(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 320 523 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
18.07.2012 Bulletin 2012/29

(51) Int Cl.:
H01R 4/24 *(2006.01)* ***H01R 13/52*** *(2006.01)*

(21) Application number: **09174991.1**

(22) Date of filing: **04.11.2009**

(54) **Watertight junction box**

Wasserdichter Verteilerkasten

Boîtier de raccordement étanche à l'eau

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR

(43) Date of publication of application:
11.05.2011 Bulletin 2011/19

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EP 2 320 523 B1

Printed by Jouve, 75001 PARIS (FR)

Description

[0001] The present invention relates to junction boxes and more particularly to a watertight junction box, which facilitates rapid installation of wires and effectively prevents the permeation of water.

[0002] When connecting two electric wires together, the most commonly used method is to cut off the outer insulation of the connection end of each of the two electric wires, then to twist the bare metal conductors of the two electric wires together, and then to wrap the connection between the two electric wires with an insulative tape. Further, a junction box may be used for the connection of two electric wires.

[0003] US 5,499,931 discloses a lamp conducting structure in which power wires are pressed by the lower frame top central cylinder to cause the conductive metal clip sharp needle to cut off the outer insulations of the power wires to contact with the metal part of the power wires. This design is for indoor application, allowing the lamp to be easily connected with power wires of different thickness. However, this design cannot prevent the permeation of water. When used outdoor, rainwater may leak in, resulting in oxidation of the conductive metal clip sharp needle and shortening the work life.

[0004] GB 691802 A (see Figures 1-5) relates to an interconnector for a main and a branch insulated cable which comprises an insulating body 8 having coaxially-extending walls 9, 10 with diametrically-opposed slots 13, 14. Part of a main cable 6 lies between the wall 9 and a screw-cap 11, and part of a branch cable 7 lies between the wall 10 and a screw-cap 12, the inner ends of slots 13, 14 being grooved to receive the cables. Two metal plates 17, 18 are secured to the body by screws 19 with contact-points 20, two similar plates 21, 22 being secured by screws 23 with contact-points 24, two similar plates 21, 22 being secured by screws 23 with contact-points 24, A resistor 25 is connected between the plates 17, 22 and a resistor 26 between 18, 21. On screwing down the cap 11 the main cable 6 is pierced by points 20, the branch cable 7 being pierced by points 24 on screwing down the cap 12, one conductor of each cable now being connected together by the resistor 25, and the other two by resistor 26. The space round the contacts may be filled with a sealing compound, and securing lugs provided for the device. In other embodiments the resistors are replaced by inductors or capacitors which act as filters. When coaxial cables are used, the inner part of the contact-pins may be coated with a ceramic, and when the outer conductor is thick a hole may be drilled in it to enable the point to contact the inner conductor.

[0005] The present invention has been accomplished according to claim 1, under the circumstances in view. It is one object of the present invention to provide a watertight junction box, which utilizes a piece of silicon rubber to wrap about the connection area between the copper contacts and the installed power wire, protecting the copper contacts against oxidation and assuring a long service life and conductive stability.

[0006] It is another object of the present invention to provide a watertight junction box, which utilizes a piece of silicon rubber to assure watertight sealing and allows repeated use of the junction box without lowering its watertight sealing function.

FIG. 1 is an elevational view of a watertight junction box in accordance with the present invention.

FIG. 2 is an exploded view of the watertight junction box in accordance with the present invention.

FIG. 3 is a cross sectional view of the box body of the watertight junction box according to the present invention.

FIG. 4 is a sectional elevation of a part of the watertight junction box in accordance with the present invention.

FIG. 5 is an elevational view of a part of the present invention, showing the lower floating plate mounted in the accommodation chamber inside the box body.

FIG. 6 is a sectional side assembly view of a part of the watertight junction box in accordance with the present invention.

FIG. 7 is a schematic sectional view of the present invention before the lock cap is locked and before a contact is made between the copper contacts and the external power wire.

FIG. 8 corresponds to FIG. 7, showing the lock cap locked and the copper contacts cut into the external power wire.

FIG. 9 is an elevational view of the present invention, showing a relatively thinner external power wire installed in the junction box.

FIG. 10 is a sectional view in an enlarged scale of FIG. 9.

[0007] As shown in FIGS. 1-5, a watertight junction box in accordance with the present invention comprises a box body 1, a lower floating plate 2, an upper floating plate 3, a holding down plate 4a or 4b and a lock cap 5.

[0008] The box body 1 is a hollow member comprising a threaded neck 11, an opening 12 transversely cut through the threaded neck 11 to separate the threaded neck 11 into two symmetrical halves, an accommodation chamber 13 defined beneath the threaded neck 11 (see FIG. 2 and FIG. 3), an insertion hole 14 cut through one side of the accommodation chamber 13 for the insertion of a modular cable 6 into the accommodation chamber 13, a partition board 15 disposed inside the accommodation chamber 13 (see FIG. 3 and FIG. 4), two copper contacts 16 mounted in the accommodation chamber 13 at two sides relative to the partition board 15 and a plurality of ribs 17 located on the inside wall of each of the two symmetrical halves of the threaded neck 11. Further, each copper contact 16 has a plurality of sharp top protrusions 161. After the modular cable 6 is inserted into the insertion hole 14, the copper contacts 16 are respectively forced with the bottom edges thereof into contact

with the (conductors of the) modular cable 6, and then a resin glue 18 is filled in the accommodation chamber 13 so that the connection between the sharp copper contacts 16 and the modular cable 6 is embedded in the hardened resin glue 18 (see FIG. 6).

[0009] The lower floating plate 2 is a flat plate having two through holes 21 for the copper contacts 16 to pass through, two bottom legs 22 diagonally disposed at the bottom side and two springy supporting strips 23 diagonally disposed at the top side. The lower floating plate 2 is inserted into the accommodation chamber 13 of the box body 1 (see FIG. 5), enabling the two bottom legs 22 to be embedded in the resin glue 18 (see FIG. 6).

[0010] The upper floating plate 3 is a flat plate having two through holes 31 corresponding to the through holes 21 of the lower floating plate 2 for the copper contacts 16 to pass through and two notched side edges 32 fitting the ribs 17. The upper floating plate 3 is set inside the threaded neck 11 above the lower floating plate 2. Further, a suitable amount of silicon rubber 7 is filled in the accommodation chamber 13 in between the lower floating plate 2 and the upper floating plate 3 (see FIG. 6).

[0011] The holding down plate 4a or 4b is selectively used depending upon the thickness of the external electric wire 8a or 8b to be connected. The holding down plate 4a or 4b is a flat clamping plate having a substantially-shaped cross section and a vertical groove 42a or 42b on each of the two opposite lateral sidewalls 41a or 41b thereof for receiving one of the ribs 17 at each of the two symmetrical halves of the threaded neck 11.

[0012] The lock cap 5 is a screw cap for threading onto the threaded neck 11 of the box body 1, having an inside stop wall 51 that curves inwards (see FIG. 7 or FIG. 8).

[0013] The box body 1, the lower floating plate 2, the upper floating plate 3, the holding down plate 4a or 4b and the lock cap 5 are assembled to form the desired watertight junction box. As stated above, a certain amount of soft rubber, in particular silicon rubber 7, is filled in the accommodation chamber 13 in between the lower floating plate 2 and the upper floating plate 3. During installation, the external power wire 8a or 8b to be connected is set in opening 12 of the box body 1 and transversely extended through the threaded neck 11 and kept between the holding down plate 4a (or 4b) and the upper floating plate 3, and then the lock cap 5 is threaded onto the threaded neck 11 of the box body 1. When threading the lock cap 5 onto the threaded neck 11 of the box body 1, the inside stop wall 51 is forced downwardly against the holding down plate 4a (or 4b), causing the sharp top protrusions 161 of the copper contacts 16 to pierce the outer insulation 81 a or 81 b of the external power wire 8a or 8b (see FIG. 8 or FIG. 10) and to contact the respective conductors in the external power wire 8a or 8b. At this time, the silicon rubber 7 is compressed to seal the contact area between the copper contacts 16 and the external power wire 8a or 8b (see FIG. 8), thereby protecting the copper contacts 16 against oxidation and corrosion and achieving excellent watertight sealing effects.

[0014] The silicon rubber 7 is an elastic material that is able to return to its former shape after being pulled or pressed. After the external power wire 8a or 8b is removed, the silicon rubber 7 immediately returns to its former shape, filling up the space in the accommodation chamber 13 in between the lower floating plate 2 and the upper floating plate 3. Therefore, the watertight junction box of the present invention can be used repeatedly without lowering its watertight sealing function.

[0015] The holding down plate 4a or 4b is selectively used depending upon the thickness of the external power wire 8a or 8b to be connected. These two holding down plates 4a and 4b have the same structural design with the exception of the gap width between the two opposite lateral sidewalls 41a or 41b. For example, FIG. 9 shows a thinner external power wire 8b installed in the watertight junction box.

[0016] The modular cable 6 is an electrical cable having a modular connector, for example, modular jack 61 at its one end. The other end of the modular cable 6 is inserted through the insertion hole 14 into the accommodation chamber 13 with the two bare conductors separated by the partition board 15 and respectively held down in the accommodation chamber 13 by the copper contacts 16 and sealed by the resin glue 18. Due to the sealing effect of the resin glue 18, the connection between the copper contacts 16 and the modular cable 6 is assured. Further, the box body 1 has two locating grooves 19 defined in the accommodation chamber 13 at two sides relative to the partition board 15 for receiving the copper contacts 16 respectively.

[0017] The main feature of the present design is the filling of the silicon rubber 7 in the accommodation chamber 13. When the two copper contacts 16 pierce the outer insulations 81a or 81b and come into contact with the respective conductors 82a or 82b (see FIG. 8 or FIG. 10), the silicon rubber 7 is compressed and deformed to protrude over the through holes 31 of the upper floating plate 3 and to wrap about the contact area between the copper contacts 16 and the conductors 82a or 82b of the external power wire 8a or 8b, thereby protecting the copper contacts 16 against oxidation and corrosion and achieving excellent watertight sealing effects. Therefore, the invention prolongs the work life of the junction box and assures conductive stability.

[0018] Further, one single-piece hollow member may be used to substitute for the lower floating plate 2 and the upper floating plate 3 for holding a suitable amount of silicon rubber 7 for allowing the silicon rubber 7 to be compressed and deformed to wrap about the connection area between the copper contacts and the conductors of the external power wire, achieving excellent watertight sealing effects.

[0019] In summary there is disclosed a watertight junction box including a box body 1, a lower floating plate 2, an upper floating plate 3, a lock cap 5, a modular cable 6 inserted into the box body 1 and kept in contact with

sharp copper contacts 16. a holding down plate 4a or 4b for holding down an external power wire 8a or 8b on the upper floating plate 3 to cause electric contact between the external power wire 8a or 8b and the sharp copper contacts, 16 and a predetermined amount of silicon rubber 7 filled in between the lower and upper floating plate 3 that is deformed to wrap about the connection area between the sharp copper contacts 16 and the external power wire 8a or 8b when the lock cap 5 is tightly fastened to the box body 1 to force down the holding down plate 4a or 4b.

Claims

1. A watertight junction box, comprising:

a box body (1), said box body (1) comprising a threaded neck (11), an opening (12) transversely cut through said threaded neck (11) to separate said threaded neck (11) into two symmetrical halves for mounting an external power wire, an accommodation chamber (13) defined beneath said threaded neck (11), an insertion hole (14) cut through one side of said accommodation chamber (13), a modular cable (6) inserted through said insertion hole (14) into said accommodation chamber (13), and two sharp copper contacts (16) mounted in said accommodation chamber (13) at two sides and respectively kept in contact with said modular cable (6) electrically;

a lower floating plate (2) set in said accommodation chamber (13), said lower floating plate (2) having two through holes (21) for said sharp copper contacts (16) to pass through;

an upper floating plate (3) set in said accommodation chamber (13) above said lower floating plate (2), said upper floating plate (3) having two through holes (31) corresponding to the through holes (21) of said lower floating plate (2) for said sharp copper contacts (16) to pass through;

a predetermined amount of a soft rubber (7) filled in said accommodation chamber (13) in between said lower floating plate (2) and said upper floating plate (3);

a holding down plate (4a; 4b) set in said box body (1) and adapted to hold down an external power wire (8a; 8b) being set in said opening (12) of said box body (1) on said upper floating plate (3); and

a lock or screw cap (5) for threading onto said threaded neck (11) of said box body (1), said screw cap (5) comprising an inside stop wall (51);

wherein when said screw cap (5) is threaded onto said threaded neck (11) of said box body (1) after an external power wire (8a; 8b) is set in said opening (12) of said box body (1) between said upper floating plate (3) and said holding down plate (4a; 4b), said inside stop wall of said screw cap (5) is forced downwardly against said holding down plate (4a; 4b), said external power wire (8a; 8b), said soft rubber (7) and said lower floating plate (2), causing said sharp copper contacts (16) to cut into said external power wire (8a; 8b) and said soft rubber (7) to wrap about the connection area between said sharp copper contacts (16) and said external power wire (8a; 8b).

2. The watertight junction box as claimed in claim 1, wherein said box body (1) comprises a partition board (15) disposed inside said accommodation chamber (13); and said sharp copper contacts (16) are disposed in said accommodation chamber (13) at two sides relative to said partition board.

3. The watertight junction box as claimed in claim 1 or 2, wherein said threaded neck (11) comprises a plurality of longitudinal ribs (17) respectively protruding from an inside wall of each of the two symmetrical halves thereof.

4. The watertight junction box as claimed in claim 1, 2 or 3, further comprising a resin glue filled in said accommodation chamber (13) so that the connection area between said modular cable (6) and said two sharp copper contacts (16) is embedded therein.

5. The watertight junction box as claimed in claim 4, wherein said lower floating plate (2) comprises two bottom legs (22) diagonally disposed at a bottom side thereof and embedded in said resin glue and two springy supporting strips (23) diagonally disposed at a top side thereof for supporting said upper floating plate (3).

6. The watertight junction box as claimed in claim 4, wherein said upper floating plate (3) comprises two notched side edges (33) disposed at two opposite lateral sides thereof and configured to fit the internal configuration of said threaded neck (11) of said box body (1).

7. The watertight junction box as claimed in claim 3, wherein said holding down plate (4a; 4b) comprises a vertical groove (42a; 42b) located on each of two opposite vertical sidewalls (41a; 41b) thereof for receiving one of the longitudinal ribs (17) of said threaded neck (11).

8. The watertight junction box as claimed in one of the claims 1 to 7, wherein said holding down plate (4a; 4b) comprises two opposite vertical sidewalls (41a; 41b) said two opposite vertical sidewalls (41a; 41b)

defining therebetween a gap width equal to the thickness of the external power wire (8a; 8b) to be connected.

9. The watertight junction box as claimed in one of the claims 1 to 8, wherein said modular cable (6) has one end inserted through said insertion hole (14) into said accommodation chamber (13) and electrically connected via two bare conductors thereof to said sharp copper contacts (16) and an opposite end extending out of said box body (1) and terminating in a modular connector; and said box body (1) further comprises a resin glue filled in said accommodation chamber (13) so that the connection area between said modular cable (6) and said two sharp copper contacts (16) is embedded therein.

10. The watertight junction box as claimed in one of the claims 1 to 9, wherein said box body (1) further comprises two locating grooves (19) for mounting said sharp copper contacts (16).

11. The watertight junction box as claimed in claim 4, wherein said soft rubber (7) is a silicon rubber that returns to its former shape after being pressed.

Patentansprüche

1. Wasserdichte Verteilerdose, aufweisend:

einen Dosenkörper (1), wobei der Dosenkörper einen Gewinde-Hals (11) aufweist, eine Öffnung (12) aufweist, die den Gewinde-Hals (11) quer durchschneidet, um den Gewinde-Hals (11) in zwei symmetrische Hälften zur Montage eines externen Strom-Kabels zu trennen, eine Aufnahme-Kammer (13) aufweist, die unterhalb des Gewinde-Halses (11) vorgesehen ist, ein Einführ-Loch (14) aufweist, das eine Seite der Aufnahme-Kammer (13) durchschneidet, wobei ein modulare Kabel (6) durch das Einführ-Loch (14) in die Aufnahme-Kammer (13) einführbar ist, und wobei zwei scharfe Kupfer-Kontakte (16), die in der Aufnahme-Kammer (13) an zwei Seiten mondert sind, jeweils elektrisch in Kontakt mit dem modularen Kabel (6) gehalten sind;
eine untere potentialfreie Platte (2), die in die Aufnahme-Kammer (13) eingesetzt ist, wobei die untere potentialfreie Platte zwei Durchgangs-Löcher (21) zum Durchführen der scharfen Kupfer-Kontakte (16) aufweist;
eine obere potentialfreie Platte (3), die in der Aufnahme-Kammer (13) oberhalb der unteren potentialfreien Platte (2) eingesetzt ist, wobei die obere potentialfreie Platte (3) zwei Durchgangs-Löcher (31) passend zu den Durchgangs-Löchem (21) der unteren potentialfreien Platte (2) zum Durchführen der scharfen Kupfer-Kontakte (16) aufweist;
eine vorgegebene Menge an Weichgummi (7), das in die Aufnahme-Kammer (13) zwischen der unteren potentialfreien Platte (2) und der oberen potentialfreien Platte (2) eingefüllt ist;
eine Niederhalter-Platte (4a, 4b), die in dem Dosengehäuse (1) eingesetzt und angepasst ist, ein externes Stroxn-Kabel (8a, 8b) niederzuhalten, das in die Öffnung (12) des Dosengehäuses (1) auf der oberen potentialfreie Platte (3) eingesetzt ist; und eine Verschluss- oder Schraub-Kappe (5) zum Aufbringen auf den Gewinde-Hals (11) des Dosengehäuses (1), wobei die Schraub-Kappe (5) eine innere Anschlag-Wand (51) aufweist;
wobei, wenn die Schraub-Kappe (5) auf dem Gewinde-Hals (11) des Dosengehäuses (1) aufgebracht ist nachdem ein externes Strom-Kabel (8a; 8b) in die Öffnung (12) des Dosengehäuses (1) zwischen die obere potentialfreie Platte (3) und die Niederhalter-Platte (4a; 4b) eingesetzt ist, die innere Anschlag-Wand der Schraub-Kappe (5) nach unten gegen die Niederhalter-Platte (4a, 4b), das externe Strom-Kabel (8a; 8b), das Weichgummi (7) und die untere potentialfreie Platte (2) gezwungen wird, was bewirkt, dass die scharfen Kupfer-Kontakte (16) in das externe Strom-Kabel (8a; 8b) einschneiden und das Weichgummi (7) den zwischen den scharfen Kupfer-Kontakten (16) und dem externen Strom-Kabel (8a; 8b) bestehenden Verbindungsbereich umhüllt.

2. Wasserdichte Verteilerdose nach Anspruch 1, wobei das Dosengehäuse (1) eine Trennwand (15) aufweist, die in der Aufnahme-Kammer (13) angeordnet ist; und wobei die scharfen Kupfer-Kontakte (16) in der Aufnahme-Kammer (13) an zwei Seiten relativ zu der Trennwand angeordnet sind.

3. Wasserdichte Verteilerdose nach Anspruch 1 oder 2, wobei der Gewinde-Hals (11) eine Vielzahl von Längs-Rippen (17) aufweist, die von der inneren Wandung einer jeden der zwei symmetrischen Hälften abstehen.

4. Wasserdichte Verteilerdose nach Anspruch 1, 2 oder 3, ferner umfassend einen Harz-Klebstoff, der in die Aufnahme-Kammer (13) eingefüllt ist, so dass der Verbindungsbereich zwischen dem modularen Kabel (6) und den zwei-scharfen Kupfer-Kontakten (16) darin eingebettet ist.

5. Wasserdichte Verteilerdose nach Anspruch 4, wobei die untere potentialfreie Platte (2) zwei unteren Schenkel (22) aufweist, die diagonal an einer unteren Seite davon angeordnet und in den Harz-Kleb-

stoff eingebettet sind, und zwei federnde Stützleisten (23) aufweist, die diagonal an einer Oberseite davon zum Tragen der oberen potentialfreien Platte (3) angeordnet sind.

6. Wasserdichte Verteilerdose nach Anspruch 4, wobei die obere potentialfreie Platte (3) zwei eingekerbte Seiten-Kanten (33) aufweist, die an zwei gegenüberliegenden seitlichen Seiten davon angeordnet und beschaffen sind, den inneren Aufbau des Gewinde-Halses (11) des Dosengehäuses (1) anzupassen.

7. Wasserdichte Verteilerdose nach Anspruch 3, wobei die Niederhalter-Platte (4a; 4b) eine vertikale Nut (42a; 42b) aufweist, die an jeder der zwei gegenüberliegenden vertikalen Seitenwände (41a; 41b) davon angeordnet ist, um eine der Längs-Rippen (17) des Gewinde-Halses. (11) aufzunehmen.

8. Wasserdichte Verteilerdose nach einem der Ansprüche 1 bis 7, wobei die Niederhalter-Platte (4a; 4b) zwei gegenüberliegende vertikale Seitenwände (41a; 41b) aufweist, wobei die zwei gegenüberliegenden vertikalen Seitenwände (41a; 41b) dazwischen eine Lücken-Weite ausbilden, die gleich zu der Dicke des anzuschließenden externen Strom-Kabels (8a; 8b) ist.

9. Wasserdichte Verteilerdose nach einem der Ansprüche 1 bis 8, wobei das modulare Kabel (6) ein Ende aufweist, das durch das Einführ-Loch (14) in die Aufnahme-Kammer (13) eingeführt und elektrisch über zwei abisolierte Leiter mit den scharfen Kupfer-Kontakten (16) verbunden ist, und ein gegenüberliegendes Ende aufweist, das aus dem Dosengehäuse (1) herausragt und in einem modularen Steckverbinder endet; und wobei das Dosengehäuse (1) ferner einen Harz-Klebstoff aufweist, der in die Aufnahme-Kammer (13) eingefüllt ist, so dass der Verbindungsbereich zwischen dem modularen Kabel (6) und den zwei scharfen Kupfer-Kontakten (16) darin eingebettet ist.

10. Wasserdichte Verteilerdose nach einem der Ansprüche 1 bis 9, wobei das Dosengehäuse (1) ferner zwei Anlagenuten (19) zum Montieren der scharfen Tupfer-Kontakte (16) aufweist.

11. Wasserdichte Verteilerdose nach Anspruch 4, wobei das Weichgummi (7) ein SilikonKautschuk ist, der in seine ursprüngliche Form zurückkehrt, nachdem er gepresst wurde.

Revendications

1. Un boîtier de raccordement étanche à l'eau, comprenant:

un corps de boîte (1), ledit corps de boîte (1) comprenant un col fileté (11), une ouverture (12) coupant transversalement ledit col fileté (11) pour séparer ledit col fileté (11) en deux moitiés symétriques pour le montage d'un câble d'alimentation externe, une cavité de logement (13) définie à l'intérieur dudit col fileté (11), un orifice d'insertion (14) traversant un côté de ladite cavité de logement (13), un câble modulaire (6) inséré au travers de l'orifice d'insertion (14) à l'intérieur de ladite cavité de logement (13), et deux contacts de cuivre pointus (16) montés au sein de ladite cavité de logement (13) en deux côtés et respectivement maintenus en contact électrique avec ledit câble modulaire (6);
une plaque libre inférieure (2) disposée dans ladite cavité de logement (13), ladite plaque libre inférieure (2) ayant deux trous de passage (21) pour le passage desdits contacts de cuivre pointus (16);
une plaque libre supérieure (3) disposée dans ladite cavité de logement (13) au-dessus de ladite plaque libre inférieure (2), ladite plaque libre supérieure (3) ayant deux trous de passage (31) correspondant aux trous de passage (21) de ladite plaque libre inférieure (2) pour le passage desdits contacts de cuivre pointus (16);
une quantité prédéterminée de caoutchouc souple (7) remplissant ladite cavité de logement (13) entre ladite plaque libre inférieure (2) et ladite plaque libre supérieure (3);
une plaque inférieure de retenue (4a; 4b) disposée dans ledit corps de boîte (1) et adaptée pour la tenue d'un câble d'alimentation externe (8a, 8b) fixée dans ladite ouverture (12) dudit corps de boîte (1) sur ladite plaque libre supérieure (3); et
un couvercle de verrouillage (5) pour le filetage sur le col fileté (11) dudit corps de boîte (1), ledit couvercle de verrouillage (5) comportant une paroi d'arrêt interne (51);
dans lequel ledit couvercle de verrouillage (5) est fileté sur ledit col fileté (11) dudit corps de boîte (1) après la disposition d'un câble d'alimentation externe (8a; 8b) dans ladite ouverture (12) dudit corps de boîte (1) entre ladite plaque libre supérieure (3) et ladite plaque inférieure de retenue (4a, 4b), ladite paroi d'arrêt interne (51) dudit couvercle de verrouillage (5) étant pressé vers le bas contre ladite plaque inférieure de retenue (4a; 4b), ledit câble d'alimentation externe (8a; 8b), ledit caoutchouc souple (7) et ladite plaque libre inférieure (2) entraînant lesdits contacts en cuivre pointus à mordre dans le câble d'alimentation externe (8a; 8b) et ledit caoutchouc souple (7) recouvrant la zone de connexion entre les contacts en cuivre pointus (16) et ledit câble d'alimentation externe.

2. Le boîtier de raccordement étanche à l'eau tel que revendiqué dans la revendication 1, dans lequel ledit corps de boîte (1) comporte un élément de partitionnement (15) disposé à l'intérieur de ladite cavité de logement (13); et lesdits contacts en cuivre pointus sont disposés dans ladite cavité de logement (13) aux deux côtés par rapport à l'élément de partitionnement.

3. Le boîtier de raccordement étanche à l'eau tel que revendiqué dans la revendication 1 ou 2, dans lequel ledit col fileté (11) comporte plusieurs nervures (17) respectivement en saillie par rapport une paroi interne de chacune des deux moitiés symétriques.

4. Le boîtier de raccordement étanche à l'eau tel que revendiqué dans la revendication 1, 2 ou 3, comportant en outre une colle résineuse remplissant la cavité de logement (13) de telle manière que la zone de connexion entre ledit câble modulaire (6) et lesdits double contacts en cuivre pointus (16) s'y trouve contenue.

5. Le boîtier de raccordement étanche à l'eau tel que revendiqué dans la revendication 4, dans lequel ladite plaque libre inférieure (2) comporte deux jambes inférieures (22) disposées en diagonale sur un côté inférieur et contenue dans ladite colle résineuse et deux bandes de soutien élastiques (23) disposées en diagonale sur un côté supérieur de façon à soutenir ladite plaque libre supérieure (3).

6. Le boîtier de raccordement étanche à l'eau tel que revendiqué dans la revendication 4, dans lequel ladite plaque libre supérieure (2) comprend deux arêtes latérales entaillées (33) disposées aux deux côtés latéraux et adapté à la configuration interne dudit col fileté (11) dudit corps de boîte (11).

7. Le boîtier de raccordement étanche à l'eau tel que revendiqué dans la revendication 3, dans lequel ladite plaque inférieure de retenue (4a; 4b) comporte un creux vertical (42a; 42b) disposé sur chacune des deux parois verticales opposées (41a; 41b) pour la réception d'une nervure longitudinale (17) dudit col fileté (11).

8. Le boîtier de raccordement étanche à l'eau tel que revendiqué dans l'une des revendications 1 à 7, dans lequel ladite plaque inférieure de retenue (4a; 4b) comporte deux parois verticales opposées (41a; 41b), lesdites parois verticales opposées séparant un orifice dont l'espacement est égal à l'épaisseur du câble d'alimentation externe (8a; 8b) devant être connecté.

9. Le boîtier de raccordement étanche à l'eau tel que revendiqué dans l'une des revendications 1 à 8, dans lequel ledit câble modulaire (6) comporte une extrémité insérée au travers de l'orifice d'insertion (14) dans ladite cavité de logement (13) et électriquement connecté au moyen de deux conducteurs nus aux contacts en cuivre pointus (16) et une extrémité opposée s'étendant dudit corps de boîte (1) et s'achevant en un connecteur modulaire; et ledit corps de boîte (1) comportant en outre une colle résineuse remplissant ladite cavité de logement (13) de telle manière que la zone de connexion entre ledit câble modulaire (6) et lesdits deux contacts en cuivre pointus (16) s'y trouve contenue;

10. Le boîtier de raccordement étanche à l'eau tel que revendiqué dans l'une des revendications 1 à 9, dans lequel ledit corps de boîte (1) comporte en outre deux encoches de positionnement (19) pour le montage desdits contacts en cuivre pointus (18).

11. Le boîtier de raccordement étanche à l'eau tel que revendiqué dans la revendication 4, dans lequel ledit caoutchouc souple (7) est un caoutchouc silicone revenant à sa forme originelle après compression.

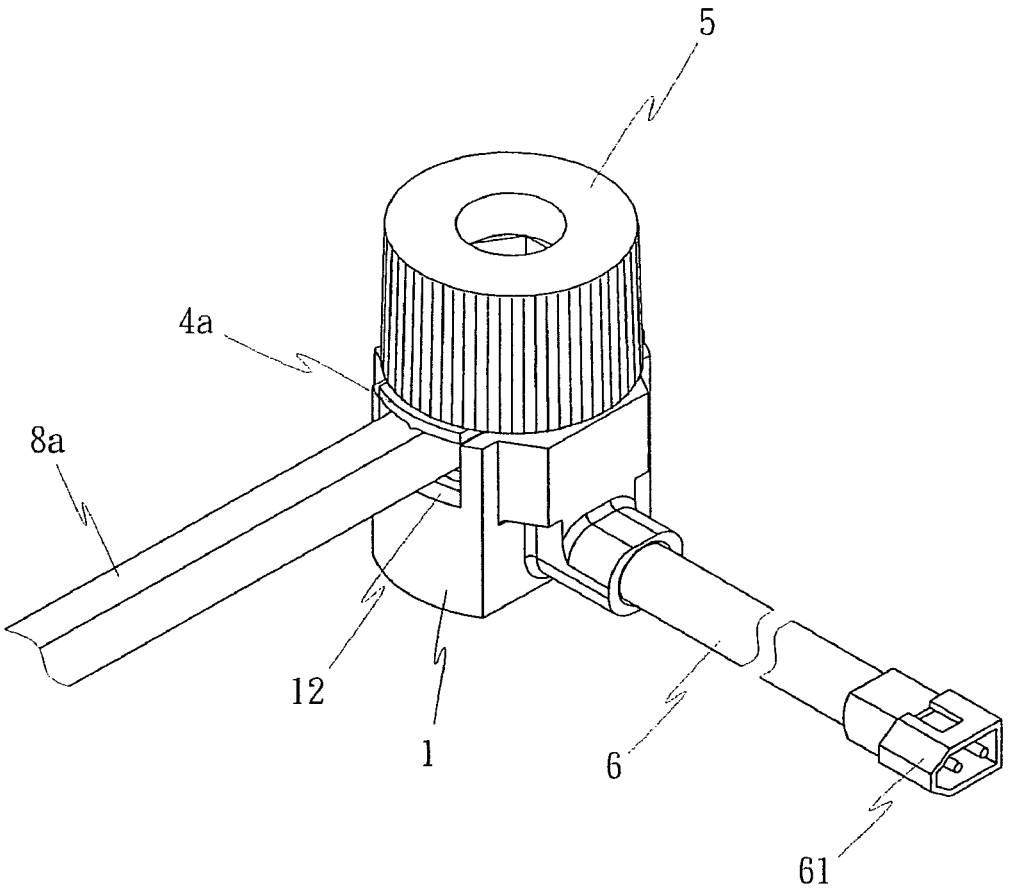


FIG. 1

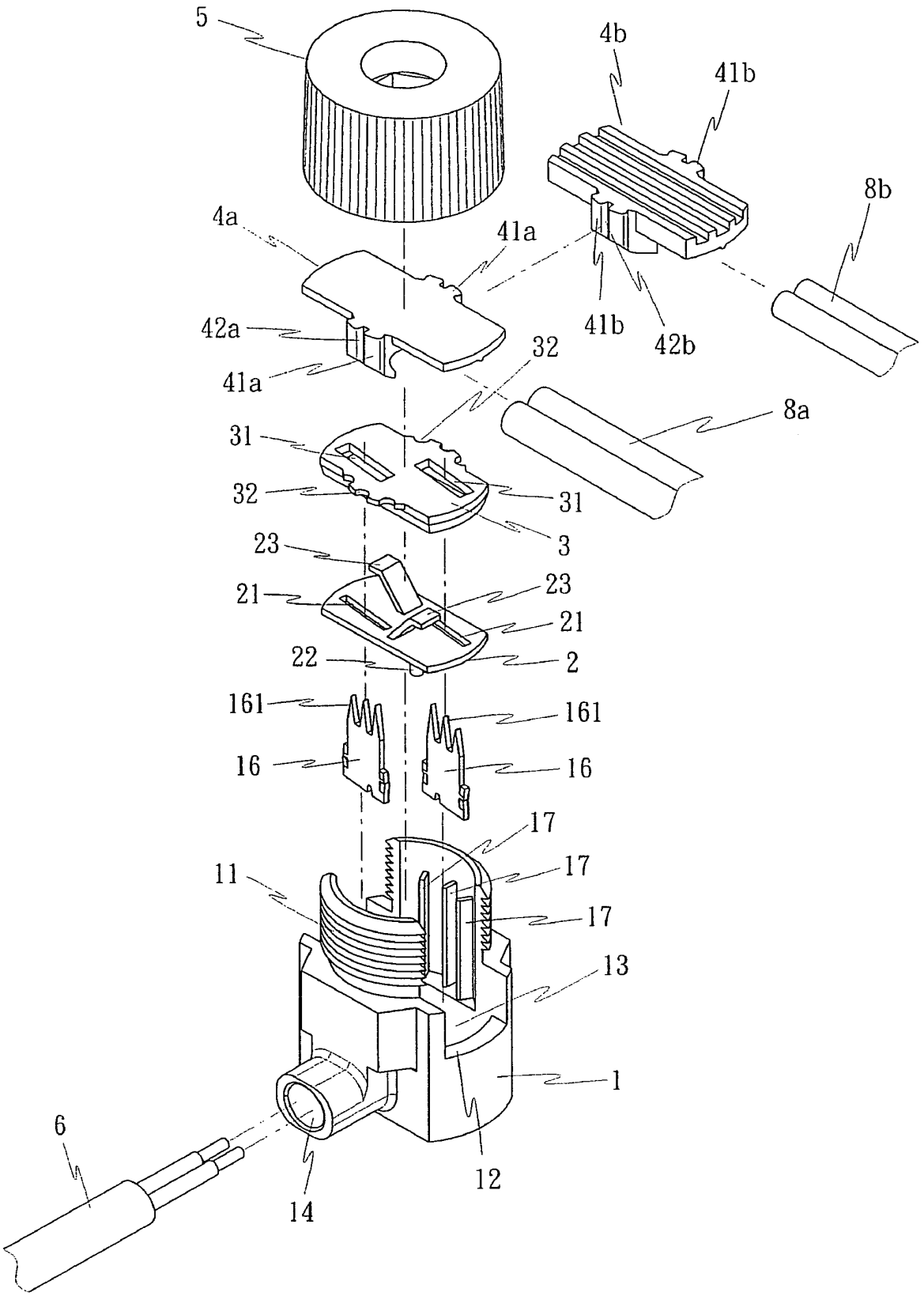

5
4b
41b
8b
4a
41a
42a
41a
41b
42b
32
8a
31
32
31
3
23
21
23
21
22
2
161
161
16
16
17
17
11
17
13
1
6
14
12

FIG. 2

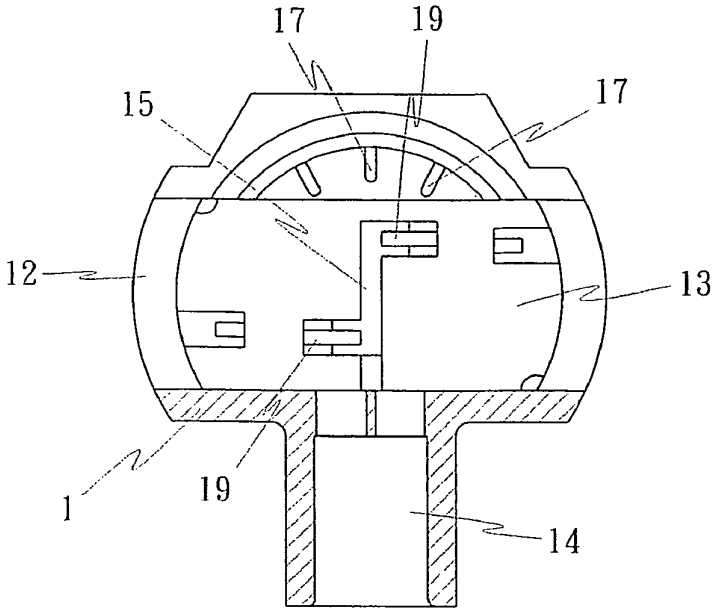


FIG. 3

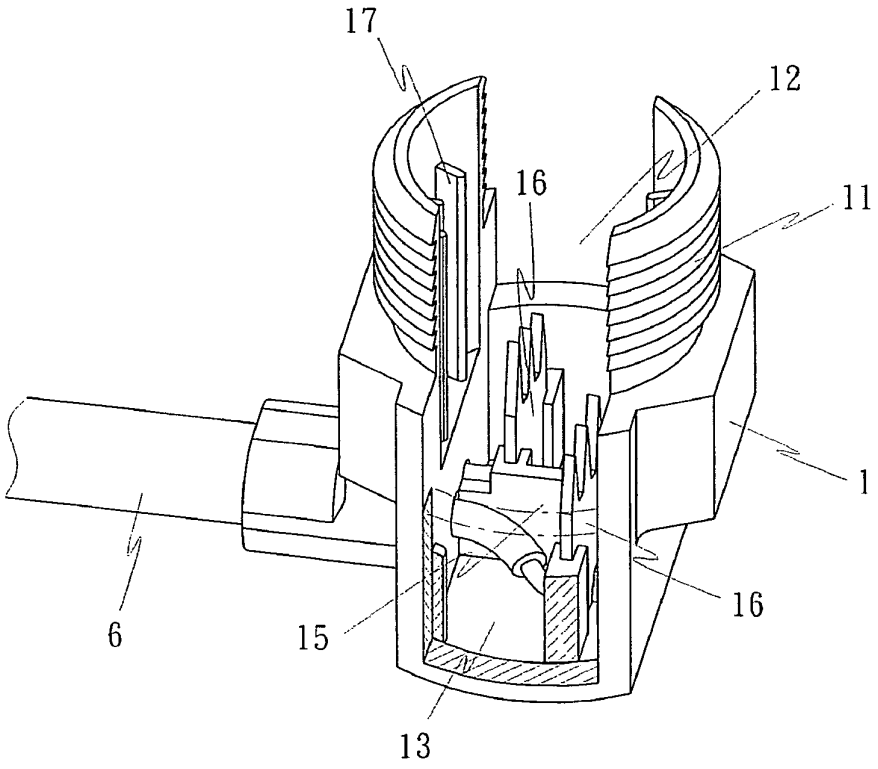


FIG. 4

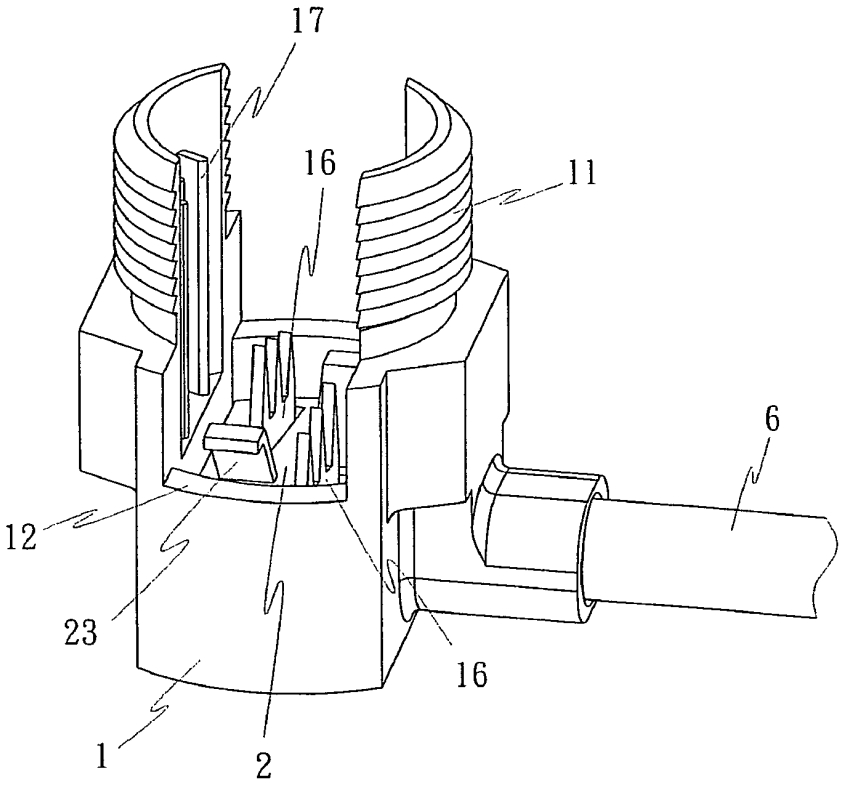


FIG. 5

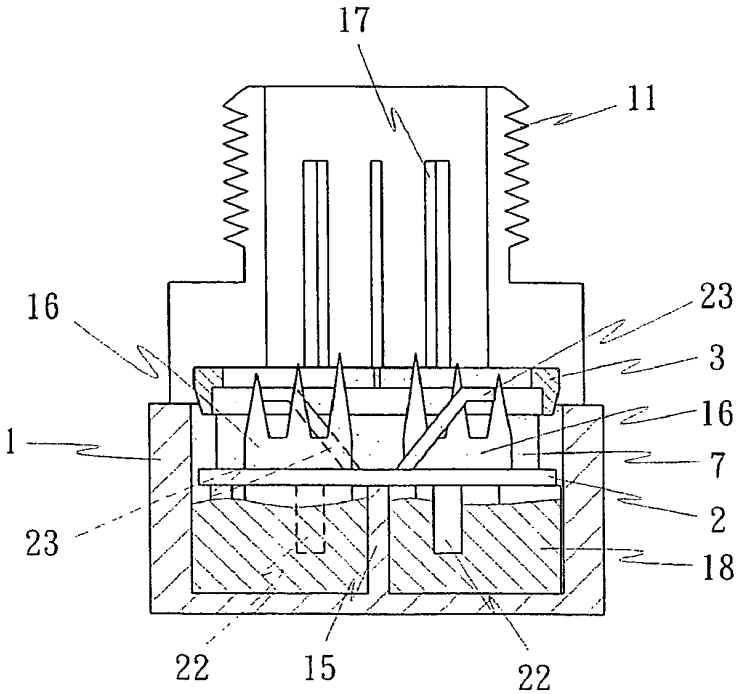


FIG. 6

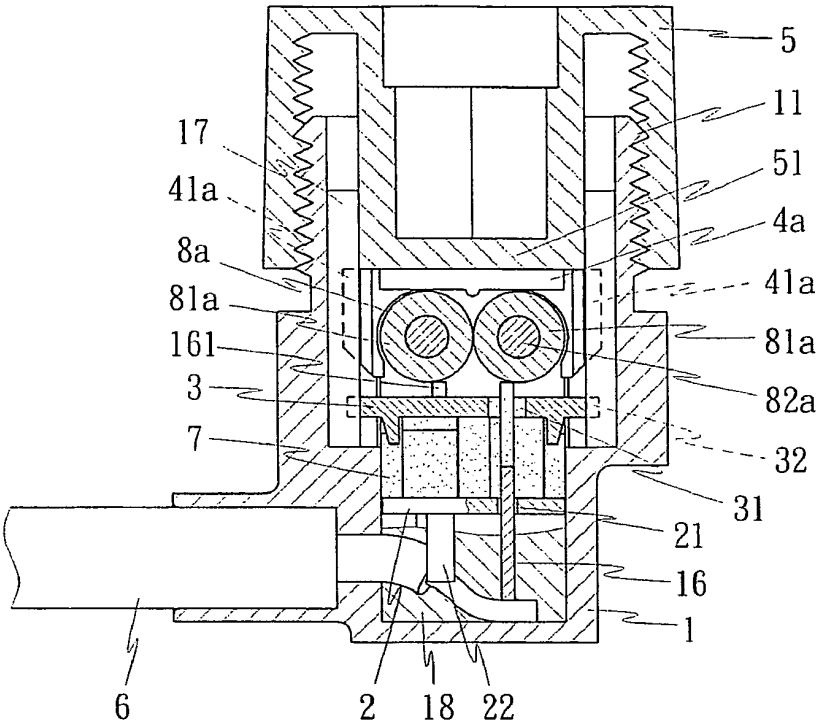

5
11
17
51
41a
4a
8a
41a
81a
81a
161
82a
3
32
7
31
21
16
1
6
2
18
22

FIG. 7

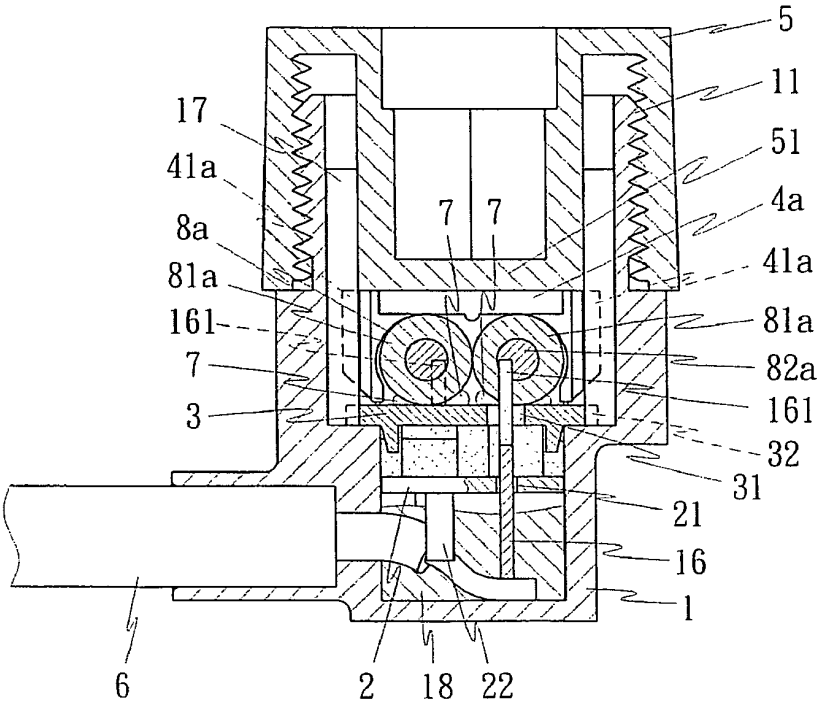

5
11
17
51
41a
4a
7
7
8a
41a
81a
81a
161
82a
7
161
3
32
31
21
16
1
6
2
18
22

FIG. 8

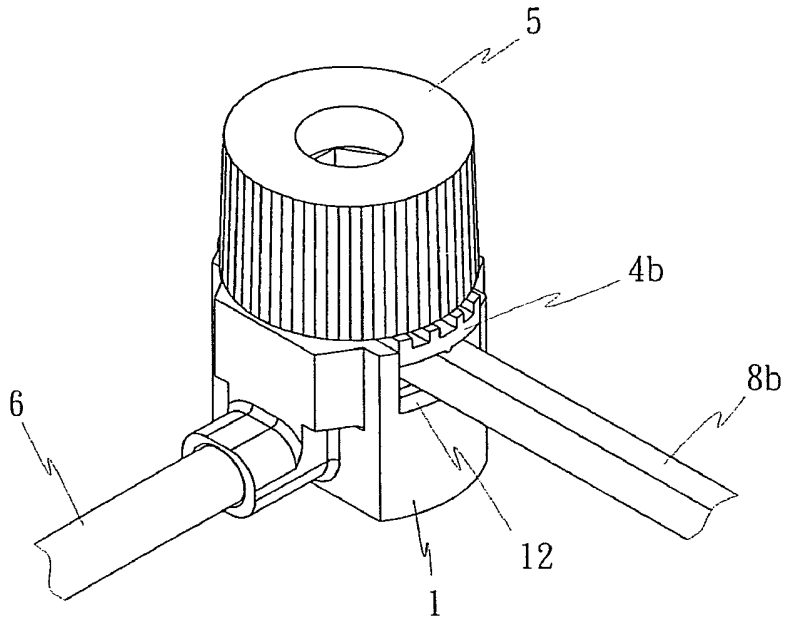

5
4b
8b
6
12
1

FIG. 9

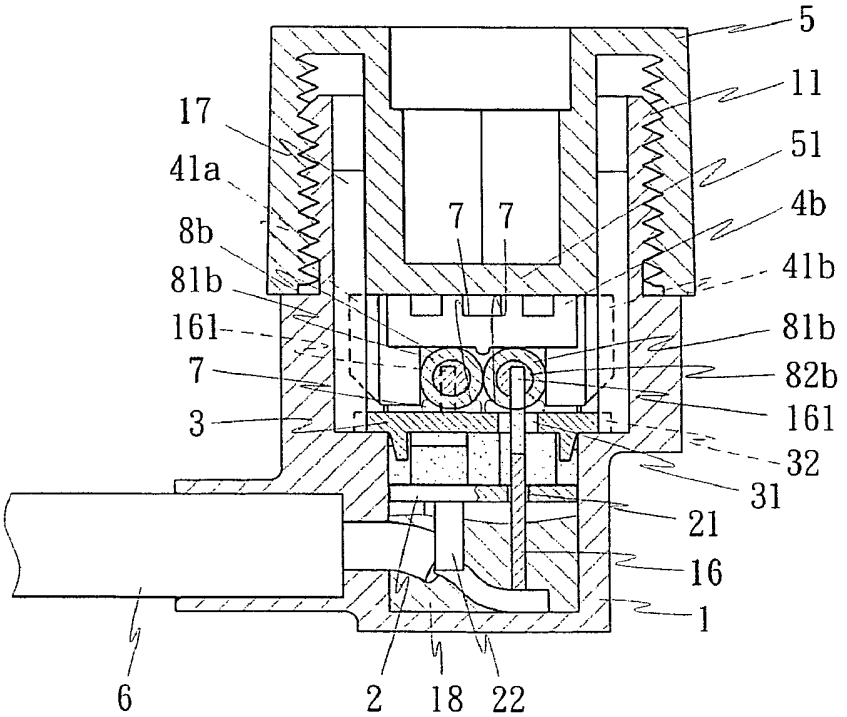

5
11
17
51
41a
4b
7
7
8b
41b
81b
81b
161
82b
7
161
3
32
31
21
16
1
6
2
18
22

FIG. 10

REFERENCES CITED IN THE DESCRIPTION

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