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(54) **CONNECTOR**

(57) A connector includes a first terminal and a second terminal. A spacer plate is arranged inside the first terminal. A plurality of guide flanges is arranged on the spacer plate. A plurality of first sleeves is mounted on the spacer plate. Two plug inserts are provided and separated by the spacer plate. Two plug insert sockets are arranged inside the second terminal. Each of the plug insert sockets is provided with a second sleeve. A guide groove which the spacer plate is able to be mounted in is arranged between the two plug insert sockets. Furthermore, a plurality of guide concave edges which are to be matched with the guide flanges is arranged in the guide groove. The guide groove is provided with a plurality of insertion pins. By assembling, the first terminal is to be inserted into the second terminal in such a way that the guide flanges and the guide concave edges match each other, which guides the two terminals to get combined. Furthermore, the plug inserts and the insertion pins are inserted into the first sleeves and the second sleeves respectively, which strengthens the structure of the connector. Thus, the parts of the connector can be positioned well and the structure of the connector can be greatly strengthened.

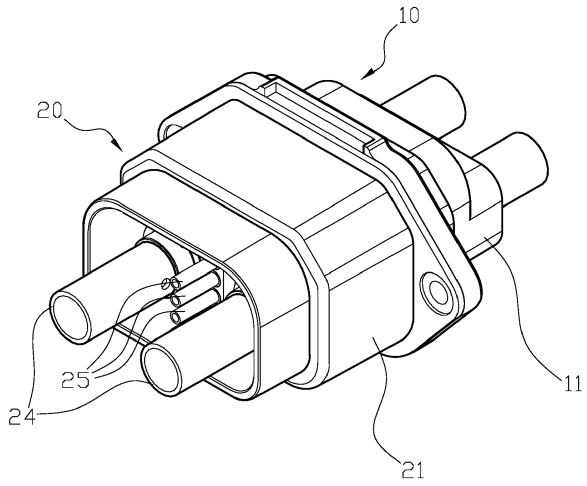

FIG. 1

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Description

BACKGROUND OF INVENTION

1. Field of Invention

[0001] The present invention relates to connectors, and more particularly to a connector at which an auxiliary positioning for combining parts better and the type of the terminals can be varied accordingly.

2. Description of the Related Art

[0002] Connectors are used for power or signal transmission and act an important part in connecting pins of control units and connecting current sources. On some occasions, machines using connectors might be shaken vehemently and thus vibrate. For instances, the connection quality in an electrical vehicle may be impacted when the electrical vehicle is tossed on a bumpy road. To enhance the connection quality, it is for example advisable to ensure a firm connection of two terminals.

[0003] Connectors are usually used for transmitting large or small currents. Thus, correspondent terminals of different types are applied. The type of terminals for connectors is selected according to the purpose of transmitting signals of large and/or small currents. For this reason, different production lines should be built up, which causes high production costs.

SUMMARY OF THE INVENTION

[0004] An objective of present invention is to provide a connector with which the deficiencies described above in the prior art can be eliminated.

[0005] To achieve these and other objects of the present invention, a connector is provided. The connector includes a first terminal and a second terminal. The first terminal has a first base. A signal mount and a spacer plate are arranged inside the first base of the first terminal. A plurality of guide flanges is arranged on the spacer plate. A plurality of first sleeves is mounted on the spacer plate. Two plug inserts are mounted on the first base in such a way that they are separated by the spacer plate. The second terminal has a second base. A signal socket outlet and two plug insert sockets are arranged inside the second base of the second terminal in such a way that they are connected with each other. Each of the plug insert sockets is provided with a second sleeve. A guide groove which the spacer plate is able to be mounted in is arranged between the two plug insert sockets. Furthermore, a plurality of guide concave edges which are to be matched with the guide flanges is arranged in the guide groove. The guide groove is provided with a plurality of insertion pins. By assembling, the first base of the first terminal is to be inserted into the second base of the second terminal in such a way that the plug inserts are inserted into the first sleeves and the spacer plate is received by the guide groove fittingly. The guide flanges and the guide concave edges act together and thereby conduct the insertion of the spacer plate into the guide groove. This facilitates the insertion of the insertion pins into the first sleeves. Thus, the connector is assembled.

[0006] Furthermore, a plurality of signal pins is mounted on the signal mount and a plurality of signal receptacles are mounted on the signal insert socket. By inserting the first base of the first terminal in the second base of the second terminal, the signal pins will be inserted into the signal receptacles, facilitating a connection of the signal pins and the signal receptacles with a current source. Thus, small currents or signals can be transmitted via the connector.

[0007] Preferably, a wave-shaped elastic band is further pulled around the outside of the first base. When the first base of the first terminal is inserted in the second base of the second terminal, the elastic band abuts on the internal surface of the second base, achieving an anti-slip and waterproof effect.

[0008] It is optional that the insertion pin and the first sleeve are formed as a terminal for small currents and a port for the terminal.

[0009] It is optional that the insertion pin and the first sleeve are formed as a slim axis and a sleeve element which fit into each other.

[0010] It is optional that the plug insert and the second sleeve are formed as a terminal for large currents and a port for the terminal.

[0011] It is optional that the plug insert and the second sleeve are formed as a thick axis and a sleeve element which fit into each other.

[0012] By matching the guide flanges and the guide concave edges with each other, the two terminals will be guided to get combined. Furthermore, the plug inserts and the insertion pins will be inserted into the first sleeves and the second sleeves respectively, which strengthens the structure of the connector. Thus, the parts of the connector can be positioned well and the structure of the connector can be greatly strengthened. The types of the plug inserts and the insertion pins will be determined according to the desired function of the terminals. For example, the terminals may be used to transmit currents or act as elements for strengthening the structure of the whole connector. Thus, the type of the terminals can be accordingly varied in the production process of the connector.

[0013] Other objects, advantages, and novel features of invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION of DRAWINGS

[0014]

FIG. 1 is a perspective view of the first preferred embodiment of a connector according to the present

invention.

FIG. 2 is an explosive view of the connector in FIG. 1.

FIG. 3 is an explosive view of the second terminal of the connector in FIG. 1.

FIG. 4 is an explosive view of the first terminal of the connector in FIG. 1.

FIG. 5 is a top view and sectional view of the connector in FIG. 1, showing the first terminal and the second terminal in a not-combined state.

FIG. 6 is a top view and sectional view of the connector in FIG. 1, showing the first terminal and the second terminal in a combined state.

FIG. 7 is a side view and sectional view of the connector in FIG. 1.

FIG. 8 is a front view and sectional view of the connector in FIG. 1.

FIG. 9 is an explosive view of the second preferred embodiment of a connector according to the present invention.

FIG. 10 is a side view and sectional view of the connector in FIG. 9.

FIG. 11 is an explosive view of the first terminal of the third preferred embodiment of a connector according to the present invention.

FIG. 12 is a side view and sectional view of the connector in FIG. 11.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0015] First, please refer to FIG. 1 to FIG. 4, a connector according to the invention has a first terminal 10 and a second terminal 20. The first terminal 10 possesses a first base 11. A signal mount 12 and a spacer plate 13 are arranged inside the first base 11 of the first terminal 10. A plurality of guide flanges 131 is arranged on the spacer plate 13. A plurality of first sleeves 14 is mounted on the spacer plate 13. Two plug inserts 15 are mounted on the first base 11 in such a way that they are separated by the spacer plate 13. The second terminal 20 has a second base 21. A signal socket outlet 22 and two plug insert sockets 23 are arranged inside the second base 21 of the second terminal 20 in such a way that they are connected with each other. Each of the plug insert sockets 23 is provided with a second sleeve 24. A guide groove 231 which the spacer plate 13 is able to be mounted in is arranged between the two plug insert sockets 23. Furthermore, a plurality of guide concave edges 2311 which are to be matched with the guide flanges 131 is arranged in the guide groove 231. The guide groove 231 is provided with a plurality of insertion pins 25.

[0016] Please refer to FIG. 5 to FIG. 8. By assembling, the first base 11 of the first terminal 10 is to be inserted into the second base 21 of the second terminal 20 in such a way that the plug inserts 15 are inserted into the first sleeves 24 and the spacer plate 13 is received by the guide groove 231 fittingly. The guide flanges 131 and the guide concave edges 2311 act together and thereby conduct the insertion of the spacer plate 13 into the guide groove 231. This facilitates the insertion of the insertion pins 25 into the first sleeves 14. Thus, the connector is assembled.

[0017] When the first terminal 10 and the second terminal 20 are combined with each other, the plug inserts 15 are inserted into the first sleeves 24 and the insertion pins 25 are inserted into the first sleeves 14 accordingly. With such a structure, the first terminal 10 and the second terminal 20 are connected with each other on at least three positions, which ensures a fixed, stable structure of the connector. The arrangement that the guide flanges 131 work together with the guide concave edges 2311 can also ensure a fixed, stable structure of the connector. Furthermore, the guide flanges 131 work together with the guide concave edges 2311, which can guide the insertion of the spacer plate 13 into the guide groove 231. Thus, an alleviated assembly of the connector can be achieved.

[0018] FIG. 9 und FIG. 10 show the second preferred embodiment of the connector according to the invention. The signal mount 12 is further provided with a plurality of signal pins 16. The signal socket outlet 22 is further provided with a plurality of signal receptacles 26. By inserting the first base 11 of the first terminal 10 into the second base 21 of the second terminal 20, the signal pins 16 are inserted into the signal receptacles 26 accordingly. Small currents or signals can be transmitted when the signal pins 16 and the signal receptacles 26 are connected to a current source.

[0019] The connector shown in FIG. 2 and FIG. 3 is formed in such a way that a wave-shaped elastic band 111 is further pulled around the outside of the first base 11. Please refer to FIG. 6 and FIG. 7. When the first base 11 of the first terminal 10 is inserted in the second base 21 of the second terminal 20, the elastic band 111 abuts on the internal surface of the second base 21, achieving an anti-slip and waterproof effect.

[0020] The connector shown in FIG. 1 to FIG. 4 is formed in such a way that the insertion pin 25 and the first sleeve 14 are formed as a terminal for small currents and a port for the terminal. Small currents or signals can be transmitted when the insertion pins 25 and the first sleeves 14 are connected to a current source.

[0021] Alternatively, the insertion pin 25 and the first sleeve 14 are formed as a slim axis and a sleeve element which fit into each other. This arrangement makes for guiding the combining of the parts and stabilizing the structure of the connector and is not electrically conductive.

[0022] The connector shown in FIG. 1 to FIG. 4 is formed in such a way that the plug insert 15 and the second sleeve 24 are formed as a terminal for large currents and a port for the terminal. Large currents can be transmitted when plug inserts 15 and the second sleeves 24 are connected to a current source.

[0023] FIG. 11 und FIG. 12 show the third preferred embodiment of the connector according to the invention.

The plug insert 15 and the second sleeve 24 are formed as a thick axis and a sleeve element which fit into each other. This arrangement makes for guiding the combining of the parts and stabilizing the structure of the connector and is not electrically conductive.

[0024] The connector shown in FIG. 11 and FIG. 12 is formed in such a way that a nonskid rim 151 is further arranged on the plug insert 15. By inserting the plug insert 15 into the second sleeve 24, the nonskid rim 151 abuts on the internal surface, achieving an anti-slip effect and preventing the first terminal 10 from loosening from the second terminal 20.

[0025] According to the invention, the inner diameter of the first sleeve 14 is smaller than 3mm. This arrangement is made to meet the standard IEC60335 so that a probe with a diameter of 3mm is not able to contact the first sleeve 14, which ensures a protection of children from an electric shock.

[0026] According to the invention, the spacer plate 13 and the guide groove 231 have a draft angle of 1° to 5° which ensures an effort-saving pulling and inserting of the first terminal 10 and the second terminal 20.

[0027] The connector has following benefits.

[0028] Firstly, when the plug inserts 15 are inserted into the first sleeves 24 and the insertion pins 25 are inserted into the first sleeves 14 accordingly, the first terminal 10 and the second terminal 20 are connected with each other on at least three positions, which ensures a fixed, stable structure of the connector.

[0029] Secondly, the arrangement that the guide flanges 131 work together with the guide concave edges 2311 can ensure a fixed, stable structure of the connector and furthermore guide the insertion of the spacer plate 13 into the guide groove 231. Thus, an alleviated assembly of the connector can be achieved.

[0030] Thirdly, it is possible to mount a plurality of signal pins 16 on the signal mount 12 and to mount a plurality of signal receptacles 26 on the signal socket outlet 22. It is also possible to mount additional pins for transmitting signals optionally if required. Thus, the construction of the connector can be varied flexibly in the production based on demand.

[0031] Fourthly, the insertion pin 25 and the first sleeve 14 are formed as a pair of terminals for small currents and are not electrically conductive. The insertion pin 25 and the first sleeve 14 serve thereby as connecting parts. The plug insert 15 and the second sleeve 24 are formed as a pair of terminals for large currents and are not electrically conductive. The plug insert 15 and the second sleeve 24 serve thereby as connecting parts. The type of the terminal is to be determined according to the intensity of the current in the production. Thereby, the production lines can be reduced so that a flexible, alleviated manufacturing is achievable.

[0032] Fifthly, the inner diameter of the first sleeve 14 is smaller than 3mm. This arrangement is made to meet the standard IEC60335 so that a probe with a diameter of 3mm is not able to contact the first sleeve 14, which ensures a protection of children from an electric shock.

[0033] Although the present invention has been explained in relation to its preferred embodiment, it is to be understood that many other possible modifications and variations can be made without departing from the spirit and scope of invention as hereinafter claimed.

Claims

1. A connector consisting of a first terminal and a second terminal, **characterized in**

   that the first terminal possesses a first base, a signal mount and a spacer plate are arranged inside the first base of the first terminal, a plurality of guide flanges is arranged on the spacer plate, a plurality of first sleeves is mounted on the spacer plate, and two plug inserts are mounted on the first base in such a way that they are separated by the spacer plate;
   that the second terminal has a second base, a signal socket outlet and two plug insert sockets are arranged inside the second base of the second terminal in such a way that they are connected with each other, each of the plug insert sockets is provided with a second sleeve, a guide groove which the spacer plate is able to be mounted in is arranged between the two plug insert sockets, a plurality of guide concave edges which are to be matched with the guide flanges is arranged in the guide groove, and the guide groove is provided with a plurality of insertion pins;
   that by assembling, the first base of the first terminal is to be inserted into the second base of the second terminal in such a way that the plug inserts are inserted into the first sleeves and the spacer plate is received by the guide groove fittingly, and the guide flanges and the guide concave edges act together and thereby conduct the insertion of the spacer plate into the guide groove, facilitating the insertion of the insertion pins into the first sleeves.

2. The connector as claimed in claim 1, wherein the signal mount is provided with a plurality of signal pins and the signal socket outlet is provided with a plurality of signal receptacles; By inserting the first base of the first terminal into the second base of the second terminal, the signal pins are inserted into the signal receptacles accordingly so that small currents or signals can be transmitted when the signal pins and the signal receptacles are connected to a current source.

3. The connector as claimed in claim 1 or 2, wherein a wave-shaped elastic band is further pulled around

the outside of the first base; When the first base of the first terminal is inserted in the second base of the second terminal, the elastic band abuts on the internal surface of the second base, achieving an anti-slip and waterproof effect.

4. The connector as claimed in claim 1 or 2, wherein the insertion pin and the first sleeve are formed as a terminal for small currents and a port for the terminal.

5. The connector as claimed in claim 1 or 2, wherein the insertion pin and the first sleeve are formed as a slim axis and a sleeve element which fit into each other.

6. The connector as claimed in claim 1 or 2, wherein the plug insert and the second sleeve are formed as a terminal for large currents and a port for the terminal.

7. The connector as claimed in claim 1 or 2, wherein the plug insert and the second sleeve are formed as a thick axis and a sleeve element which fit into each other.

8. The connector as claimed in claim 7, wherein a nonskid rim is arranged on the plug insert, wherein by inserting the plug insert into the second sleeve, the nonskid rim abuts on the internal surface, achieving an anti-slip effect and preventing the first terminal from loosening from the second terminal.

9. The sprinkler base as claimed in claim 1 or 2, wherein the inner diameter of the first sleeve is smaller than 3 mm.

10. The sprinkler base as claimed in claim 1 or 2, wherein the spacer plate and the guide groove have a draft angle of 1° to 5°.

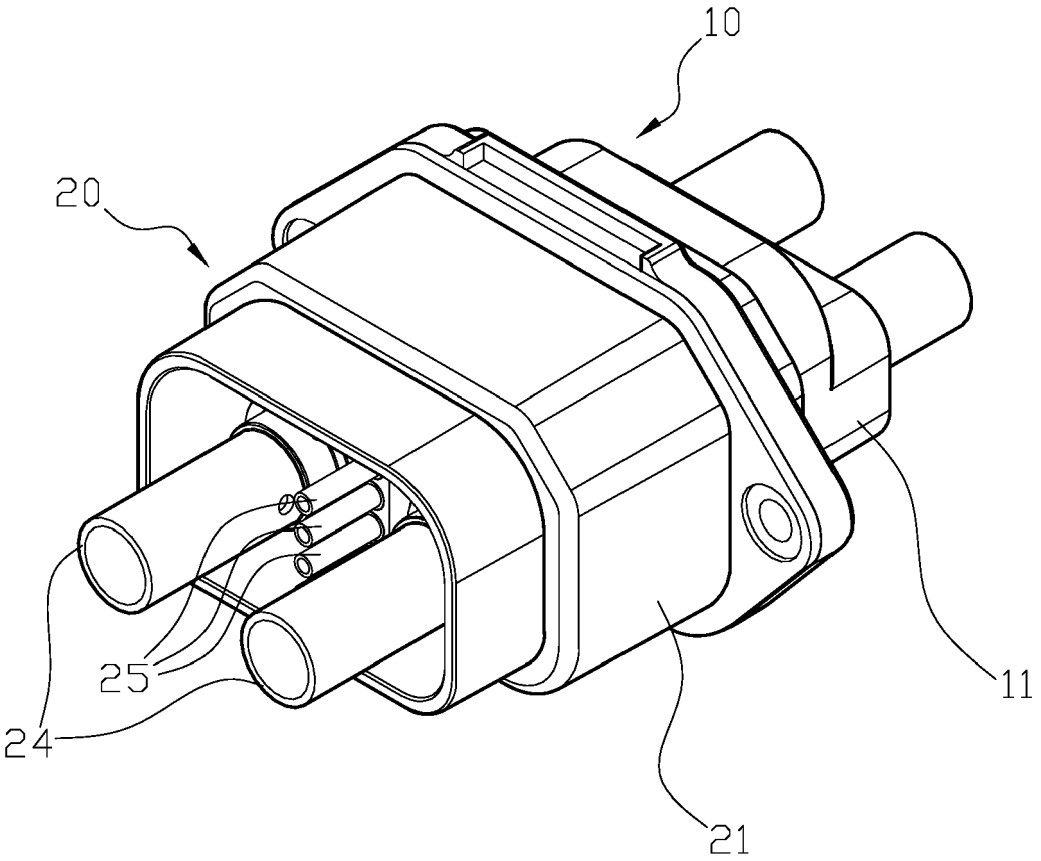


FIG. 1

FIG. 2

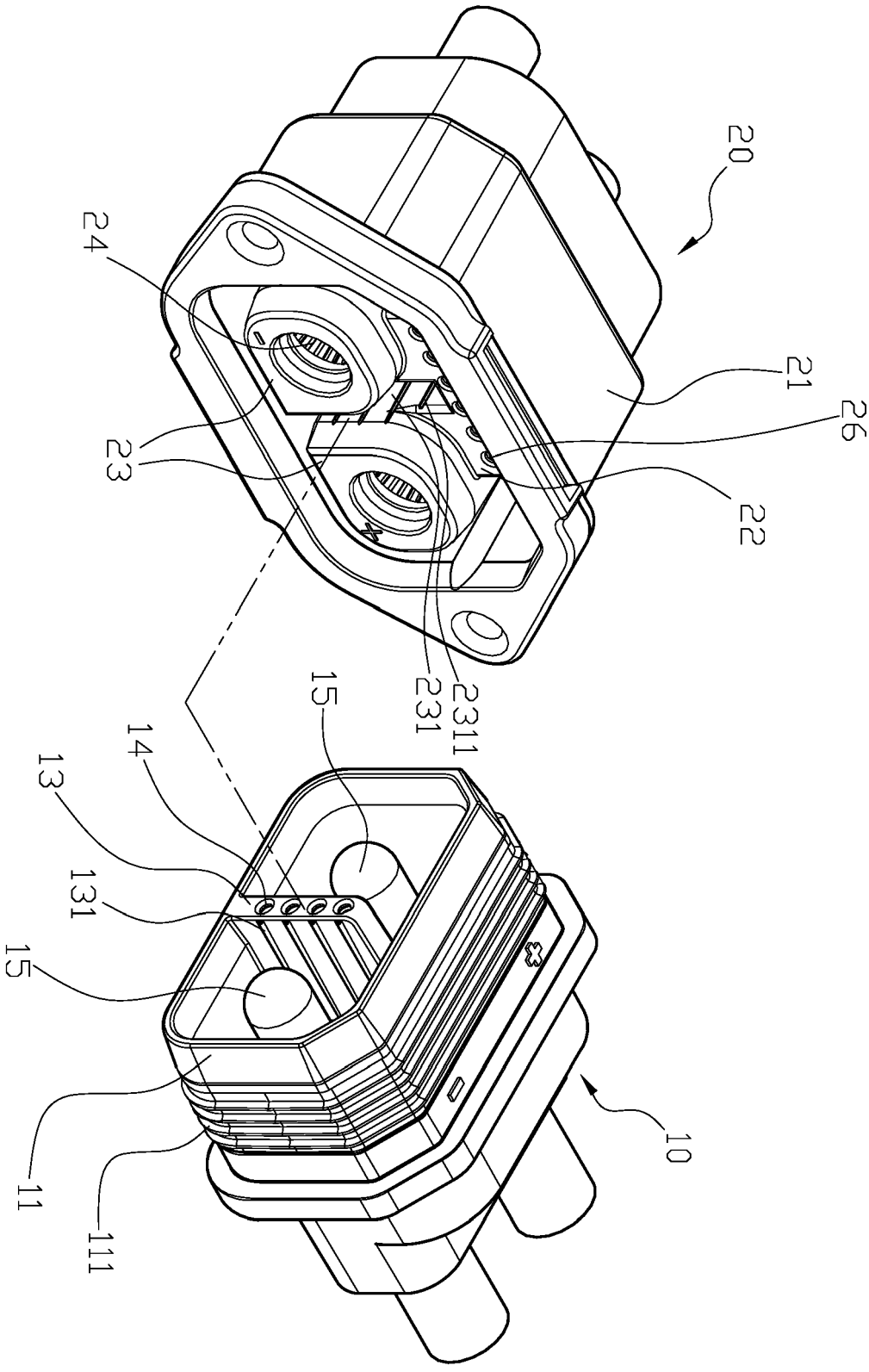
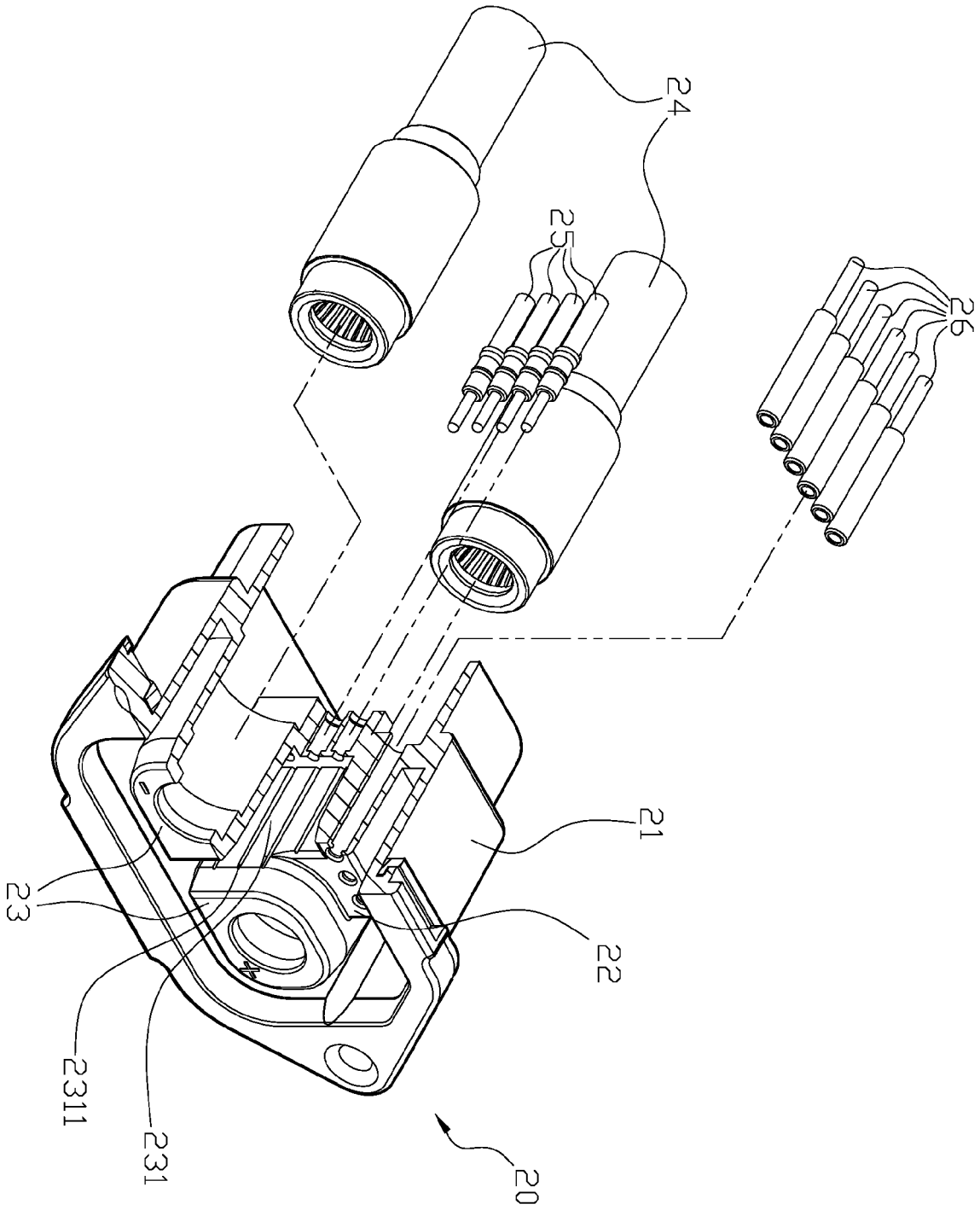


FIG. 3



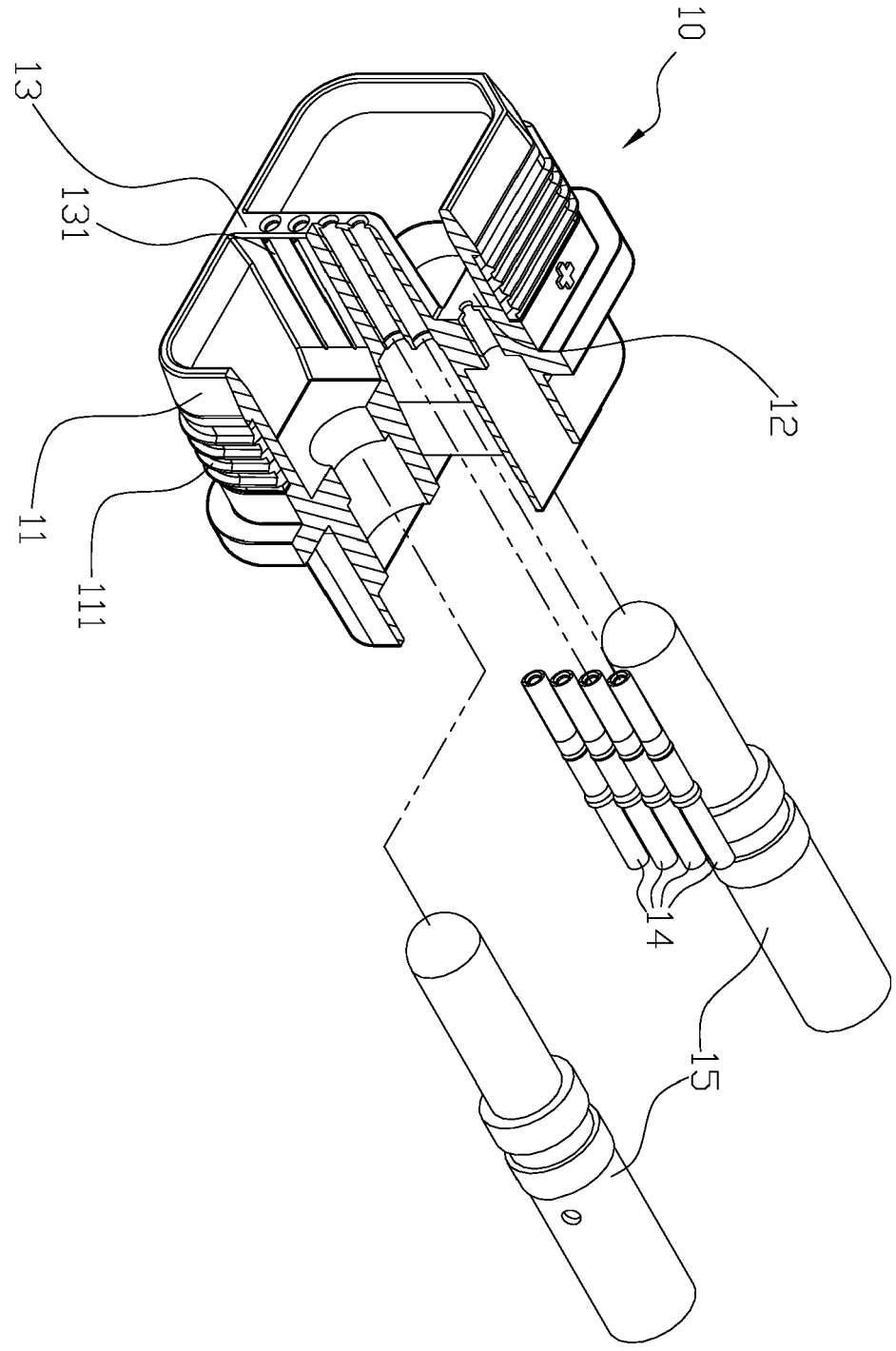


FIG. 4

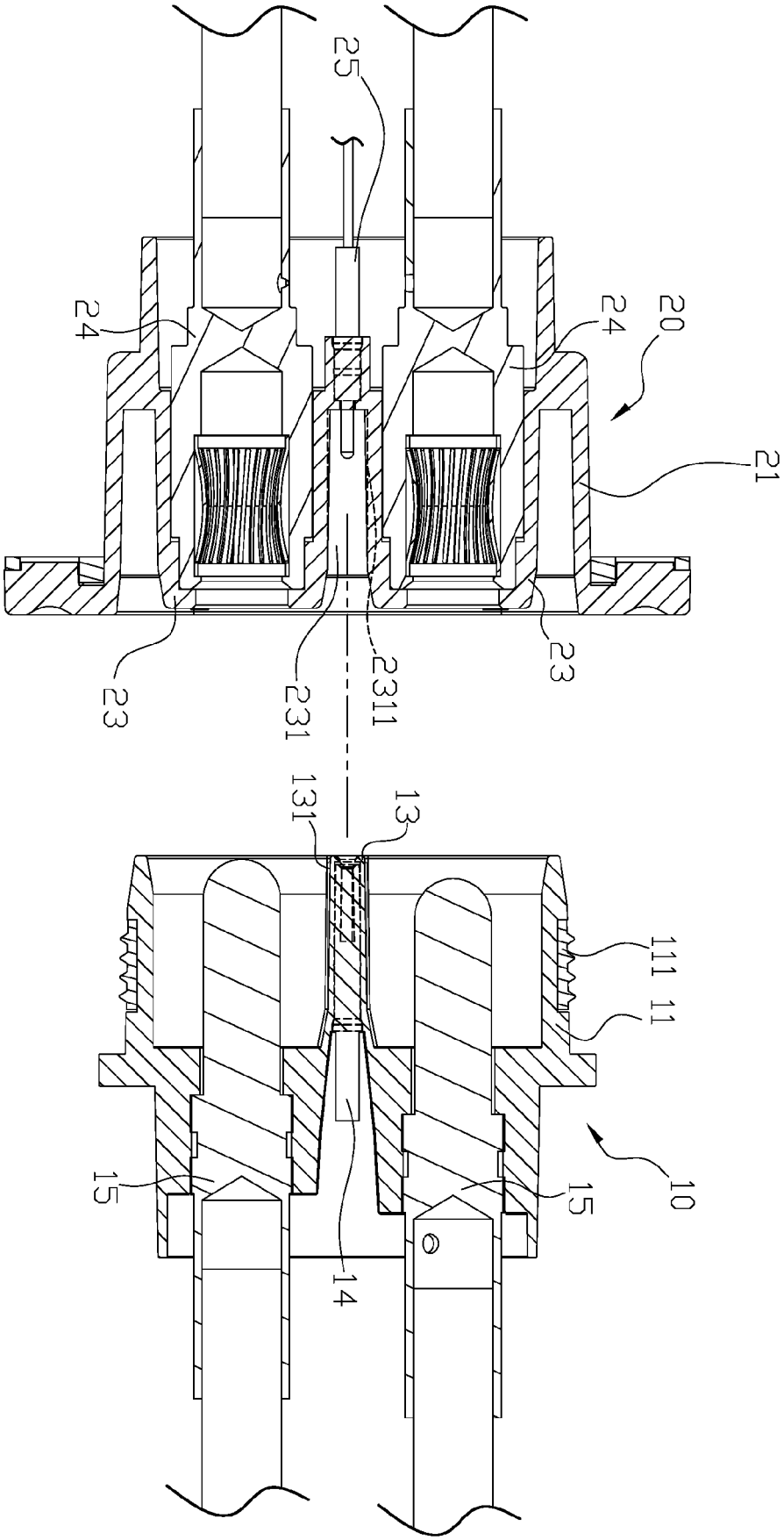


FIG. 5

FIG. 6

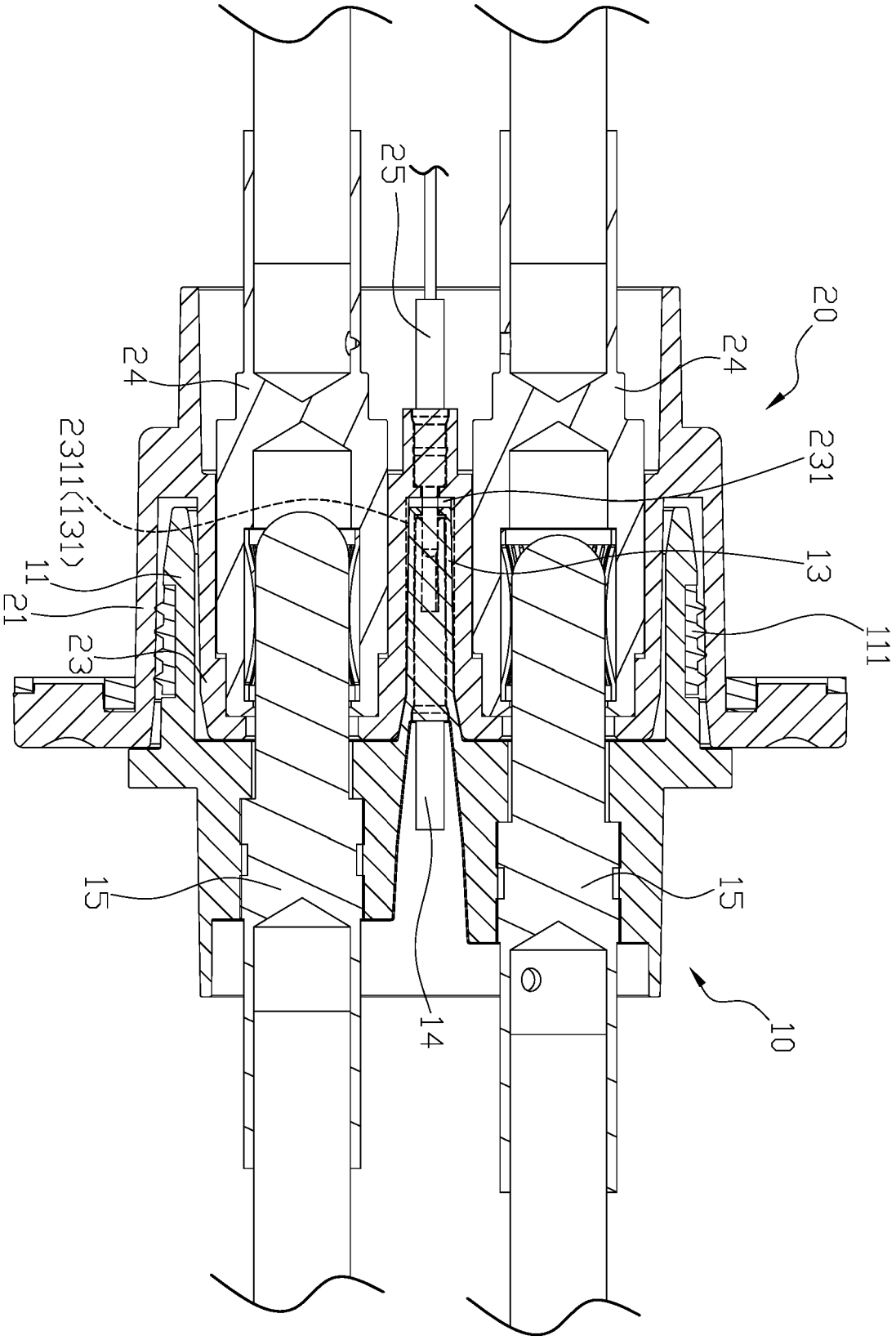
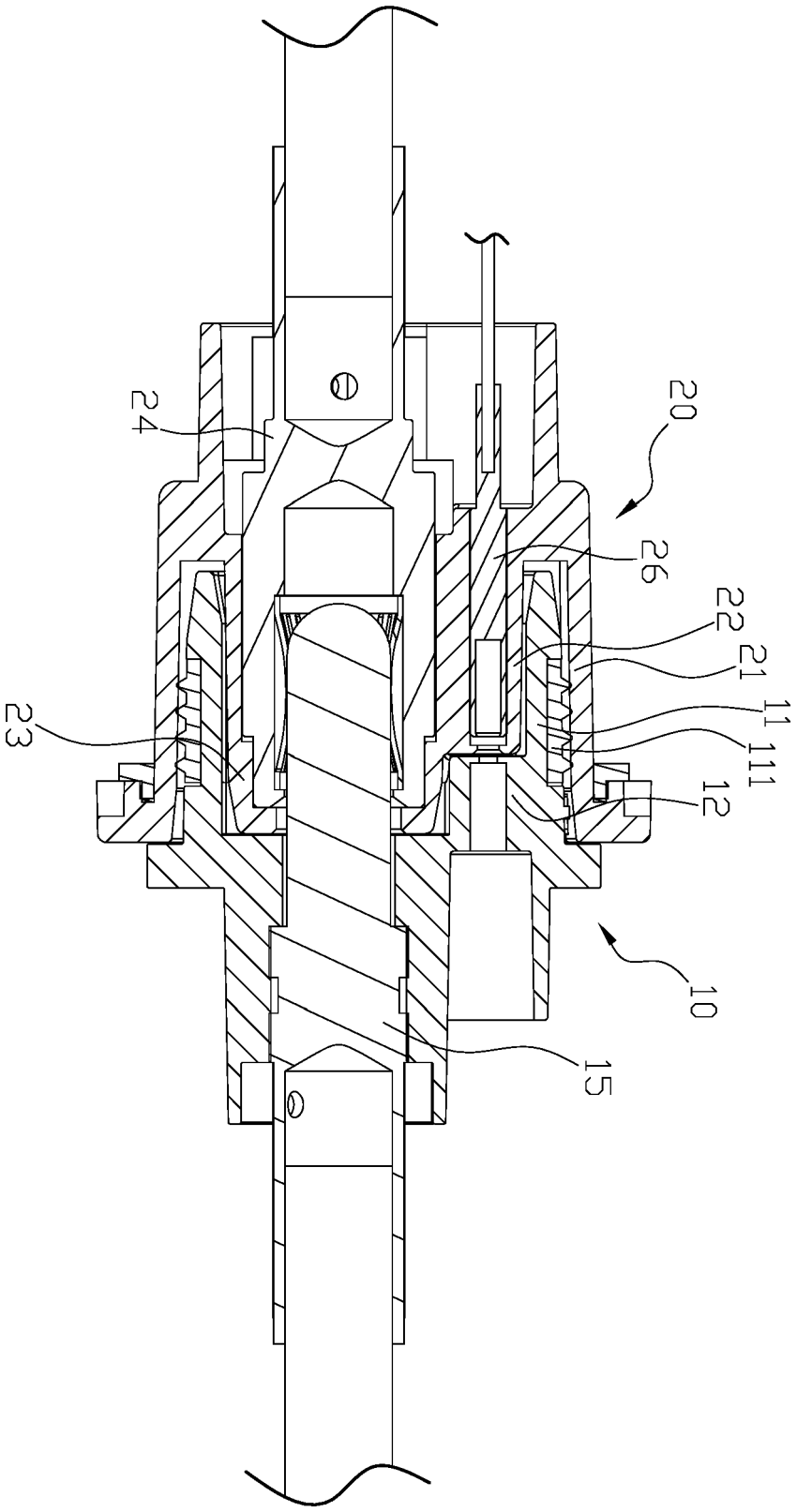


FIG. 7



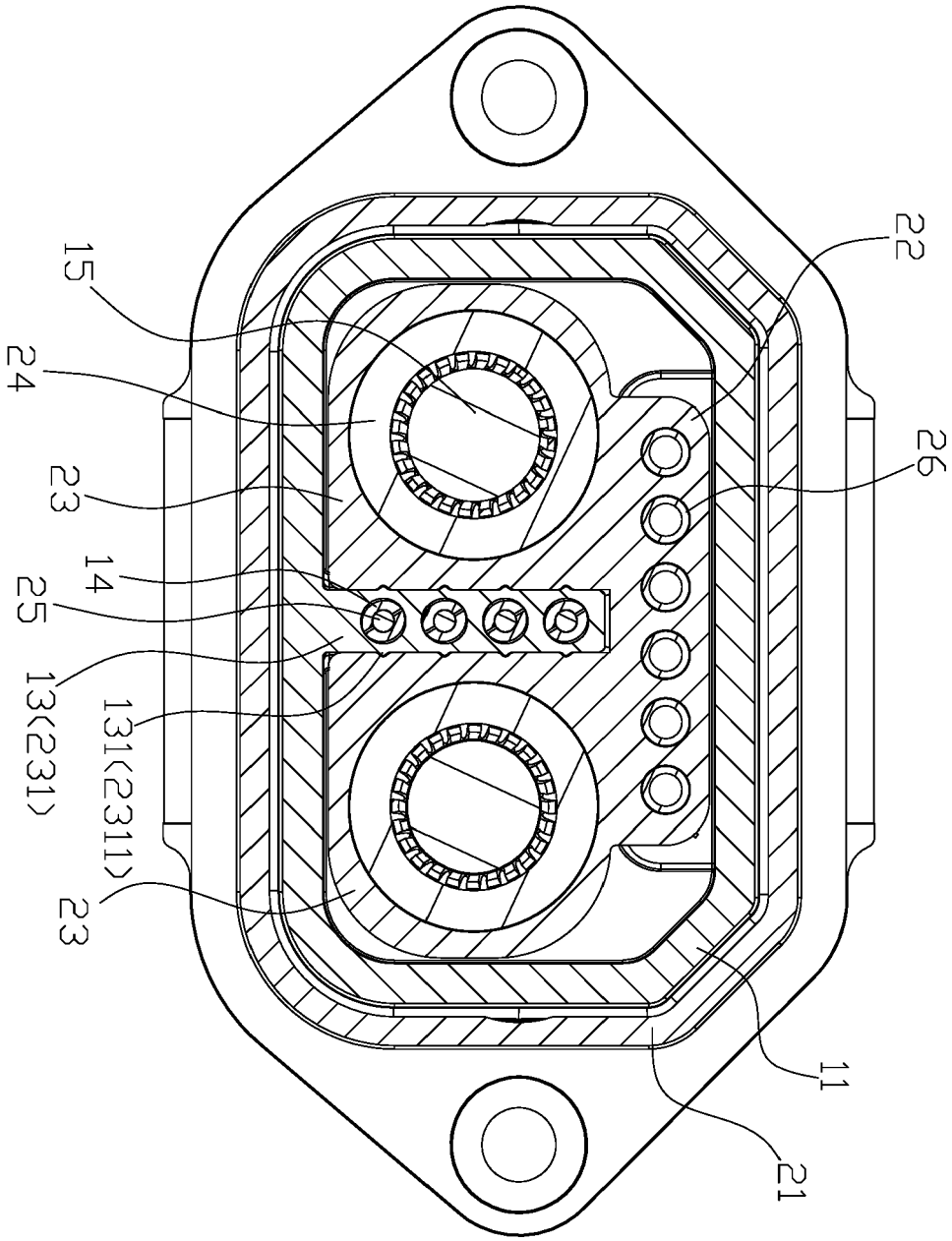


FIG. 8

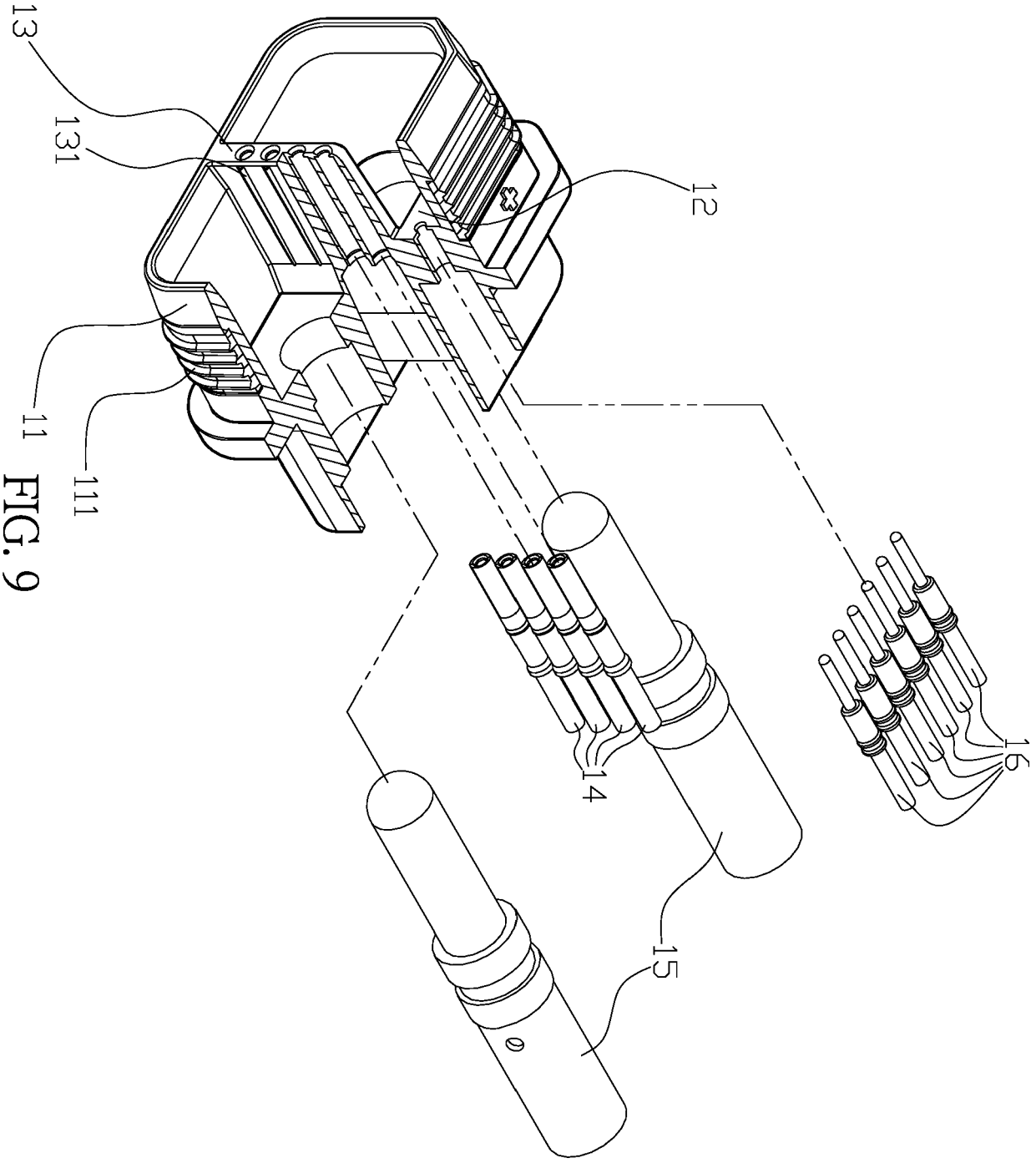
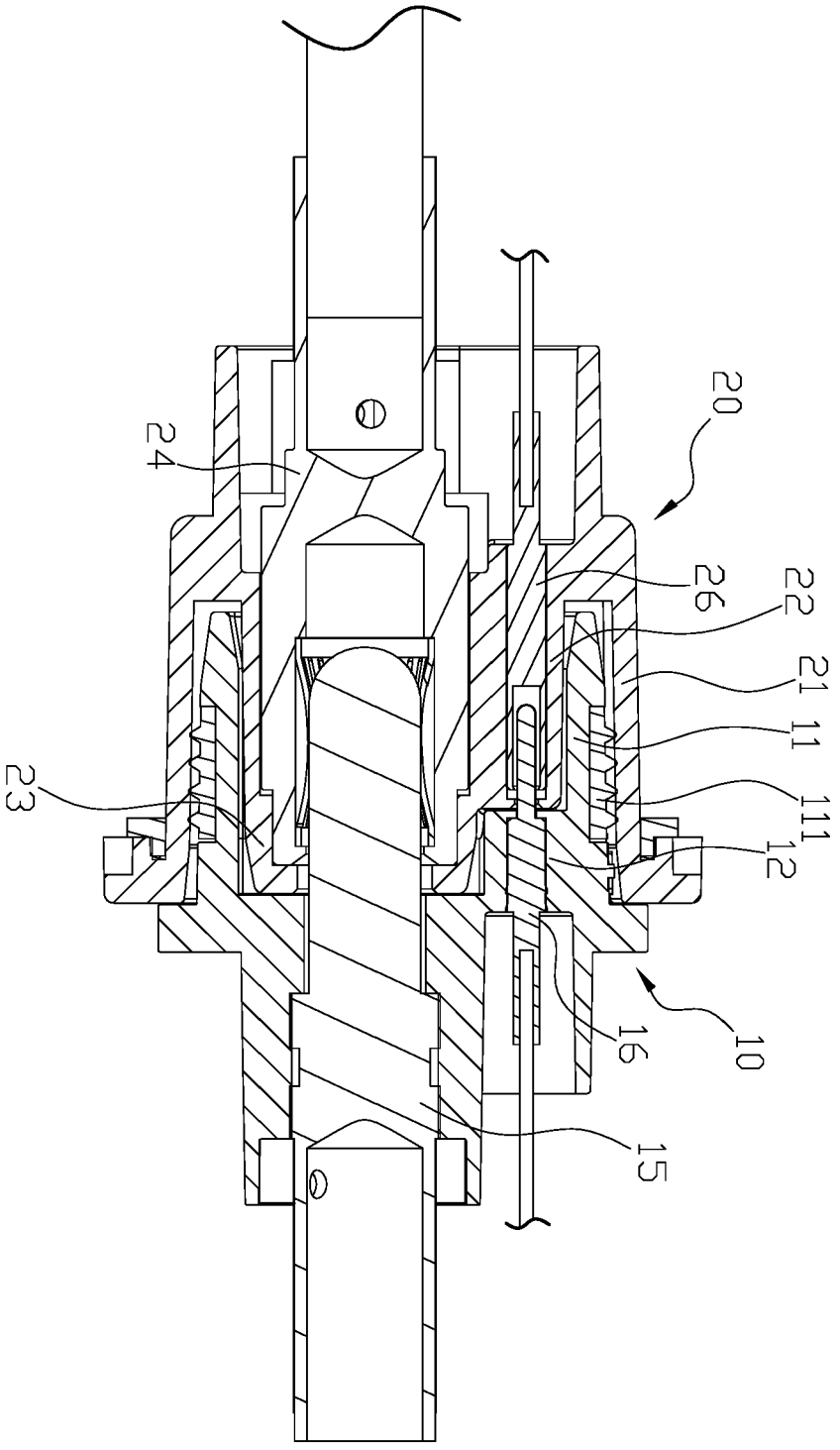


FIG. 9

FIG. 10



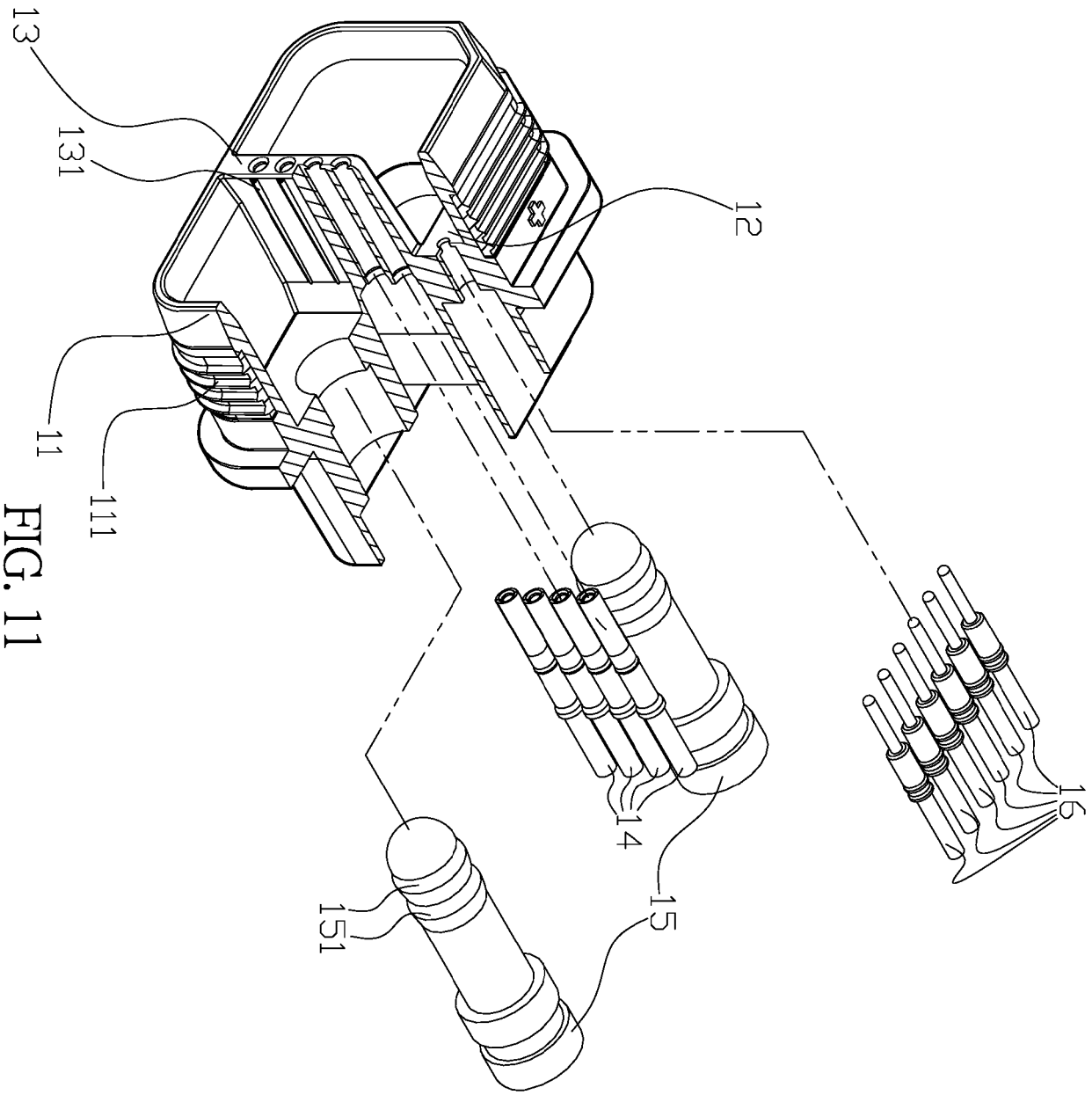
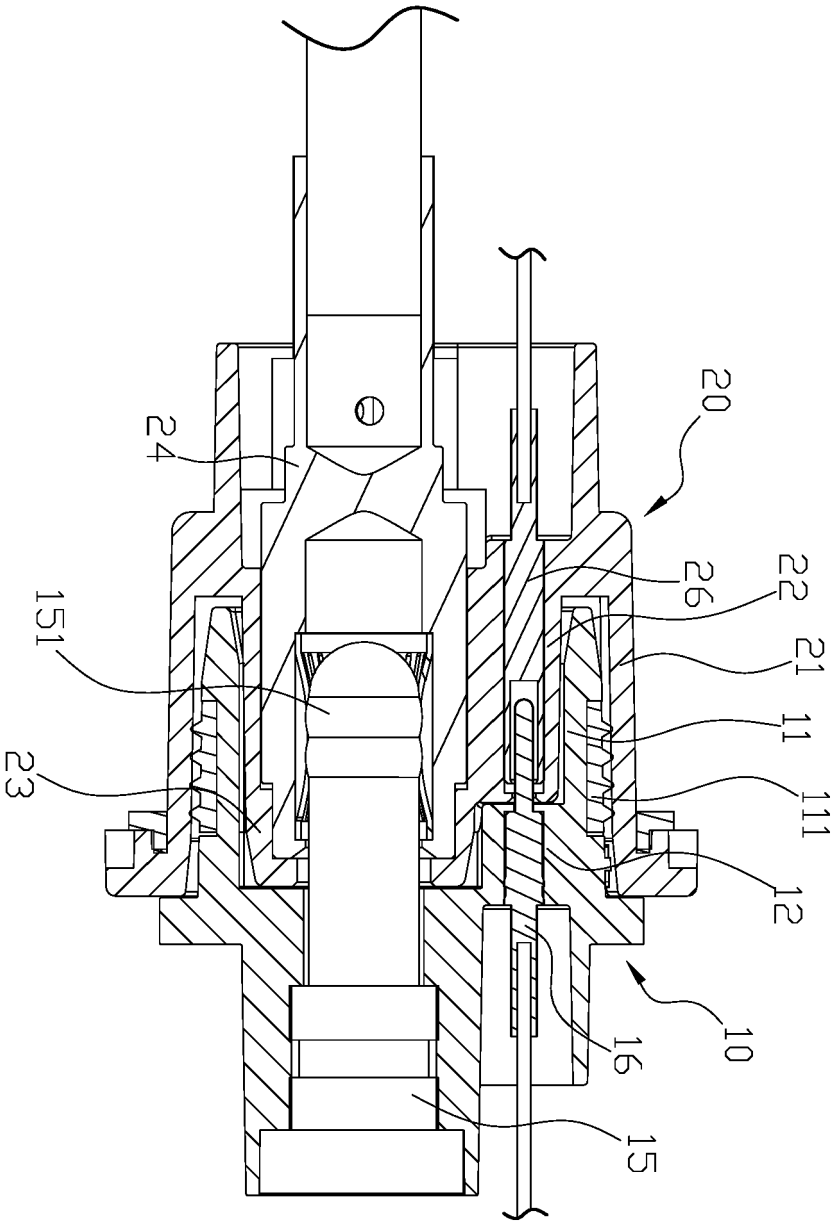


FIG. 11

FIG. 12



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EUROPEAN SEARCH REPORT

Application Number
EP 22 17 3666

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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Y	* abstract; figures 1,2,3,4,5 * * paragraph [0034] - paragraph [0035] *	3	H01R13/631 ADD.
Y	US 2021/057846 A1 (LAI AUSTIN [TW] ET AL) 25 February 2021 (2021-02-25)	3	H01R13/52
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TECHNICAL FIELDS SEARCHED (IPC)
H01R

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	25 October 2022	Skaloumpakas, K

CATEGORY OF CITED DOCUMENTS

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