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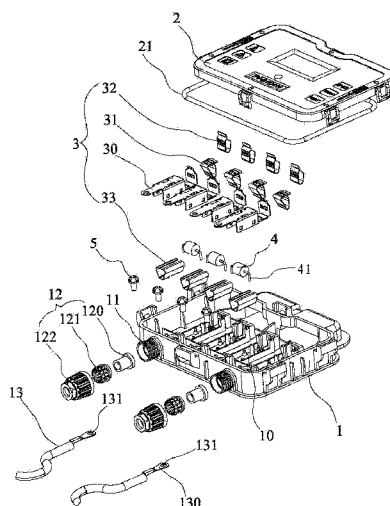


Fig. 1

(57) Abstract: A junction box for a solar battery comprises a box body (1) in which a plurality of connector bases (10) are fixed, and a plurality of connection assemblies (3) detachably connected with respective ones of the plurality of connector bases (10). Each connection assembly (3) comprises a bracket (30) and an elastic member (33). The bracket (30) is detachably connected with the respective connector base (10) and configured to form an accommodating space with the respective connector base (10), and the elastic member (33) is received within the accommodating space. The brackets (30) of immediately adjacent connection assemblies (3) are formed with respective via-holes (3023) for insertion of pins (41) of a diode (4) to couple the diode (4) between the respective immediately adjacent connection assemblies (3). The junction box can be easy for maintenance with low cost.



JUNCTION BOX FOR SOLAR BATTERY

CROSS-REFERENCE TO RELATED APPLICATIONS

The present disclosure claims the priority to, and the benefits of Chinese Patent
5 Application No. 201020249667.2 filed on June 30, 2010, which is incorporated by
reference herein in its entirety.

FIELD

The present disclosure relates to solar battery, more particularly to a junction box for a
10 solar battery.

BACKGROUND

With the development of solar industry, requirements of solar battery subassemblies
appear to increase. As a kind of solar battery subassembly, a junction box for a solar
15 battery can export electric energy generated by the solar battery. Thus, the design and
application of the junction box for a solar battery are rapidly and continuously changing.
Generally, a solar battery assembly may comprise a backplate, a binder, some solar-cell
arrays and a glass plate. The junction box is fixed to the backplate and connected to the
solar-cell arrays via a connection cable. The junction box can provide power to outside
20 as an output terminal.

Generally, a junction box may comprise a box body and a cover coupled with the box
body. A plurality of connector bases may be formed or disposed in the box body, and
corresponding connection assemblies may be fixed on the connector bases. Connection
cables of solar battery cells and external cables may be connected with respective ends
25 of the connection assemblies, and the connection assemblies may function for current
conduction between the connection cables and the external cables. The junction box
may further comprise diodes connected between every two neighboring connection
assemblies. Currently, the diodes may be welded to the connection assemblies. Thus,
a long time may be required to assemble the diodes, and insufficient soldering may
30 accidentally occur, which may create an issue with replacement of the damaged diode(s).

Further, disassembly may not be convenient for the conventional junction box currently in use.

SUMMARY

5 In view thereof, the present disclosure may provide a junction box for a solar battery which may be easy for replacement and/or maintenance with low cost, and which may thereby solve one or more of the above-mentioned problems.

According to an embodiment of the present disclosure, a junction box for a solar battery may be provided. The junction box may comprise a box body in which a plurality of
10 connector bases are fixed, and a plurality of connection assemblies detachably connected with respective ones of the plurality of connector bases. Each connection assembly may comprise a bracket and elastic member. The bracket is detachably connected with a respective connector base and configured to form an accommodating space with the
15 space. The bracket may comprise a first end connectable with an external cable, and a second end connectable with a connection cable of the solar battery. The brackets of immediately adjacent connection assemblies are formed with respective via-holes for insertion of pins of a diode to couple the diode between the respective immediately adjacent connection assemblies, with the pins being capable of being clamped between
20 the respective immediately adjacent connection assemblies.

According to the junction box for a solar battery of the present disclosure, the diode may be easily inserted into the corresponding via-holes of the bracket, with the pins being tightly clamped between the elastic member and the bracket. When the diode may need to be replaced or checked, the diode may be plugged out and a new diode may be
25 replaced instead, which is convenient for maintenance with low cost.

BRIEF DESCRIPTION OF THE DRAWINGS

Having thus described embodiments of the present disclosure in general terms, reference will now be made to the accompanying drawings, which are not necessarily
30 drawn to scale, and wherein:

Fig. 1 is an exploded perspective view of a junction box for a solar battery accordina

to an embodiment of the present disclosure;

Fig. 2 is a perspective view showing an inside portion of a body of the junction box according to an embodiment of the present disclosure;

Fig. 3 is a bottom perspective view of a body of the junction box according to an
5 embodiment of the present disclosure;

Fig. 4 is a perspective view of a cover according to an embodiment of the present disclosure;

Fig. 5 is a cross sectional view of a junction box for a solar battery according to an embodiment of the present disclosure;

10 Fig. 6 is a plan view of a junction box for a solar battery with a cover thereof being removed according to an embodiment of the present disclosure;

Fig. 7 is a top perspective view of a metallic bracket according to an embodiment of the present disclosure;

15 Fig. 8 is a bottom perspective view of a metallic bracket according to an embodiment of the present disclosure;

Fig. 9 is a perspective view of a U-shaped elastic member according to an embodiment of the present disclosure;

Fig. 10 is a perspective view of a o-shaped elastic member according to an embodiment of the present disclosure;

20 Fig. 11 is a perspective view of a U-shaped elastic member according to an embodiment of the present disclosure;

Fig. 12 is a perspective view of a claw-shaped cable gland according to an embodiment of the present disclosure;

25 Fig. 13 is a perspective view of a screwing nut according to an embodiment of the present disclosure; and

Fig. 14 is a perspective view of an enlarged part I shown in Fig. 2.

DETAILED DESCRIPTION

30 The present disclosure now will be described more fully with reference to the accompanying drawings, in which some, but not all embodiments of the disclosure are

shown. This disclosure may be embodied in many different forms and should not be construed as limited to the embodiments set forth; rather, these embodiments are provided so that the present disclosure will be thorough and complete, and will fully convey the scope of the disclosure to those skilled in the art. Like numbers refer to like elements throughout.

As shown in Figs. 1, 2, 5 and 6, according to an embodiment of the present disclosure, a junction box for a solar battery may comprise: a box body 1 in which a plurality of connector bases 10 are fixed; a cover 2 coupled with the box body 1; and a plurality of connection assemblies 3 connected with respective ones of the connector bases 10. The junction box may further comprise one or more diodes 4 each of which is coupled between immediately adjacent connection assemblies 3.

As shown in Fig. 1, in some embodiments, the connection assembly 3 may comprise a bracket 30 such as a metal bracket, and an elastic member 33. As shown in Fig. 5, the bracket 30 is detachably connected with the connector base 10. The bracket 30 is configured to form an accommodating space 100 with the connector base 10, with a first end thereof being connectable with an external cable 13 and a second end thereof being connectable with a connection cable (not shown) of a solar battery. The elastic member 33 may be received within the accommodating space 100. In some embodiments, the brackets 30 of immediately adjacent connection assemblies 3 are formed with respective via-holes 3023 for insertion of pins 41 of a diode 4 to couple the diode 4 between the respective immediately adjacent connection assemblies 3, with the pins 41 being capable of being clamped between the respective immediately adjacent connection assemblies 3 (including their respective brackets 30 and elastic members 33). In some embodiments, the brackets 30 of immediately adjacent connection assemblies 3 may be formed with respective pluralities of via-holes 3023 for insertion of pins 41 of a plurality of diodes 4 to couple the diodes 4 in parallel between the respective immediately adjacent connection assemblies 3.

As shown in Figs. 7 and 8, the metal bracket 30 may comprise a first end portion 301 connected to the external cable 13, a middle portion 302 and a second end portion 303 configured to detachably fix the connection cable of the solar battery. The middle portion

302 may comprise two sides 3021 and an upper portion 3020 formed with via-holes 3023 with the sides 3021 being extended from the middle portion 302 toward the connector base 10 to form the accommodating space 100, as shown in Fig. 5. The first end portion 301 and the second end portion 303 may extend from the upper portion 3020 of the middle portion 302 opposite one another, as shown in Figs. 7 and 8.

In some embodiments, the elastic member 33 may be configured to have a U-shaped body with two free ends curved toward each other. As shown in Fig. 9, the U-shaped elastic member 33 may comprise two elastic parts 331 interconnected with a connection part 332. The connection part 332 may be formed with a positioning hole 333. As shown in Fig. 14, the connector base 10 may be formed with a positioning projection 104 configured to engage the positioning hole 333.

Returning to Fig. 5, the U-shaped elastic member 33 may be covered by the bracket 30 under the middle portion 302 of the bracket 30, i.e., inside the accommodating space 100, with the positioning projection 104 being fitted into the positioning hole 333 so that the elastic member 33 is stably positioned under the middle portion 302.

As shown in Fig. 7 and Fig. 8, the second end portion 303 may comprise: a first vertical portion 3034 extending from the upper portion 3020 of the middle portion 302; a bottom portion 303a connected with the first vertical portion 3034 and to be contacted with the connector base 10 connected with the first vertical portion 3034; and a second vertical portion 303b extending upwardly from the bottom portion 303a opposite from the first vertical portion 3034. In some embodiments, the bottom portion 303b may be formed with a second positioning hole 3031, and the connector base 10 may be formed with a second positioning projection 105 (shown in Fig. 14) to be engaged with the second positioning hole 3031. And as further explained below, in some embodiments, the second vertical portion 303b may be formed with a third positioning hole 3033.

As shown in Fig. 6, the pins 41 of the diode 4 may be inserted in the via-holes 3023 and clamped between the U-shaped elastic member 33 and an inner wall of the side 3021 of the middle portion 302.

As shown in Figs. 7 and 8, the side 3021 of the middle portion 302 may be formed with a groove 3022. And as shown in Fig. 14, a clamping projection 103 may be formed

on the connector base 10 facing the middle portion to be engaged with the groove 3022 so that the bracket 30 may be securely fixed inside the connector base 10.

As shown in Fig. 1, according to an embodiment of the present disclosure, four connector bases 10 are disposed on the bottom of the box body 1 for fixing respective connection assemblies 3. Each connector base 10 may be adapted to the shape of the bracket 30. Generally, the connector base 10 may have a groove shape, and the bracket 30 may be fixed in the box body 1 by fastening, welding or the like.

As shown in Fig. 14, according to an embodiment of the present disclosure, the connector base 10 may be formed with a dividing projection 106 to divide the connector base 10 into two parts, a first fixed part 101 and a second fixed part 102. The first fixed part 101 may be used to position the second end portion 303 of the bracket 30, and the second fixed part 102 may be used to position the middle portion 302 of the bracket 30.

As shown in Figs. 7 and 8, the second end portion 303 comprises a bottom portion 303a, a first vertical portion 3034 and a second vertical portion 303b. The bottom portion 303a may be contacted with the connector base 10 which may be connected with the first vertical portion 3034. And the second positioning hole 3031 may be formed on the bottom portion 303a. As shown in Fig. 7, the second vertical portion 303b may be configured to be closely contacted with a U-shaped elastic member 32 (described below). The second vertical portion 303b extends upwardly from the bottom portion 303a which may be formed with two guiding portions 3032 at both lateral edges, as shown in Fig. 8. As shown in Fig. 14, the connector base 10 may be formed with guide grooves 107 so that the guiding portions 3032 may be guided along the guide grooves 107 as the bracket 30 is fitted to the connector base 10.

As shown in Figs. 5, 6, 10 and 11, the connection assembly 3 may further comprise a o-shaped elastic member 31 and a U-shaped elastic member 32. As shown in Fig. 10, the σ -shaped elastic member 31 generally has a σ shape and may comprise a flat portion 313 formed with a square hole 313a, a first curved portion 312, a second curved portion 311 and an extended portion 314 passing through the square hole 313a. As shown in Fig. 11, the U-shaped elastic member 32 may comprise a first arm portion 321 and a second arm portion 322 longer than the first arm portion 321 which form a U-shape.

The σ -shaped elastic member 31 may be positioned inside the second end portion 303, and the U-shaped elastic member 32 may be positioned between the second end portion 303 and the connector base 10. A portion of the σ -shaped elastic member 31 may penetrate through the third positioning hole 3033 to push against the second arm portion 322 of the U-shaped elastic member 32 (to be described hereinafter). When in use, the connection cable of the solar battery may be clamped between the second vertical portion 302b of the bracket 30 and the second arm portion 322 of the U-shaped elastic member 32.

In some embodiments, the second positioning projection 105 may have a height adapted to elastically push against the curved portion 312 of the σ -shaped elastic member 31.

When assembling, as shown in Fig. 5, the σ -shaped elastic member 31 and the U-shaped elastic member 32 may be positioned in the second end portion 303 of the bracket 30. As shown in Figs. 1, 5 and 14, the U-shaped elastic member 33 may be positioned in the second fixed part 102 of the connector base 10, and the positioning projection 104 of the connector base 10 may be positioned in the location hole 333 of the U-shaped elastic member 33. Secondly, the second end portion 303 of the bracket 30 may be fastened to the first fixed part 101 of the connector base 10, and the middle portion 302 of the bracket 30 may be fastened in the second fixed part 102 of the connector base 10.

As shown in Fig. 1, a side of the box body 1 may be formed with a plurality of screwing portions 11 (two being shown); and an end 131 of the external cable 13 may pass through the screwing portion 11 and connect with the first end portion 301 of the bracket 30. In some embodiments, the junction box may further comprise a T-shaped plug 120 placed inside the screwing portion 11; a claw-shaped cable gland 121 fitted over a stem portion of the T-shaped plug 120; and a screwing nut 122 threadedly coupled to the screwing portion 11. With these components, the end 131 of the external cable 13 may be fixed on a boss 151 via the coupled screwing nut 122, the claw-shaped cable gland 121, the T-shaped plug 120 and the screwing portion 11 respectively, as shown in Fig. 6.

As shown in Fig. 12, an end of the claw-shaped cable gland 121 may be configured

with some peripherally distributed claw-shaped parts 1210 which may be tightened inwardly as the screwing nut 122 is fitted over the cable gland 121 and screwed onto the screwing portion 11.

As shown in Fig. 13, the screwing nut 122 may comprise a multi-grooved cylindrical part 1221 and a hexagon-shaped part 1222 integrally formed with the multi-grooved cylindrical part 1221. The multi-grooved cylindrical part 1221 may be easily, manually manipulated. And the hexagon-shaped part 1222 may be easily screwed by tools such as a wrench.

The steps for installing the external cable 13 may as follows. The screwing nut 122, the claw-shaped cable gland 121 and the T-shaped stopper 120 may be fitted over the external cable 13. The T-shaped stopper 120 may then be placed in the screwing portion 11, the claw-shaped cable gland 121 may be inserted in the screwing portion 11 with the claw-shaped parts 1210 of the claw-shaped cable gland 121 facing outwardly. Lastly, the screwing nut 122 may be screwed onto the screwing portion 11. The claw-shaped parts 1210 may be tightened inwardly for sealing due to the forces applied to the claw-shaped cable gland 121 by the plastic nut 122.

As shown in Figs. 7 and 8, the first end portion 301 of the bracket 30 may be formed with at least a threaded hole 3010. A cable terminal 130 formed at an end of the connection cable 13 may be formed with a threaded hole 131 accordingly. And when assembling, a screw 5 may be used to connect the first end 301 with the cable terminal 130, such as by engaging the screw 5 through the first end 301 and threaded hole 131, and into a hole 15 formed by the boss 151. As shown in Figs. 1, 5, 7, 8 and 14, the box body 1 may be formed therein with bosses 151 for respective ones of the connector bases 10.

As shown in Figs. 1 and 4, the edge of the cover 2 may be formed with a peripheral sealing groove 20 into which a seal ring 21 may be disposed. And in some embodiments, the seal ring 21 may be an O-shaped seal ring.

As shown in Figs. 1-4, in some embodiments, the box body 1 may be formed with at least one clipping portion 14; and the cover 2 may be formed with at least a retaining portion 24 to be engaged with the clipping portion 14. It should be understood, however,

that the cover 2 may be engaged or coupled with the box body 1 via any other known means, such as screwing, clipping or the like.

The bottom of the box body 1 may be formed with via-holes 16 for heat dissipation, as shown in Fig. 3. As shown in Fig. 3, the back side of the box body 1 may be formed with an open part 17 through which the connection cable of the solar battery may pass to be connected with the second end portion 303 of the bracket 30. More specifically, as shown in Fig. 5, in an instance in which the connection cable (not shown) of the solar battery is inserted through the open part 17, a tool, such as a screw driver, may be inserted between the second positioning projection 105 and the first curved portion 312 of the o-shaped elastic member 31. In turn, the first curved portion 312 may be pressed by the tool so that the flat portion 313 of the σ -shaped elastic member 31 may be moved to further press the second arm portion 322 of the U-shaped elastic member 32, resulting a clearance being formed between the second arm portion 322 and the second vertical portion 303b of the bracket 30. At this time, the connection cable may be placed in the clearance, and the tool may be released so that the connection cable of the solar battery may be tightly interposed therebetween. To release the connection cable, the tool may be used to further press the second arm portion 322, so that the connection cable may be easily released.

According to an embodiment of the present disclosure, two diodes 4 may be coupled between two neighboring brackets 30 in parallel to ensure that the diodes are not damaged by the rated current, and the heat may not be locally generated, which may be optimal for heat dissipation inside the junction box. In such an instance, if one of the diodes connected in parallel is damaged, the current conduction may be maintained by the remaining diodes which are not damaged.

As shown in Figs. 7 and 8, auxiliary openings 3024 may be formed on the top surface of the middle portion 302 of the bracket 30 neighboring the space between the U-shaped elastic member 32 and the bracket 30. These auxiliary openings 3024 may permit use of an auxiliary tool, such as a screw driver, to help inserting pins 41 of the diodes 4 to be clamped between the U-shaped elastic member 32 and the bracket 30, or to help the plug-off of the pins 41 to avoid damage to the diodes.

According to the present disclosure, the junction box has a desirable appearance which may be convenient for assembly and/or disassembly. In addition, the junction box of the present disclosure may exhibit increased heat dissipating performance. And when the diodes are damaged, the junction box has a design that facilitates their easily
5 replacement.

Although explanatory embodiments have been shown and described, it would be appreciated by those skilled in the art that changes, alternatives, and modifications can be made in the embodiments without departing from spirit and principles of the present disclosure. Such changes, alternatives, and modifications all fall into the scope of the
10 claims and their equivalents.

THAT WHICH IS CLAIMED:

1. A junction box for a solar battery comprising:

a box body in which a plurality of connector bases are fixed; and

a plurality of connection assemblies detachably connected with respective ones of the
5 plurality of connector bases, each connection assembly comprising:

a bracket detachably connected with a respective connector base and configured
to form an accommodating space with the respective connector base, with a first end
thereof being connectable with an external cable and a second end thereof being
connectable with a connection cable of the solar battery; and

10 an elastic member received within the accommodating space, wherein

the brackets of immediately adjacent connection assemblies are formed with
respective via-holes for insertion of pins of a diode to couple the diode between the
respective immediately adjacent connection assemblies, the pins being capable of
being clamped between the respective immediately adjacent connection assemblies.

15

2. The junction box of claim 1, wherein the brackets of immediately adjacent
connection assemblies are formed with respective pluralities of via-holes for insertion of
pins of a plurality of diodes to couple the diodes in parallel between the respective
immediately adjacent connection assemblies.

20

3. The junction box of claim 1, wherein the bracket comprises:

a middle portion including an upper portion and two sides extending from the upper
portion toward a respective connector base to form the accommodating space;

a first end portion extending from the upper portion of the middle portion and
25 configured to be connected with the external cable; and

a second end portion extending from the upper portion of the middle portion oppose
the first end portion, and configured to detachably fix the connection cable of the solar
battery.

30 4. The junction box of claim 3, wherein the elastic member is configured to have a
U-shaped body with two free ends curved toward each other.

5. The junction box of claim 3, wherein each connector base is formed with a first positioning projection that faces the middle portion of the bracket of a respective connection assembly, and

5 wherein the elastic member of each connection assembly is formed with a first positioning hole configured to engage the first positioning projection of a respective connector base.

6. The junction box of claim 3, wherein the box body is formed therein with a plurality
10 of bosses for respective ones of the plurality of connector bases,

wherein the bracket is detachably connected with the respective connector base such that the first end portion of the bracket is adjacent a respective boss, and such that the first end portion is fixable to the respective boss by a screw.

15 7. The junction box of claim 6, wherein the second end portion comprises:
a first vertical portion extending from the upper portion of the middle portion;
a bottom portion connected with the first vertical portion and which is to be contacted
with the respective connector base; and

a second vertical portion extending upwardly from the bottom portion.

20

8. The junction box of claim 7, wherein each connector base is formed with a second positioning projection, and

wherein the bottom portion is formed with a second positioning hole to be engaged
with the second positioning projection of a respective connector base.

25

9. The junction box of claim 8, wherein the second vertical portion is formed with a third positioning hole, and wherein each connection assembly further comprises:

a o-shaped elastic member positioned inside the second end portion; and

a U-shaped elastic member positioned between the second end portion and the
30 respective connector base, wherein a portion of the σ -shaped elastic member penetrates

through the third positioning hole to push against an arm portion of the U-shaped elastic member.

10. The junction box of claim 9, wherein the second positioning projection has a height adapted to elastically push against a curved portion of the o-shaped elastic member.

11. The junction box of claim 7, wherein each connector base is formed with guide grooves, and
wherein the second vertical portion is formed with guiding portions to be guided along the guide grooves as the bracket is fitted to the respective connector base.

12. The junction box of claim 6, wherein the box body comprises an external side wall on which a screwing portion is formed neighboring a boss of the plurality of bosses, and wherein an end of the external cable is penetrable through the screwing portion to be fixed on the respective boss.

13. The junction box of claim 12 further comprising:
a T-shaped stopper placed inside the screwing portion;
a claw-shaped cable gland fitted over a stem portion of the T-shaped plug; and
a screwing nut threadedly coupled to the screwing portion so that the end of the external cable is fixable on the boss via the screwing nut, the claw-shaped cable gland, the T-shaped plug and the screwing portion fitted together.

14. The junction box of claim 1 further comprising:
a cover to be coupled with the box body, wherein the cover is formed with a peripheral sealing groove into which a seal ring is coupled when the cover is coupled with the box body.

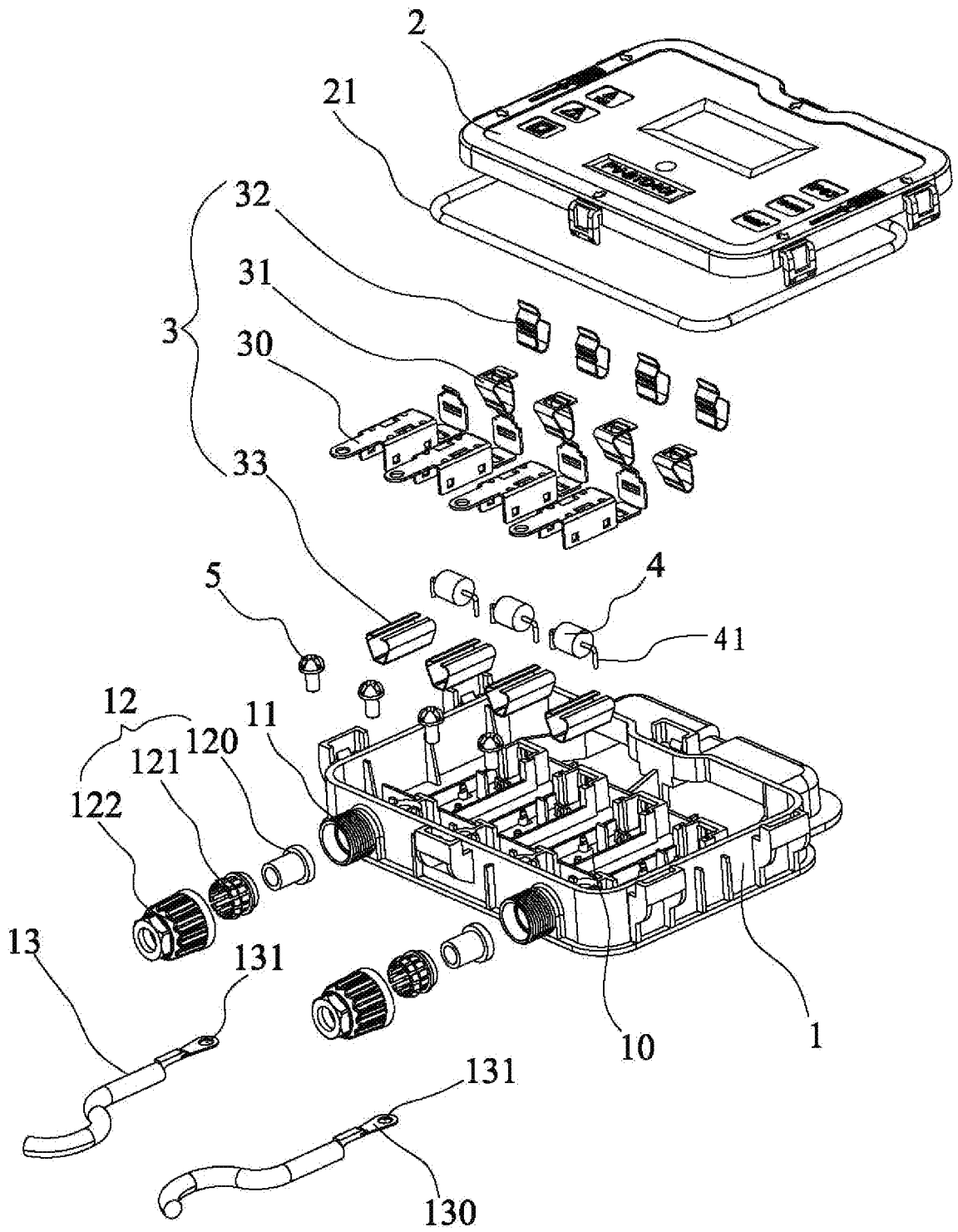


Fig. 1

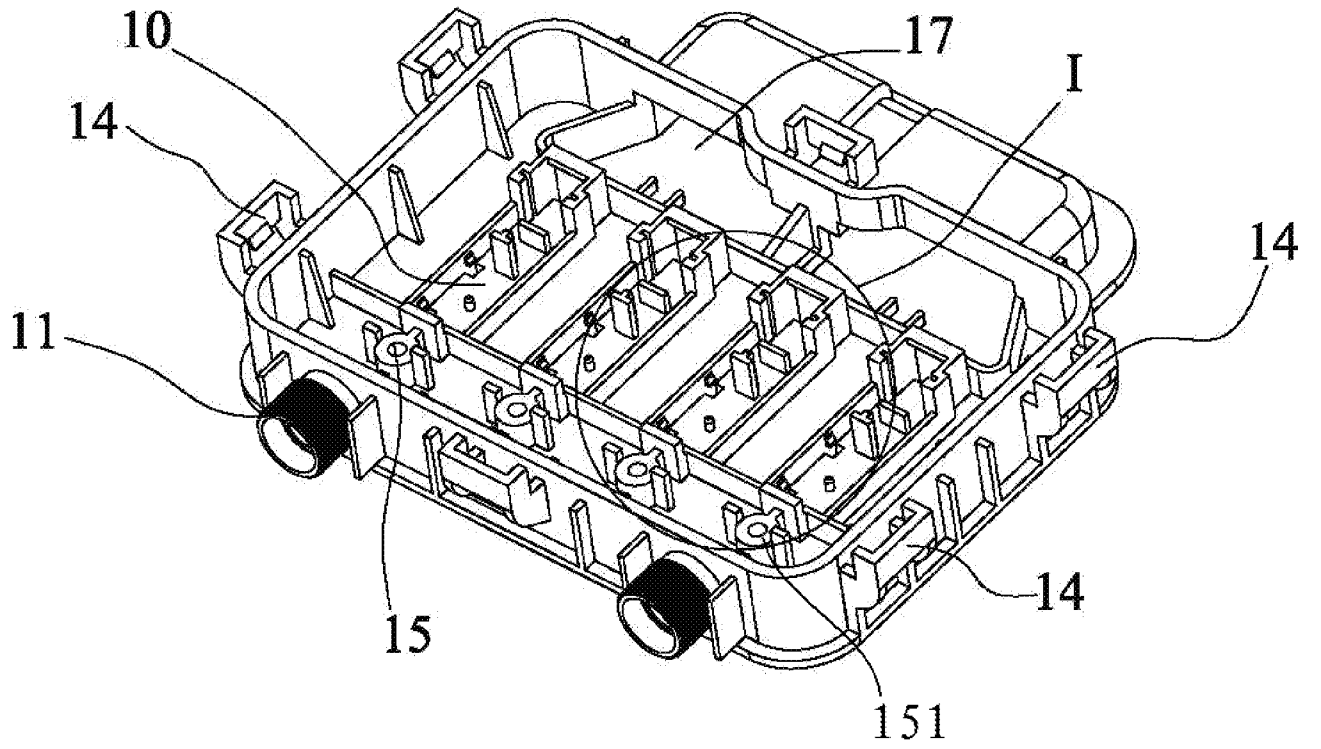


Fig. 2

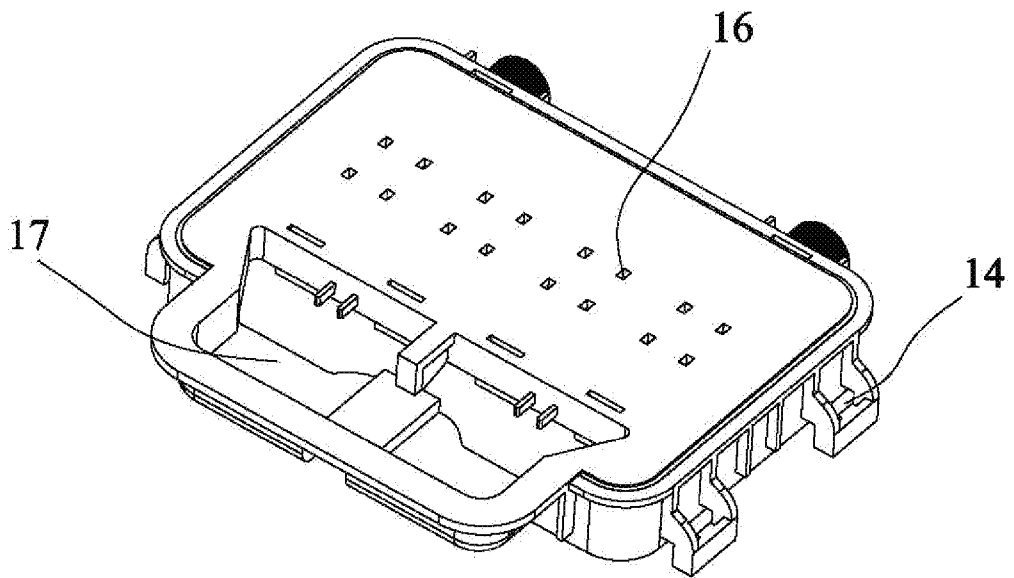


Fig. 3

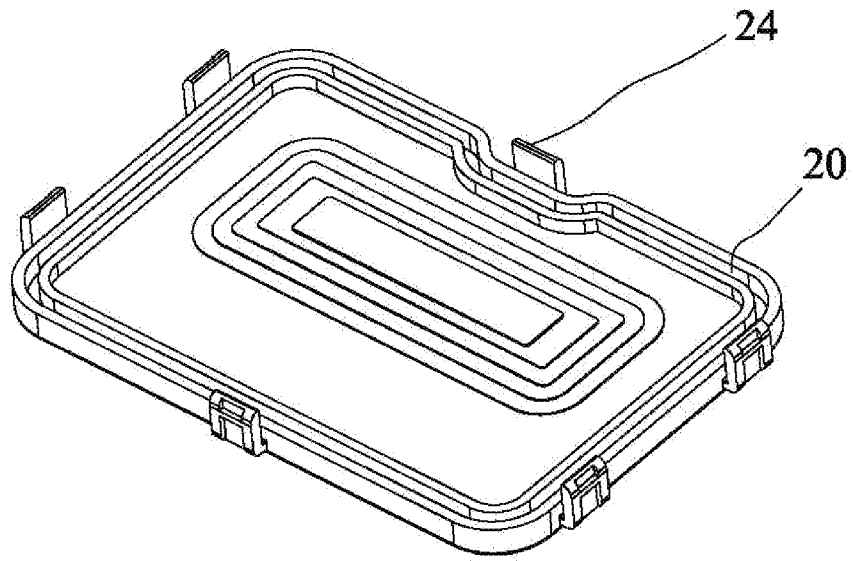


Fig. 4

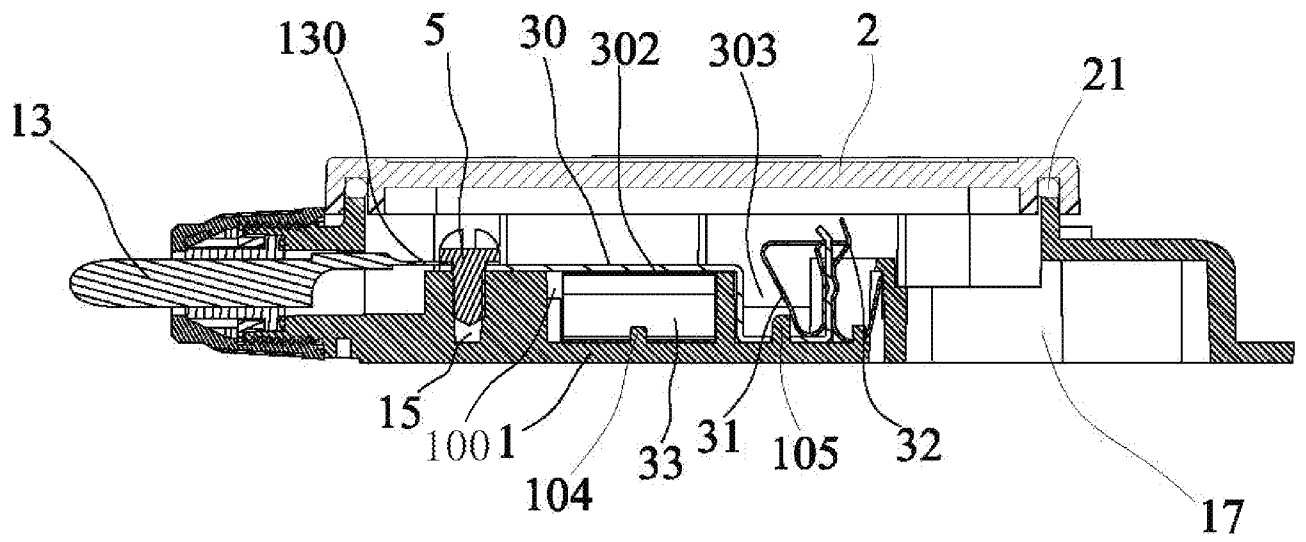


Fig. 5

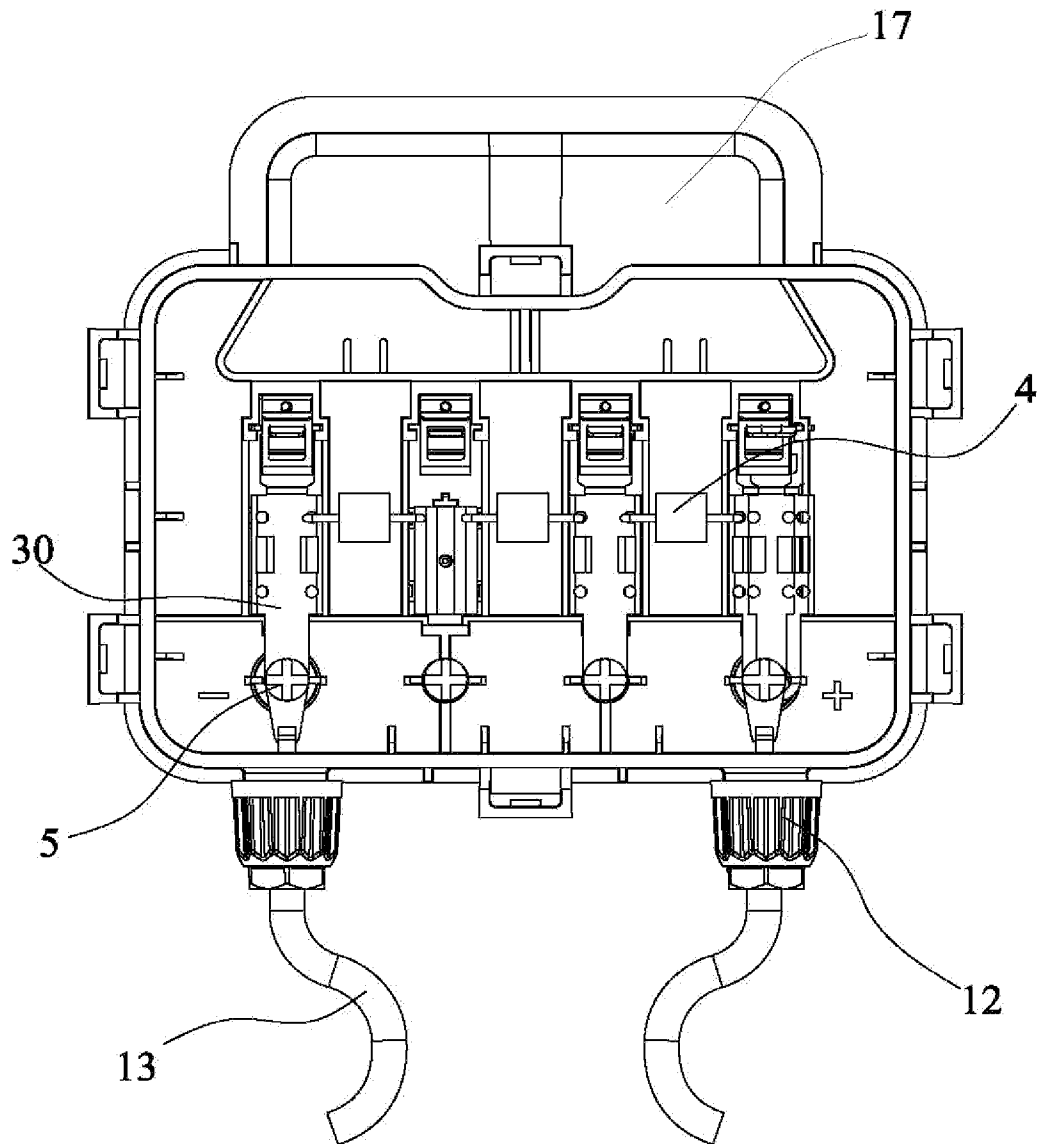


Fig. 6

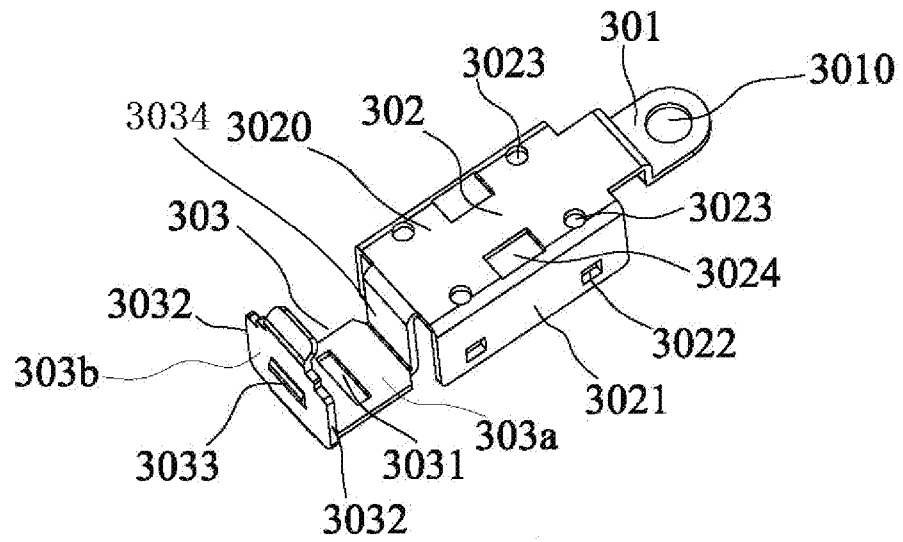


Fig. 7

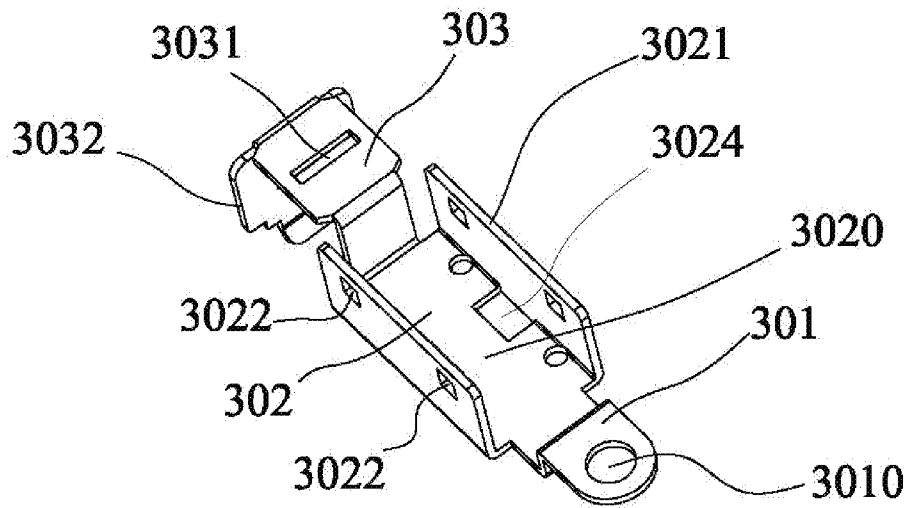


Fig. 8

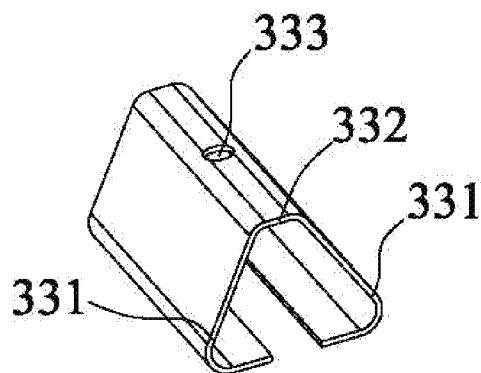


Fig. 9

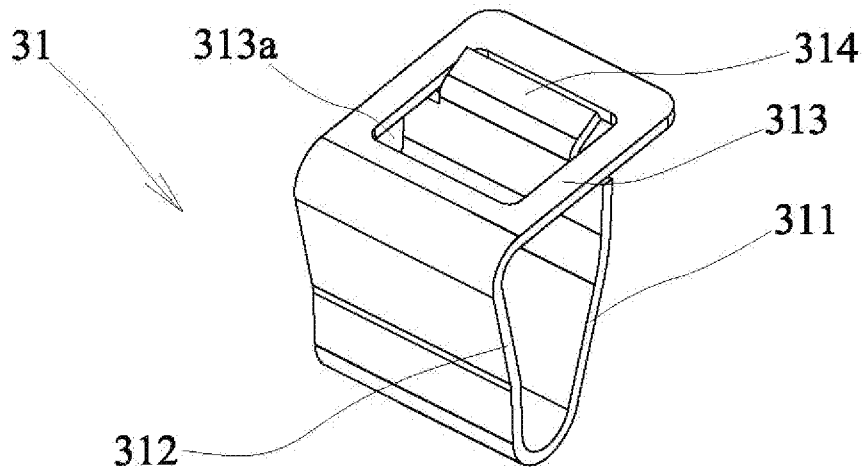


Fig.10

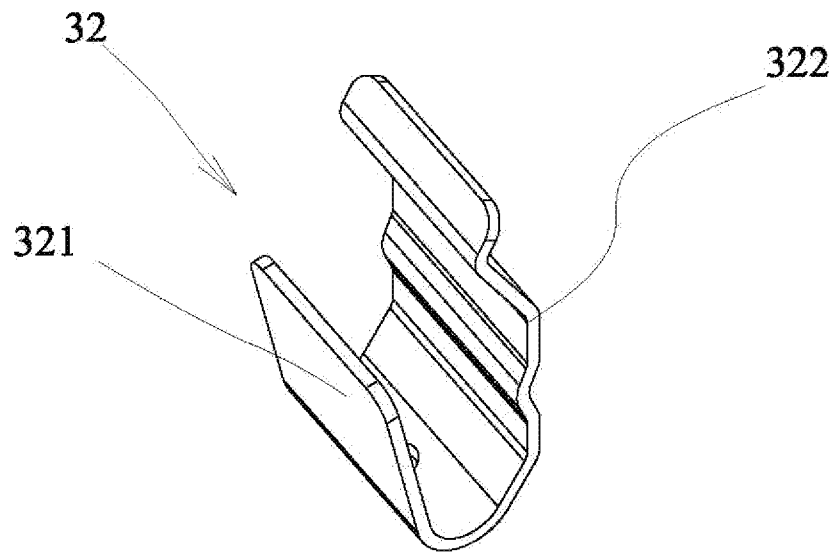


Fig.11

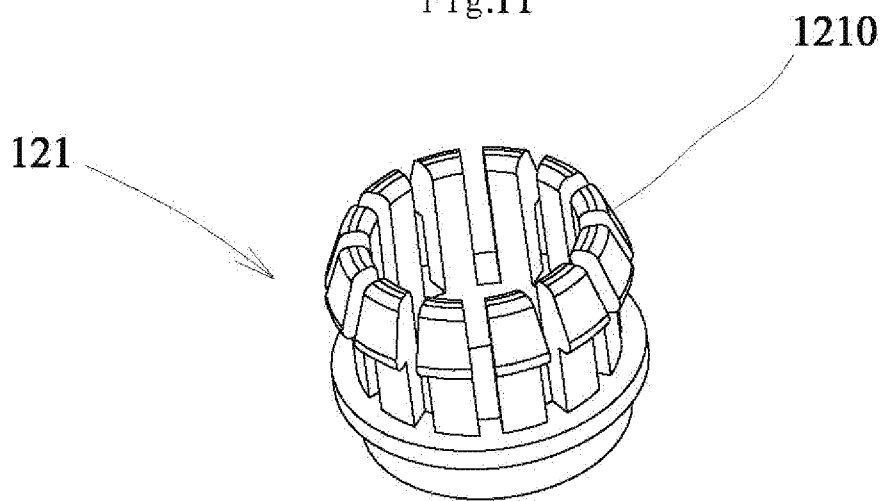


Fig.12

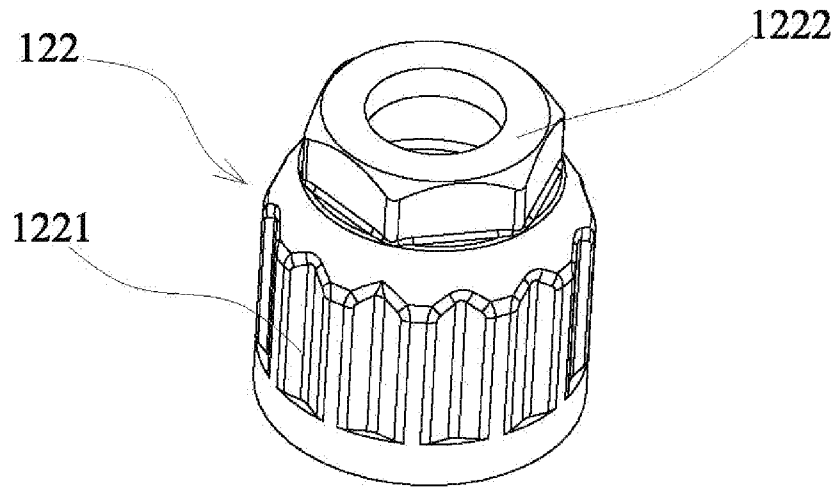


Fig. 13

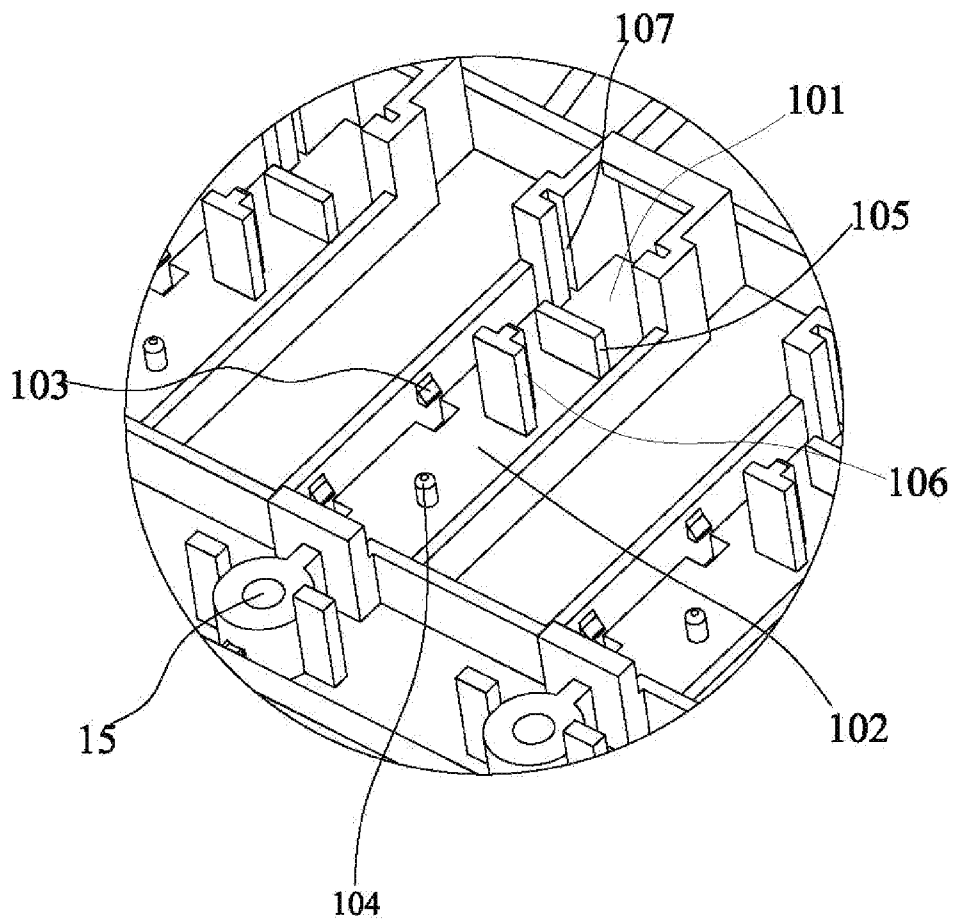


Fig. 14

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN201 1/075897

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: H01R, H01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNKI, CNPAT,WPI, EPODOC: solar, battery, cell, photovoltaic, box, diode, spring, elastic, resilient, clamp

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN201754409U(BYD COMPANY LIMITED) 02 Mar. 2011(02.03.2011) the whole document	1, 3-14
X	CN201256270Y(JIANGSU LINYANG ELECTRONIC CO LTD) 10 Jun. 2009(10.06.2009) pages 1-2 in the description, figs. 1-5	1
Y		2-3, 6, 12-14
A		4, 5, 7-11
Y	JP2009-206416A(KITANI DENKI KK) 10 Sep. 2009(10.09.2009) paragraphs 0014-0025 in the description, figs. 1-5	2-3, 6, 12-14
X	CN201063552Y(XIAMEN MAISHITONG ELECTRIC APPARATUS CO) 21 May 2008(21.05.2008) pages 1-3 in the description, figs. 1-4	1

Further documents are listed in the continuation of Box C.

See patent family annex.

<p>* Special categories of cited documents:</p> <p>“A” document defining the general state of the art which is not considered to be of particular relevance</p> <p>“E” earlier application or patent but published on or after the international filing date</p> <p>“L” document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>“O” document referring to an oral disclosure, use, exhibition or other means</p> <p>“P” document published prior to the international filing date but later than the priority date claimed</p>	<p>“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>“&” document member of the same patent family</p>
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/CN201 1/075897

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN201754409U	02.03.2011	None	
CN201256270Y	10.06.2009	None	
JP2009-206416A	10.09.2009	None	
CN201063552Y	21.05.2008	None	

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN20 11/075897

A. CLASSIFICATION OF SUBJECT MATTER

H01R 4/48 (2006.01) i

H01L 31/048 (2006.01) i