **6**).

During the process of the mating between the electrical plug connector **100** and the electrical receptacle connector **200** (as shown in FIG. **6** and FIG. **7**), both the plug movable housing **12** and the receptacle movable housing **22** can have certain offsets along the X-axis direction, the Y-axis direction, and the Z-axis direction. Therefore, even if the plug movable housing **12** does not properly align with the receptacle movable housing **22**, the plug movable housing **12**, or the receptacle movable housing **22**, or both the plug movable housing **12** and the receptacle movable housing **22** can be adjusted with the offsets, so that the plug movable housing **12** can be mated with the receptacle movable housing **22** with a correct mating orientation. Hence, the coordination between the electrical plug connector **100** and the electrical receptacle connector **200** can be increased, and the mating flexibility of the electrical connector assembly can be achieved.

The plug movable housing **12** is floatingly connected to the plug fixation housing **11** through the plug terminals **13** (as shown in FIG. **5** and FIG. **6**), and the plug terminals **13** have a higher elasticity. Likewise, the receptacle movable housing **22** is floatingly connected to the receptacle fixation housing **21** through the receptacle terminals **23**, and the receptacle terminals **23** have a higher elasticity. Hence, during the process of the mating between the electrical plug connector **100** and the electrical receptacle connector **200**, a portion of the stress (which occurs upon mating) can be absorbed by the plug terminals **13** and the receptacle terminals **23**, so that the stress at the soldering portions (the portions of the terminals soldering to the circuit boards) can be reduced, thus reducing the occurrence of the cracks between the soldering portions and the soldering spots on the circuit board.

As shown in FIG. **2**, in some embodiments, the plug fixation housing **11** is an elongated plastic member. The plug fixation housing **11** comprises a pair of first side walls and a pair of first end walls. The first side walls are opposite to and parallel with each other. The first end walls are opposite to and parallel with each other. The pair of the first side walls and the pair of the first end walls are enclosed to form the receiving space **110**.

As shown in FIG. **3**, in some embodiments, the receptacle fixation housing **21** is an elongated plastic member. The receptacle fixation housing **21** comprises a pair of second side walls and a pair of second end walls. The second side walls are opposite to and parallel with each other. The second end walls are opposite to and parallel with each other. The pair of the second side walls and the pair of the second end walls are enclosed to form the working space **210**.

Please refer to FIG. **6**. In some embodiments, the plug terminals **13** are disposed on the plug fixation housing **11** and are arranged into two rows opposite to each other. Each of the plug terminals **13** comprises a plug contact portion **133** (which is a plate-shaped structure; flat contact portion) and a plug tail portion. The plug contact portion **133** and the plug tail portion are integrally formed with each other. The plug contact portion **133** is arranged on the plug movable housing **12**, the plug tail portion extends out of the plug fixation housing **11** and soldered with a circuit board. The plug terminals **13** are provided for signal transmission or current transmission, where the current is between 0.3 A and 0.5 A.

Please refer to FIG. **6**. In some embodiments, the receptacle terminals **23** are disposed on the receptacle fixation housing **21** and are arranged into two rows opposite to each other. Each of the receptacle terminals **23** comprises a receptacle contact portion **233** (which is a protruding structure; elastic contact portion) and a receptacle tail portion. The receptacle contact portion **233** and the receptacle tail portion are integrally formed with each other. The receptacle contact portion **233** is arranged on the receptacle movable housing **22**, the receptacle tail portion extends out of the receptacle fixation housing **21** and soldered with a circuit board. The receptacle terminals **23** are provided for signal transmission or current transmission, where the current is between 0.3 A and 0.5 A.

Please refer to FIG. **4**. In some embodiments, each of the plug terminals **13** has a plug continuous bending portion **135**

between the first fixation portion **131** and the second fixation portion **132**, and the first fixation portion **131** and the second fixation portion **132** are at different horizontal axes. In each of the plug terminals **13**, the plug continuous bending portion **135** is S-shaped and has a first turning portion **136** and a second turning portion **137**, the first turning portion **136** is adjacent to the first fixation portion **131**, and the second turning portion **137** is adjacent to the second fixation portion **132**. For the plug contact portion **133**, a fixation region of the second fixation portion **132** is fixed with the plug movable housing **12**, and a fixation region of the first fixation portion **131** is fixed with the plug fixation housing **11**, so that the plug continuous bending portion **135** is floatingly arranged between the plug fixation housing **11** and the plug movable housing **12**. Moreover, please refer to FIGS. **6** and **7**, a height difference between the second turning portion **137** and the top portion **1311** of the first fixation portion **131**.

Please refer to FIG. **4**. In some embodiments, each of the receptacle terminals **23** has a receptacle continuous bending portion **235** between the third fixation portion **231** and the fourth fixation portion **232**, and the third fixation portion **231** and the fourth fixation portion **232** are at different horizontal axes. In each of the receptacle terminals **23**, the receptacle continuous bending portion **235** is S-shaped and has a third turning portion **236** and a fourth turning portion **237**, the third turning portion **236** is adjacent to the third fixation portion **231**, and the fourth turning portion **237** is adjacent to the fourth fixation portion **232**. For the receptacle contact portion **233**, a fixation region of the fourth fixation portion **232** is fixed with the receptacle movable housing **22**, and a fixation region of the third fixation portion **231** is fixed with the receptacle fixation housing **21**, so that the receptacle continuous bending portion **235** is floatingly arranged between the receptacle fixation housing **21** and the receptacle movable housing **22**. Moreover, please refer to FIGS. **6** and **7**, a height difference between the fourth turning portion **237** and the bottom portion **2311** of the third fixation portion **231**.

Please refer to FIG. **6**. In some embodiments, the plug mating portion **121** of the plug movable housing **12** has an insertion groove **15**, the receptacle mating portion **221** of the receptacle movable housing **22** has a protrusion **25**, and the protrusion **25** is mated with the insertion groove **15**.

Please refer to FIG. **6**. In some embodiments, the plug contact portions **133** of the plug terminals **13** are at two sides of the insertion groove **15**, and the receptacle contact portions **233** of the receptacle terminals **23** protrude from two sides of the protrusion **25**.

Please refer to FIG. **1**. In some embodiments, the electrical connector assembly further comprises a plurality of plug hold-down members **19**. Each of the plug hold-down members **19** is of an inverse U-shaped plate structure. The plug hold-down members **19** are fixed on the plug fixation housing **11** and limited at two sides of the plug movable housing **12**. Therefore, the plug movable housing **12** can be prevented from being detached from the plug fixation housing **11**. The plug hold-down members **19** (such as metallic shells) on the plug fixation housing **11** limit the lateral movement of the plug movable housing **12** along the Z-axis direction. When the electrical plug connector **100** is detached from the electrical receptacle connector **200**, the plug hold-down members **19** can effectively prevent the plug movable housing **12** from being closely held with the electrical receptacle connector **200** and thus detached from the plug fixation housing **11**, which will cause the damage or malfunction of the product.

Please refer to FIG. **1**. In some embodiments, the electrical connector assembly further comprises a plurality of receptacle hold-down members **29**. Each of the receptacle hold-down members **29** is of an inverse U-shaped plate structure. The receptacle hold-down members **29** are fixed on the receptacle fixation housing **21** and limited at two sides of the receptacle movable housing **22**. Therefore, the receptacle movable housing **22** can be prevented from being detached from the receptacle fixation housing **21**. The receptacle hold-down members **29** (such as metallic shells) on the receptacle fixation housing **21** limit the lateral movement of the receptacle movable housing **22** along the Z-axis direction. When the electrical plug connector **100** is detached from the electrical receptacle connector **200**, the receptacle hold-down members **29** can effectively prevent the receptacle movable housing **22** from being closely held with the electrical plug connector **100** and thus detached from the receptacle fixation housing **21**, which will cause the damage or malfunction of the product.

Based on the above, according to one or some embodiments of the instant disclosure, the plug movable housing of the electrical plug connector and the receptacle movable housing of the electrical receptacle connector are mated with each other in a floating manner, thus allowing the electrical plug connector and the electrical receptacle connector to be mated with each other stably, and increasing the layout flexibility of the circuit boards soldered with the connector assembly.

While the instant disclosure has been described by the way of example and in terms of the preferred embodiments, it is to be understood that the invention need not be limited to the disclosed embodiments. On the contrary, it is intended to cover various modifications and similar arrangements included within the spirit and scope of the appended claims, the scope of which should be accorded the broadest interpretation so as to encompass all such modifications and similar structures.

What is claimed is:

1. An electrical connector assembly, comprising:

an electrical plug connector comprising:

a plug fixation housing having a receiving space and a plurality of first terminal positioning grooves at two sides of the receiving space;

a plug movable housing in the receiving space, wherein the plug movable housing has a plug mating portion and a plurality of second terminal positioning grooves at two sides of the plug mating portion, and the plug mating portion is exposed from the receiving space; and

a plurality of plug terminals, wherein each of the plug terminals comprises a first fixation portion, a second fixation portion, a plug contact portion, and a plug continuous bending portion; each of the first fixation portions is positioned at a corresponding one of the first terminal positioning grooves, and each of the second fixation portions is positioned at a corresponding one of the second terminal positioning grooves; in each of the plug terminals, the plug contact portion is adjacent to the second fixation portion, and the plug continuous bending portion is between the first fixation portion and the second fixation portion, and the first fixation portion and the second fixation portion are at different horizontal axes, and the plug continuous bending portion is floatingly arranged between the plug fixation housing and the plug movable housing; and

an electrical receptacle connector comprising:

a receptacle fixation housing having a working space and a plurality of third terminal positioning grooves at two sides of the working space;

a receptacle movable housing in the working space, wherein the receptacle movable housing has a receptacle mating portion and a plurality of fourth terminal positioning grooves at two sides of the receptacle mating portion, and the receptacle mating portion is exposed from the working space; and

a plurality of receptacle terminals, wherein each of the receptacle terminals comprises a third fixation portion, a fourth fixation portion, a receptacle contact portion and a receptacle continuous bending portion; each of the third fixation portions is positioned at a corresponding one of the third terminal positioning grooves, and each of the fourth fixation portions is positioned at a corresponding one of the fourth terminal positioning grooves; in each of the receptacle terminals, the receptacle contact portion is adjacent to the fourth fixation portion, the receptacle continuous bending portion is between the third fixation portion and the fourth fixation portion, and the third fixation portion and the fourth fixation portion are at different horizontal axes, and the receptacle continuous bending portion is floatingly arranged between the receptacle fixation housing and the receptacle movable housing;

wherein the plug movable housing is floatingly arranged on the plug fixation housing.

2. The electrical connector assembly according to claim **1**, wherein in each of the plug terminals, the plug continuous bending portion is S-shaped and has a first turning portion and a second turning portion, the first turning portion is adjacent to the first fixation portion, and the second turning portion is adjacent to the second fixation portion, and wherein a height difference between the second turning portion and the top portion of the first fixation portion.

3. The electrical connector assembly according to claim **1**, wherein in each of the receptacle terminals, the receptacle continuous bending portion is S-shaped and has a third turning portion and a fourth turning portion, the third turning portion is adjacent to the third fixation portion, and the fourth turning portion is adjacent to the fourth fixation portion, and wherein a height difference is between the fourth turning portion and the bottom portion of the third fixation portion.

4. The electrical connector assembly according to claim **1**, wherein the plug mating portion of the plug movable housing has an insertion groove, the receptacle mating portion of the receptacle movable housing has a protrusion, and the protrusion is mated with the insertion groove.

5. The electrical connector assembly according to claim **4**, wherein the plug contact portions of the plug terminals are at two sides of the insertion groove, and the receptacle contact portions of the receptacle terminals protrude from two sides of the protrusion.

6. The electrical connector assembly according to claim **1**, further comprising a plurality of plug hold-down members, wherein the plug hold-down members are fixed on the plug fixation housing and limited at two sides of the plug movable housing.

7. The electrical connector assembly according to claim **1**, further comprising a plurality of receptacle hold-down members, wherein the receptacle hold-down members are fixed on the receptacle fixation housing and limited at two sides of the receptacle movable housing.

8. An electrical plug connector, comprising:

a plug fixation housing having a receiving space and a plurality of first terminal positioning grooves at two sides of the receiving space;

a plug movable housing in the receiving space, wherein the plug movable housing has a plug mating portion and a plurality of second terminal positioning grooves at two sides of the plug mating portion, and the plug mating portion is exposed from the receiving space; and

a plurality of plug terminals, wherein each of the plug terminals comprises a first fixation portion, a second fixation portion, and a plug contact portion, and a plug continuous bending portion; wherein each of the first fixation portions is positioned at a corresponding one of the first terminal positioning grooves, and each of the second fixation portions is positioned at a corresponding one of the second terminal positioning grooves; in each of the plug terminals, the plug contact portion is adjacent to the second fixation portion, and the plug continuous bending portion is between the first fixation portion and the second fixation portion, and the first fixation portion and the second fixation portion are at different horizontal axes, and the plug continuous bending portion is floatingly arranged between the plug fixation housing and the plug movable housing.

9. The electrical plug connector according to claim **8**, wherein in each of the plug terminals, the plug continuous bending portion is S-shaped and has a first turning portion and a second turning portion, the first turning portion is adjacent to the first fixation portion, and the second turning portion is adjacent to the second fixation portion, and wherein a height difference between the second turning portion and the top portion of the first fixation portion.

10. The electrical plug connector according to claim **8**, wherein the plug mating portion of the plug movable housing has an insertion groove, and the plug contact portions of the plug terminals are at two sides of the insertion groove.

11. The electrical plug connector according to claim **8**, further comprising a plurality of plug hold-down members, wherein the plug hold-down members are fixed on the plug fixation housing and limited at two sides of the plug movable housing.

12. An electrical receptacle connector, comprising:

a receptacle fixation housing having a working space and a plurality of third terminal positioning grooves at two sides of the working space;

a receptacle movable housing in the working space, wherein the receptacle movable housing has a receptacle mating portion and a plurality of fourth terminal positioning grooves at two sides of the receptacle mating portion, and the receptacle mating portion is exposed from the working space; and

a plurality of receptacle terminals, wherein each of the receptacle terminals comprises a third fixation portion, a fourth fixation portion, a receptacle contact portion and receptacle continuous bending portion; each of the third fixation portions is positioned at a corresponding one of the third terminal positioning grooves, and each of the fourth fixation portions is positioned at a corresponding one of the fourth terminal positioning grooves; in each of the receptacle terminals, the receptacle contact portion is adjacent to the fourth fixation portion, the receptacle continuous bending portion is between the third fixation portion and the fourth fixation portion, and the third fixation portion and the fourth fixation portion are at different horizontal axes, and the receptacle continuous bending portion is float-

ingly arranged between the receptacle fixation housing and the receptacle movable housing.

13. The electrical receptacle connector according to claim **12**, wherein in each of the receptacle terminals, the receptacle continuous bending portion is S-shaped and has a third turning portion and a fourth turning portion, the third turning portion is adjacent to the third fixation portion, and the fourth turning portion is adjacent to the fourth fixation portion and wherein a height difference is between the fourth turning portion and the bottom portion of the third fixation portion.

14. The electrical receptacle connector according to claim **12**, wherein the receptacle mating portion of the receptacle movable housing has a protrusion, and the receptacle contact portions of the receptacle terminals protrude from two sides of the protrusion.

15. The electrical receptacle connector according to claim **12**, further comprising a plurality of receptacle hold-down members, wherein the receptacle hold-down members are fixed on the receptacle fixation housing and limited at two sides of the receptacle movable housing.

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