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(54) **CIRCULAR RAPID-JOINT CONNECTOR**

KREISFÖRMIGER SCHNELLGELENKVERBINDER

CONNECTEUR RAPIDE CIRCULAIRE

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Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The invention is a circular rapid-joint connector, particularly relating to one which may be in direct docking with a connection socket by a connector plug when using, such that effects of rapid joint, solid joining, rapid disassembling, simple structure and facile of use are accomplished.

Descriptions of the Related Art

[0002] Conventionally, the "Circular Connector", U.S. patent US 6,517,373 B2, includes a first connector element and a second connector element each of which has a first contact inset or a respective second contact inset in which, around the first contact inset of the first connector element, a sleeve-shaped latch segment is arranged from which, running along the longitudinal direction of the connector, one or more resilient latch flanges with latch tabs are formed that are appropriate for locking onto a ring-shaped groove formed on the inner side of the second connector element (locking position) and in which the first connector element includes an outer directly manually operated sleeve-shaped actuation slide, which can be slid back against a spring force along the longitudinal direction of the connector (unlocking position) and is adapted to actuate one or more sliding supports as locking elements, which can be slid along the longitudinal direction of the connector under a section of the latch flanges and are appropriate for supporting the latch flanges (locking position), characterized in that the latch flanges formed from the latch segment are integrally fixed to an end thereof in a manner ending rearwardly toward the actuation slide, that the sliding supports are formed from an end of the actuation slide and are directed directly toward the free ends of the latch segments, wherein the sliding supports extend from outside of the latch flanges essentially beneath their free ends only, when the actuation slide is pushed forward under the force of the spring.

[0003] From the cited patent described above, after the plug and the socket are docked, the actuation slide has to be pushed further in order for inserting the sliding supports beneath the latch flanges, such that the latch tabs are pushed and fastened into the ring-shaped groove, so that the operation of insertion and latching may be accomplished. As a result, cumbersome insertion procedure and complex structure will inhibit rapid connection in use of the conventional connector.

[0004] Documents US 6517373 B2, US 6464526 B1, US 4017139 A, WO 92/08259 A1 and DE 102006040254 A1 disclose plug-socket-systems having circular plugs and sockets. In all of these plug-socket-systems the plugs can be fixed on a socket and can be released from the socket by means of latches being arranged on the

plug and a sleeve being axially movable on the plug so as to act on the latches.

[0005] Furthermore, from document US 5 176 533 A an electrical connector is known, which includes a connector receptacle, the connector receptacle having a contact and a cylindrical socket formed with a radially inwardly extending stopper and axially extending slits, and a connector plug having a contact, a plug body formed in the outer circumference with an anchoring recess to be fitted with the stopper, a coupling arranged on the plug body to be able to retract rearwards, and a slide ring arranged axially movably between the plug body and the coupling and forwardly urged by a spring arranged between the slide ring and the plug body to cover the anchoring recess by the forward end of the slide ring. The distance between the forward ends of the contacts is larger than the distance between the forward ends of the stopper and the slide ring, but less than the distance between the stopper and the anchoring recess. When the connector plug is inserted into the connector receptacle, the contacts do not electrically contact each other yet at the moment when the stopper has abutted against the forward end of the slide ring, while the contacts electrically contact each other when the stopper has fitted in the anchoring recess to lock the connector receptacle and the connector plug. Document US 2005/0250365 A1 further discloses an electrical connector including an electrical plug having a threaded sleeve for screwing on a union nut of an electrical socket or for screwing into a stationary housing component of an electronic device. The union nut includes an internal thread configured for threaded engagement with the external thread of the plug.

[0006] In view of this, the inventor has researched and developed a circular rapid-joint connector in order to improve the above conventional connector with respect to various shortages thereof.

SUMMARY OF THE INVENTION

[0007] For a major objective of the invention, in assembling, direct docking with the corresponding connection socket by the connector plug is available for the connection socket to push away the sliding bush. After the connection socket and the connector plug are snap-fitting, the sliding bush is pushed back by the elastic element automatically, such that the sliding bush is locked to the outer edge of the connection socket to complete action of assemblage. In disassembling, the sliding bush is pulled backwards such that the sliding bush is not limited to the outer edge of the connection socket any more. After that, a force may be applied to remove the connector plug from the connection socket directly, so that the effects of rapid assembling, solid joining, rapid disassembling, simple structure and facile of use are accomplished.

[0008] In order to achieve the objective described above, a circular rapid-joint connector with the features

of claim 1 is provided. Further embodiments are subject-matter of the dependent claims.

[0009] Another objective of the invention is that, in assembling, direct docking with a corresponding connection socket by a connector plug is available for the connection socket to push away a sliding bush. After the connection socket and the connector plug are snap-fitting, the sliding bush is pushed back by an elastic element automatically, such that the sliding bush is locked in the outer edge of the connection socket to complete action of assemblage. In disassembling, the sliding bush is pulled backwards such that the sliding bush is not limited in the outer edge of the connection socket any more. After that, a force may be applied to remove the connector plug from the connection socket directly, and the fitting of the extension sections, the recession areas and the limiting unit may result for the sliding bush to be locked without rotation, so that the effects of being capable of rapid assembling, solid joining, rapid disassembling, simple structure and facile of use are accomplished.

[0010] In order to achieve the above objectives, the invention is a circular rapid-joint according to claim 1, which may also comprise: a sliding bush with multiple extension sections and recession areas provided on an end thereof; the outer edge of the holding unit having a limiting unit capable of limiting each of the extension sections.

[0011] The holding unit may further comprise a clip provided outside of the collar and constricted by the locking bush joining with the sleeve, while the limiting unit is provided on the outer edge of the sleeve.

[0012] The limiting unit may comprise multiple bumps, each of which mates with the respective recession area, and the bumps are formed with a respective limiting slot therebetween for each of the extension sections to mate with.

[0013] The limiting unit may comprise a rib ring provided on the sleeve, and multiple insertion slots which are docked with the respective extension sections are provided thereon.

[0014] The limiting unit may comprise multiple prolonged plates, each of which mates with the respective recession area, and the prolonged plates are formed with a respective groove therebetween for each of the extension sections to mate with.

[0015] An end of the clip may have multiple adjacent clamping sheets.

[0016] The edge of the clip may have a notch portion.

[0017] The inner surface of each of the elastic pieces may be provided with a stop ring.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018]

Figure 1 is a schematic diagram showing the appearance of the first embodiment.

Figure 2 is an exploded schematic diagram showing elements of the first embodiment.

Figure 3 is another exploded schematic diagram showing elements of the first embodiment.

Figure 4 is a schematic diagram showing a cross section of the first embodiment.

Figures 5 to 9 are schematic diagrams showing assemblage of the first embodiment.

Figure 10 is a schematic diagram showing operation of the first embodiment.

Figures 11-1 to 11-4 are schematic diagrams showing actions of assemblage and disassemblage of the first embodiment.

Figure 12 is a schematic diagram showing the appearance of the second embodiment.

Figure 13 is an exploded schematic diagram showing elements of second embodiment.

Figure 14 is another exploded schematic diagram showing elements of the second embodiment.

Figure 15 is a schematic diagram showing a cross section of the second embodiment.

Figures 16 to 19A are schematic diagrams showing assemblage of the second embodiment.

Figure 19B is a schematic diagram showing another assemblage of the second embodiment.

Figure 20 is a schematic diagram showing usage of the second embodiment.

Figure 21 is a schematic diagram showing the second embodiment after insertion with a connection socket.

Figure 22 is a schematic diagram showing another type of the limiting unit of the second embodiment.

Figure 23 is a schematic diagram showing a further type of the limiting unit of the second embodiment.

Figure 24 is a schematic diagram showing another type of the clip of the second embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0019] For thorough understanding of objectives, features and effects of the invention, the invention is de-

scribed in detail as following in conjunction with attached drawings by means of embodiments.

[0020] Refer to Figures 1, 2, 3 and 4, which are a schematic diagram showing appearance of the invention, an exploded schematic diagram showing elements of the invention, another exploded schematic diagram showing elements of the invention, and a schematic diagram showing a cross section of the invention, respectively. As shown in the figures, the first embodiment is a circular rapid-joint connector comprised at least of a sliding bush 1, an elastic element 2, a holding unit 3 and a connector plug 4.

[0021] The inner edge of the sliding bush 1 is provided with a containing area 11, and an end of the sliding bush 1 has multiple buckle holes 12 while the inner edge of another end of the sliding bush 1 has a stop portion 13.

[0022] The elastic element 2 is disposed in the containing area 11 of the inner edge of the sliding bush 1.

[0023] The holding unit 3 is joined with the sliding bush 1 movably. Moreover, the holding unit 3 comprises a sleeve 31, a collar 32 provided in the sleeve 31, and a locking bush 33 joined with the sleeve 31, wherein the outer edge of the sleeve 31 has buckles 311 docked with respective buckle holes 12. Furthermore, the buckle holes 12 of the sliding bush 1 are larger than the buckles 311 of the sleeve 31, and an end of the sleeve 31 has multiple adjacent elastic pieces 312, the inner surface of each of the elastic pieces 312 is provided with a respective sticking point 313, while the periphery of the collar 32 is provided with a slot 321 docked with each sticking point 314, and the inner edge of the sleeve 31 is provided with a first internal thread portion 314. In addition, a first external thread portion 315 is provided on the outer edge of the sleeve 31 where each of the elastic pieces 312 is adjacent thereto, while the inner edge of the locking bush 33 is provided with a second internal thread portion 331 joined with the first external thread portion 315.

[0024] The connector plug 4 is penetrated into the sliding bush 1 and joined with the holding unit 3, while an end of the connector plug 4 has a top portion 41, another end has a second external thread portion 42 joined with the first internal thread portion 314, and the connector plug 4 is provided with multiple insertion terminals 43 therein. Moreover, one side of the top portion 41 is provided with an annular plate 44 abutting against the stop portion 13, and the top portion 41 is provided with a ditch 45 thereon. In addition, the top portion 41 is provided with a marking portion 46 thereon, and the connector plug 4 is provided with a guiding portion 47 therein.

[0025] Refer to Figures 5, 6, 7, 8 and 9, which are schematic diagrams showing assemblage of the first embodiment. As shown in the figures, in assembling for the invention, the elastic element 2 may be disposed in the containing area 11 of the inner edge of the sliding bush 1, followed by disposing the collar 32 between an end of the sleeve 31 and each elastic piece 312 for the collar 32 to be docked with the sticking points 313 of the inner surface of each elastic piece 312 by the slot 321 mutually,

and docked with the respective buckle holes 12 of the sliding bush 1 by the buckles 311. The buckle holes 12 of the sliding bush 1 are larger than the buckles 311 of the sleeve 31, so that the sliding bush 1 may slide on the sleeve 31. After that, a wire 5 is used to penetrate through the locking bush 33, the sliding bush 1 and the sleeve 31, the wire 5 is connected with each insertion terminal 43 of the connector plug 4, the second external thread portion 42 of the connector plug 4 is joined with the first internal thread portion 314 of the sleeve 31, and at last, the locking bush 33 is joined with the first external thread portion 315 of the sleeve 31 by the second internal thread portion 331 thereof. As such, the assemblage is accomplished.

[0026] Refer to Figure 10 and Figures 11-1 to 11-4, which are a schematic diagram showing operation of the invention and schematic diagrams showing actions of assemblage and disassemblage of the invention. As shown in the figures, the invention may be inserted to a corresponding connection socket 6 in use, while a user may correspond to the socket body 61 of the connection socket 6 by the connector plug 4 in docking, and correspond to the marking portion 63 of the connection socket 6 by the marking portion 46 of the connector plug 4, thereby the guiding portion 47 of the connector plug 4 corresponds to groove 62 of the connection socket 6 in order to identify insertion direction, such that incorrect insertion is avoided. As the top portion 41 of the connector plug 4 is docked to the socket body 61, the periphery of the top portion 41 will withstand each buckle 64 of the connection socket 6 for each buckle 64 to be opened. In the mean time, an end of each buckle 64 will abut against the end edge of the sliding bush 1, such that the sliding bush 1 is pushed toward the holding unit 3 (rearwards) and compresses the elastic element 2, and be removed from the end edge of the sliding bush 1 after each buckle 64 enters the ditch 45 of the top portion 41, while the sliding bush 1 is pushed back toward the top portion 41 (forwards) automatically due to restitution force, such that the sliding bush 1 is locked on the outer edge of each buckle 64 of the connection socket 6 to limit each buckle 64 for each insertion terminal 43 to be inserted into the socket body 61, and thereby, to accomplish insertion operation.

[0027] In disassembling, the sliding bush 1 is pulled toward the holding unit 3 (rearwards), such that the sliding bush 1 is no longer locked to the outer edge of each buckle 64. After that, a force may be applied to remove the connector plug 4 from the connector plug 6 directly by the user.

[0028] In summary, with the description above, the invention can achieve actually the expected objectives of the invention, such that in assembling, direct docking with the connection socket by the connector plug is available for the connection socket to push away the sliding bush. After the connection socket and the connector plug are snap-fitting, the sliding bush is pushed back by the elastic element automatically, such that the sliding bush is locked to outer edge of the connection socket to complete

operation of assemblage. In disassembling, the sliding bush is pulled backwards such that the sliding bush is not limited to the outer edge of the connection socket any more. After that, a force may be applied to remove the connector plug from the connection socket directly.

[0029] Refer to Figures 12, 13, 14 and 15, which are a schematic diagram showing appearance of the invention, an exploded schematic diagram showing elements of the invention, another exploded schematic diagram showing elements of the invention, and a schematic diagram showing a cross section of the invention, respectively. As shown in the figures, the second embodiment is a circular rapid-joint connector comprised at least of a sliding bush 1a, an elastic element 2, a holding unit 3a and a connector plug 4.

[0030] The sliding bush 1a has multiple extension sections 10a provided on an end thereof; the extension sections 10a have a respective recession area 101a formed therebetween; and the inner edge of the sliding bush 1a is provided with a containing area 11a, and an end of the sliding bush 1a has multiple buckle holes 12a, while the inner edge of another end of the sliding bush 1a has a stop portion 13a.

[0031] The elastic element 2 is provided in the containing area 11a of the inner edge of the sliding bush 1a.

[0032] The holding unit 3a is joined with the sliding bush 1a movably, the outer edge thereof having a limiting unit 30a capable of limiting each of the extension sections. The holding unit 3a comprises a sleeve 31a, a collar 32a provided in the sleeve 31a, a clip 34a provided outside of the collar 32a, and a locking bush 33a joined with the sleeve 31a and constricting the locking bush 33a of the clip 34a. The limiting unit 30a is provided on the outer edge of the sleeve 31a. The limiting unit 30a comprises bumps 301a mating with respective recession areas 101a. The bumps 301a are formed with a respective limiting slot 302a therebetween for each of the extension sections 10a to mate with. Wherein the outer edge of the sleeve 31a has buckles 311a docked with respective buckle holes 12a, and the buckle holes 12a of the sliding bush 1a are larger than the buckles 311a of the sleeve 31a. An end of the sleeve 31a has multiple adjacent elastic pieces 312a. The inner surface of each of the elastic pieces 312a is provided with a stop ring 316a. The inner edge of the sleeve 31a is provided with a first internal thread portion 314a. Furthermore, the outer edge of the sleeve 31a adjacent to each of the elastic pieces 312a is provided with a first external thread portion 315a. An end of the clip 34a has multiple adjacent clamping sheets 341a. An edge of the clip 34a is provided with a notch portion 342a. Moreover, the inner edge of the locking bush 33a is provided with a second internal thread portion 331a joined with the first external thread portion 315a.

[0033] The connector plug 4 is penetrated into the sliding bush 1a and joined with the holding unit 3a, while an end of the connector plug 4 has a top portion 41, another end has a second external thread portion 42 joined with the first internal thread portion 314a, and the connector

plug 4 is provided with multiple insertion terminals 43 therein. Moreover, one side of the top portion 41 is provided with an annular plate 44 abutting against the stop portion 13a, and the top portion 41 is provided with a ditch 45 thereon. In addition, the top portion 41 is provided with a marking portion 46 thereon, and the connector plug 4 is provided with a guiding portion 47 therein.

[0034] Refer to Figures 16, 17, 18, 19A and 19B, which are schematic diagrams showing assemblage of the invention and a schematic diagram showing another assemblage of the invention. As shown in the figures, in assemblage for the second embodiment, the elastic element 2 may be disposed in the containing area 11a on the inner edge of the sliding bush 1a, and the buckle holes 12a of the sliding bush 1a are docked with the respective buckles 311a of the sleeve 31a, such that the extension sections 10a and the recession areas 101a of the sliding bush 1a are mated with the respective limiting slots 302a and the bumps 301a mutually. Moreover, the buckle holes 12a of the sliding bush 1a are larger than the buckles 311a of the sleeve 31a, so that the sliding bush 1a is movable on the sleeve 31a. Moreover, the sliding bush 1a can only move forwards or rearwards, but it cannot move leftwards, rightwards by fitting each of the extension sections 10a, the recession areas 101a, the limiting slot 302a and the bumps 301a. After that, a wire 5 is used to penetrate through the locking bush 33a, the clip 34a, the collar 32a, the sliding bush 1a and the sleeve 31a for the wire 5 to be connected with each of the insertion terminals 43 of the connector plug 4. Then, the second external thread portion 42 of the connector plug 4 is joined with the first internal thread portion 314a of the sleeve 31a, followed by providing the collar 32a between the elastic pieces 312a on an end of the sleeve 31a for the edge of the collar 32a to be locked by the stop ring 316a. Subsequently, the clip 34a is harnessed around the outer edge of the collar 32a. Finally, the locking bush 33a is joined with the first external thread portion 315a of the sleeve 31a by the second internal thread portion 331a thereof for the inner edge of the locking bush 33a to constrict the outer edge of the clip 34a. In turn, the clip 34a takes advantage of fitting between the clamping sheets 341a and the notch portion 342a to form a stable clamping force toward jacket of the wire 5 in order to prevent the wire 5 from escape. Moreover, the clamping characteristic function of the clip 34a may be utilized in practical use, such that it is applicable to wires 5, 5a of different diameters. As it is applicable to the wire 5 of a wire diameter having larger diameter, the locking bush 33a is locked more deeply in conjunction with the clip 34a (as shown in Figure 19A). As it is applicable to the wire 5a of a wire diameter having smaller diameter, the locking bush 33a is locked shallower in conjunction with the clip 34a (as shown in Figure 19B). As such, the assemblage is accomplished.

[0035] Refer to Figures 20 and 21, which are a schematic diagram showing operation of the invention, and a schematic diagram showing the invention after insertion

with a connection socket. As shown in the figures, the second embodiment may be inserted into a corresponding connection socket 6 in use, while correspond to the socket body 61 of the connection seat 6 by the connector plug 4 in docking, and correspond to the marking portion 63 of the connection socket 6 by the marking portion 46 of the connector plug 4, thereby the guiding portion 47 of the connector plug 4 corresponds to groove 62 of the connection socket 6 in order to identify insertion direction, such that incorrect insertion is avoided. As the top portion 41 of the connector plug 4 is docked to socket body 61, the periphery of the top portion 41 will withstand each buckle 64 of the connection socket 6 for each buckle 64 to be opened. In the mean time, an end of each buckle 64 will abut against the end edge of the sliding bush 1a, such that the sliding bush 1a is pushed toward the holding unit 3a (rearwards) and compresses the elastic element 2, and be removed from the end edge of the sliding bush 1a after each buckle 64 enters the ditch 45 of the top portion 41, while the sliding bush 1a is pushed back toward the top portion 41 (forwards) automatically due to restitution force, such that the sliding bush 1a is locked on the outer edge of each buckle 64 of the connection socket 6 to limit each buckle 64 for each insertion terminal 43 to be inserted into the socket body 61, and thereby, to accomplish insertion operation.

[0036] In disassembling, the sliding bush 1a is pulled toward the holding unit 3a (rearwards), such that the sliding bush 1a no longer locked to the outer edge of each buckle 64. After that, a force may be applied to disassemble the connector plug 4 from the connection socket 6 directly by the user.

[0037] Moreover, as the sliding bush 1a moves forwards or rearwards, the sliding bush 1a is mated with the limiting slots 302a and bumps 301a by the respective extension sections 10a and recession areas 101a, such that the sliding bush 1a is capable of moving forwards or rearwards only, but it is incapable of rotating leftwards or rightwards during movement on the sleeve 31a to maintain its position of the sliding bush 1a accordingly for operation of use thereof to be more stable.

[0038] Refer to Figure 22, which is a schematic diagram showing another type of a limiting unit of the invention. As shown in the figure, in addition to the structure described above, the limiting unit 30a of the second embodiment may be also of the structural type in this example, which differs in that the limiting unit 30b comprises a rib ring 303b provided on the sleeve 31a, on which multiple inserting slots 304b docked with the respective extension sections 10a are provided. Thereby, the extension sections 10a may be inserted into the respective inserting slots 304b while the sliding bush 1a moves forwards, rearwards. Therefore, the sliding bush 1a is capable of moving forwards, rearwards only, but it is incapable of rotating leftwards, rightwards during movement on the sleeve 31a to maintain the position of the sliding bush 1a accordingly for operation of use thereof to be more stable.

[0039] Refer to Figure 23, which is a schematic diagram showing a further type of a limiting unit of the invention. As shown in the figure, in addition to the structure described above, the limiting units 30a, 30b may also be of the structural type in this example, which differs in that the limiting unit 30c comprises multiple prolonged plates 305c mated with the respective recession areas 101a, and the prolonged plates 305c are formed with a respective groove 306c therebetween for each of the extension sections 10a to mate with. Thereby, the extension sections 10a and the recession areas 101a may be mated with the respective prolonged plates 305c and grooves 306c mutually when the sliding bush 1a moves forwards or rearwards, such that the sliding bush 1a is capable of moving forwards or rearwards only, but it is incapable of rotating leftwards or rightwards during movement on the sleeve 31a to maintain its position of the sliding bush 1a accordingly for operation of use thereof to be more stable.

[0040] Refer to Figure 24, which is a schematic diagram showing another type of a clip of the invention. As shown in the figure, in addition to the structure described above, the clip 34a of the second embodiment may be of the structural type in this example, which differs in that an end of the clip 34b has multiple adjacent clamping sheets 341b, and the structure of the notch portion 342a is omitted in this example. However, the inner edge of the locking bush 33a may also be used to constrict the outer edge of the clip 34b during operation, such that the clip 34b takes advantage of each of the clamping sheet 341b to form a stable clamping ability on the jacket of the wire 5, such that the applicability to wires of different diameters may also be achieved.

[0041] In summary, with the description above, the invention can achieve actually the expected objectives of the invention, such that in assembling, direct docking with the connection socket by the connector plug is available for the connection socket to push away the sliding bush. After the connection socket and the connector plug are snap-fitting, the sliding bush is pushed back by the elastic element automatically, such that the sliding bush is locked to the outer edge of the connection socket to complete operation of assemblage. In disassembling, the sliding bush is pulled backwards such that the sliding bush is not locked to the outer edge of the connection socket any more. After that, a force may be applied to disassemble the connector plug from the connection socket directly, and the fitting of the extension sections, the recession areas and the limiting unit is utilized to limit and prevent the sliding bush from rotation. As a result, the effects of rapid assembling, solid joining, rapid disassembling, simple structure and ease of use are achieved.

Reference numerals

[0042]

1,1a sliding bush

10a	extension section	
101a	recession area	
11,11a	containing area	
12,12a	buckle holes	
13,13a	stop portion	5
2	elastic element	
3,3a	holding unit	
30a,30b,30c	limiting unit	
301a	bump	
302a	limiting slot	10
303b	rib ring	
304b	insertion slot	
305c	prolonged plate	
306c	groove	
31,31a	sleeve	15
311,311a	buckles	
312,312a	elastic piece	
313	sticking points	
314,314a	first internal thread portion	
315,315a	first external thread portion	20
316a	stop ring	
32,32a	collar	
321	slot	
33,33a	locking bush	
34a,34b	clip	25
341b	clamping sheet	
342a	notch portion	
331,331a	second internal thread portion	
4	connector plug	
41	top portion	30
42	second external thread portion	
43	insertion terminals	
44	annular plate	
45	ditch	
46	marking portion	35
47	guiding portion	
5	wire	
6	connection socket	
61	socket body	
62	groove	40
63	marking portion	
64	buckles	

Claims

1. A circular rapid-joint connector, including:

a sliding bush (1, 1a);
 an elastic element (2) provided on the inner edge
 of the sliding bush (1, 1a);
 a holding unit (3, 3a) joined with the sliding bush
 (1, 1a) movably; and
 a connector plug (4) penetrating into the sliding
 bush (1, 1a) and joined with the holding unit (3,
 3a);
 wherein an end of the connector plug (4) forms
 a top portion (41), and wherein

the connector plug (4) is provided with multiple
 insertion terminals (43) therein, while one side
 of the top portion (41) is provided with an annular
 plate (44), wherein the top portion (41) is further
 provided with a ditch (45) thereon annularly,
characterized in that the other end of the con-
 nector plug (4) forming a second external thread
 portion (42);

a containing area (11, 11a) capable of accom-
 modating the elastic element (2) is provided on
 the inner edge of the sliding bush (1, 1a), where-
 in an end of the sliding bush (1, 1a) has multiple
 buckle holes (12, 12a) engaged with the holding
 unit (3, 3a), and wherein the inner edge of an-
 other end of the sliding bush (1, 1a) has a stop
 portion (13, 13a) abutting against the annular
 plate (44) of the connector plug (4);

the holding unit (3, 3a) comprises a sleeve (31,
 31a), a collar (32, 32a) provided in the sleeve
 (31, 31a), and a locking bush (33, 33a) joined
 with the sleeve (31, 31a), wherein the outer edge
 of the sleeve (31, 31a) has multiple buckles
 (311, 311a) docking with the buckle holes (12,
 12a) of the sliding bush (1, 1a) respectively, and
 an end of the sleeve (31, 31a) has multiple ad-
 jacent elastic pieces (312, 312a), the inner sur-
 face of each of the elastic pieces (312) being
 provided with a respective sticking point (313),
 while the periphery of the collar (32) is provided
 with a slot (321) docking with each of the sticking
 points (313), and the inner edge of the sleeve
 (31, 31a) is provided with a first internal thread
 portion (314, 314a) joined with the second ex-
 ternal thread portion (42) of the connector plug
 (4), and wherein a first external thread portion
 (315, 315a) is provided on the outer edge of the
 sleeve (31, 31a) where each of the elastic pieces
 (312, 312a) is adjacent thereto, while the inner
 edge of the locking bush (33, 33a) is provided
 with a second internal thread portion (331, 331a)
 joined with the first external thread portion (315,
 315a), and the buckle holes (12, 12a) of the slid-
 ing bush (1, 1a) are larger than the buckles (311,
 311a) of the sleeve (31, 31a), and wherein the
 top portion (41) is further provided with a mark-
 ing portion (46) thereon, and the connector plug
 (4) is provided with a guiding portion (47) therein.

2. The circular rapid-joint connector according to claim
 1, wherein

the sliding bush (1a) comprises multiple extension
 sections (10a) provided on an end thereof, and the
 extension sections (10a) are formed with a respec-
 tive recession area (101a) therebetween; the outer
 edge of the holding unit (3a) that is joined with the
 sliding bush (1a) movably has a limiting unit (30a)
 capable of limiting each of the extension sections
 (10a) through engaging the recession areas (101a).

3. The circular rapid-joint connector according to claim 2, wherein the holding unit (3a) further comprises a clip (34a) provided outside of the collar (32a), and the locking bush (33a) joining with the sleeve (31a) constricting the clip (34a), while the limiting unit (30a) is provided on the outer edge of the sleeve (31a), the inner surface of each of the elastic pieces (312a) being provided with a stop ring (316a). 5
4. The circular rapid-joint connector according to claim 3, wherein the limiting unit (30a) comprises multiple bumps (301a), each of which mates with the respective recession area (101a), and the bumps (301a) are formed with a respective limiting slot (302a) therebetween for each of the extension sections (10a) to mate with. 10 15
5. The circular rapid-joint connector according to claim 3, wherein the limiting unit (30b) comprises a rib ring (303b) provided on the sleeve (31a), and multiple insertion slots (304b) which are docked with the respective extension sections (10a) are provided thereon. 20
6. The circular rapid-joint connector according to claim 3, wherein the limiting unit (30c) comprises multiple prolonged plates (305c), each of which mates with the respective recession area (101a), and the prolonged plates (305c) are formed with a respective groove (306c) therebetween for each of the extension sections (10a) to mate with. 25 30
7. The circular rapid-joint connector according to claim 3, wherein an end of the clip (34b) has multiple adjacent clamping sheets (341b), and the edge of the clip (34a) has a notch portion (342a). 35

Patentansprüche

1. Kreisförmiger Schnellkopplungsverbinder, umfassend: 40
 - eine Gleitbuchse (1, 1a),
 - ein elastisches Element (2), das an dem inneren Rand der Gleitbuchse (1, 1a) bereitgestellt ist,
 - eine Halteeinheit (3, 3a), die mit der Gleitbuchse (1, 1a) beweglich verbunden ist, und
 - einen Anschlussstecker (4), der in die Gleitbuchse (1, 1a) dringt und mit der Halteeinheit (3, 3a) verbunden ist, 45
 - wobei ein Ende des Anschlusssteckers (4) einen oberen Abschnitt (41) ausbildet und wobei
 - der Anschlussstecker (4) mit mehreren Einsteckanschlüssen (43) darin ausgestattet ist, wobei eine Seite des oberen Abschnitts (41) mit einer ringförmigen Platte (44) ausgestattet ist, 50 55

wobei der obere Abschnitt (41) ferner ringförmig mit einem Graben (45) daran ausgestattet ist, **dadurch gekennzeichnet, dass** das andere Ende des Anschlusssteckers (4) einen zweiten äußeren Gewindeabschnitt (42) ausbildet, wobei ein Aufnahmebereich (11, 11a), der in der Lage ist, das elastische Element (2) aufzunehmen, an dem inneren Rand der Gleitbuchse (1, 1a) bereitgestellt ist, wobei ein Ende der Gleitbuchse (1, 1a) mehrere Rastlöcher (12, 12a) umfasst, die mit der Halteeinheit (3, 3a) in Eingriff stehen und wobei der innere Rand eines anderen Endes der Gleitbuchse (1, 1a) einen Stoppabschnitt (13, 13a) umfasst, der gegen die ringförmige Platte (44) des Anschlusssteckers (4) anliegt, wobei die Halteeinheit (3, 3a) eine Hülse (31, 31a), einen Kragen (32, 32a), der an der Hülse (31, 31a) bereitgestellt ist, und eine Rastbuchse (33, 33a) umfasst, die mit der Hülse (31, 31a) verbunden ist, wobei der äußere Rand der Hülse (31, 31a) mehrere Wölbungen (311, 311a) aufweist, die jeweils mit den Rastlöchern (12, 12a) der Gleitbuchse (1, 1a) koppeln und ein Ende der Hülse (31, 31a) weist mehrere benachbarte elastische Elemente (312, 312a) auf, wobei die Innenfläche von jedem der elastischen Elemente (312) mit einem entsprechenden Haftpunkt (313) ausgestattet ist, wobei die Peripherie des Kragens (32) mit einem Schlitz (321) ausgestattet ist, der mit jedem der Haftpunkte (313) koppelt und wobei der innere Rand der Hülse (31, 31a) mit einem ersten inneren Gewindeabschnitt (314, 314a) ausgestattet ist, der mit dem zweiten äußeren Gewindeabschnitt (42) des Anschlusssteckers (4) verbunden ist und wobei ein erster äußerer Gewindeabschnitt (315, 315a) an dem äußeren Rand der Hülse (31, 31a) bereitgestellt ist, wobei jedes der elastischen Elemente (312, 312a) benachbart hierzu ist, während der innere Rand der Rastbuchse (33, 33a) mit einem zweiten inneren Gewindeabschnitt (331, 331a) ausgestattet ist, der mit dem ersten äußeren Gewindeabschnitt (315, 315a) verbunden ist, und wobei die Rastlöcher (12, 12a) der Gleitbuchse (1, 1a) größer als die Wölbungen (311, 311a) der Hülse (31, 31a) sind und wobei der obere Abschnitt (41) ferner mit einem Markierungsabschnitt (46) daran ausgestattet ist und der Anschlussstecker (4) darin mit einem Führungsabschnitt (47) ausgestattet ist.

2. Kreisförmiger Schnellkopplungsverbinder gemäß Anspruch 1, bei welchem die Gleitbuchse (1a) mehrere Verlängerungsabschnitte (10a) umfasst, die an einem Ende davon bereitgestellt sind, und die Verlängerungsabschnitte (10a) mit einem entsprechenden Aussparungsbereich (101a) dazwischen ausge-

bildet sind, wobei der äußere Rand der Halteeinheit (3a), der beweglich mit der Gleitbuchse (1a) verbunden ist, eine Begrenzungseinheit (30a) aufweist, die in der Lage ist, jeden der Verlängerungsabschnitte (10a) durch Eingriff in die Aussparungsbereiche (101a) zu begrenzen.

3. Kreisförmiger Schnellkopplungsverbinder gemäß Anspruch 2, bei welchem die Halteeinheit (3a) ferner einen Clip (34a) umfasst, der außerhalb des Kragens (32a) bereitgestellt ist, und die Rastbuchse (33a) mit der Hülse (31a) verbunden ist, wodurch der Clip (34a) verengt wird, wobei die Begrenzungseinheit (30a) an dem äußeren Rand der Hülse (31a) bereitgestellt ist und die Innenfläche von jedem der elastischen Elemente (312a) mit einem Anschlagring (316a) ausgestattet ist.
4. Kreisförmiger Schnellkopplungsverbinder gemäß Anspruch 3, bei welchem die Begrenzungseinheit (30a) mehrere Auswölbungen (301a) umfasst, von denen jede zu dem entsprechenden Aussparungsbereich (101a) passt und die Auswölbungen (301a) mit einem entsprechenden Begrenzungsschlitz (302a) dazwischen passend zu jedem der Verlängerungsabschnitte (10a) ausgebildet sind.
5. Kreisförmiger Schnellkopplungsverbinder gemäß Anspruch 3, bei welchem die Begrenzungseinheit (30b) einen Rippenring (303b) umfasst, der an der Hülse (31a) bereitgestellt ist, und mehrere Einführschlitze (304b), die mit den entsprechenden Verlängerungsabschnitten (10a) gekoppelt sind, darauf bereitgestellt sind.
6. Kreisförmiger Schnellkopplungsverbinder gemäß Anspruch 3, bei welchem die Begrenzungseinheit (30c) mehrere verlängerte Platten (305c) umfasst, von denen jede zu dem entsprechenden Aussparungsbereich (101a) passt und die verlängerten Platten (305c) mit einer entsprechenden Nut (306c) dazwischen passend zu jedem der Verlängerungsabschnitte (10a) ausgebildet sind.
7. Kreisförmiger Schnellkopplungsverbinder gemäß Anspruch 3, bei welchem ein Ende des Clips (34b) mehrere benachbarte Klemmlagen (341b) umfasst und der Rand des Clips (34a) einen Einkerbungsabschnitt (342a) aufweist.

Revendications

1. Connecteur rapide circulaire, incluant:

une bague coulissante (1, 1a);
un élément élastique (2) fourni sur le côté intérieur de la bague coulissante (1, 1a);

une unité de maintien (3, 3a) jointe à la bague coulissante (1, 1a) de manière mobile; et
une prise de connecteur (4) pénétrant dans la bague coulissante (1, 1a) et jointe à l'unité de maintien (3, 3a);

dans lequel une extrémité de la prise de connecteur (4) forme une partie supérieure (41), et dans lequel

la prise de connecteur (4) est pourvue de multiples bornes d'insertion (43) dans celle-ci, tandis qu'un côté de la partie supérieure (41) est pourvu d'une plaque annulaire (44), dans lequel la partie supérieure (41) est en outre pourvue d'une tranchée (45) sur celle-ci de manière annulaire, **caractérisé en ce que** l'autre extrémité de la prise de connecteur (4) formant une seconde partie filetée externe (42);

une zone de contenance (11, 11a) capable de loger l'élément élastique (2) est pourvue sur le bord intérieur de la bague coulissante (1, 1a), dans lequel une extrémité de la bague coulissante (1, 1a) présente de multiples trous d'attache (12, 12a) en prise avec l'unité de maintien (3, 3a), et dans lequel le bord intérieur d'une autre extrémité de la bague coulissante (1, 1a) présente une partie d'arrêt (13, 13a) en butée contre la plaque annulaire (44) de la prise de connecteur (4);

l'unité de maintien (3, 3a) comprend un manchon (31, 31a), une bague d'arrêt (32, 32a) pourvue dans le manchon (31, 31a), et une bague de verrouillage (33, 33a) jointe au manchon (31, 31a), dans lequel le bord extérieur du manchon (31, 31a) présente de multiples attaches (311, 311a) accrochées au trous d'attache (12, 12a) de la bague coulissante (1, 1a) respectivement, et une extrémité du manchon (31, 31a) présente de multiples pièces élastiques adjacentes (312, 312a), la surface intérieure de chacune des pièces élastiques (312) étant pourvue d'un point de blocage respectif (313), tandis que la périphérie de la bague d'arrêt (32) est pourvue d'une fente (321) accrochée à chacun des points de blocage (313), et le bord intérieur du manchon (31, 31a) est pourvu d'une première partie filetée interne (314, 314a) jointe à la seconde partie filetée externe (42) de la prise de connecteur (4), et dans lequel une première partie filetée externe (315, 315a) est pourvue sur le bord extérieur du manchon (31, 31a) où chacune des pièces élastiques (312, 312a) est adjacente à celle-ci, tandis que le bord intérieur de la bague de verrouillage (33, 33a) est pourvu d'une seconde partie filetée interne (331, 331a) jointe à la première partie filetée externe (315, 315a), et les trous d'attache (12, 12a) de la bague coulissante (1, 1a) sont plus larges que les attaches (311, 311a) du manchon (31, 31a), et dans lequel la partie supé-

rieure (41) est en outre pourvue d'une partie de marquage (46) sur celle-ci, et la prise de connecteur (4) est pourvue d'une partie de guidage (47) dans celle-ci.

5

2. Connecteur rapide circulaire selon la revendication 1, dans lequel la bague coulissante (1a) comprend de multiples sections d'extension (10a) pourvues sur une extrémité de celle-ci, et les sections d'extension (10a) sont formées avec une zone de dépression respective (101a) entre celles-ci ; le bord extérieur de l'unité de maintien (3a) qui est jointe à la bague coulissante (1a) de manière mobile présente une unité de limitation (30a) capable de limiter chacune des sections d'extension (10a) en entrant en prise avec les zones de dépression (101a). 10 15

3. Connecteur rapide circulaire selon la revendication 2, dans lequel l'unité de maintien (3a) comprend en outre une pince (34a) pourvue à l'extérieur de la bague d'arrêt (32a), et la bague de verrouillage (33a) joignant le manchon (31a) serrant la pince (34a), tandis que l'unité de limitation (30a) est pourvue sur le bord extérieur du manchon (31a), la surface intérieure de chacune des pièces élastiques (312a) étant pourvue d'un anneau d'arrêt (316a). 20 25

4. Connecteur rapide circulaire selon la revendication 3, dans lequel l'unité de limitation (30a) comprend de multiples bosses (301a), dont chacune se couple avec la zone de dépression respective (101a), et les bosses (301a) sont formées d'une fente de limitation respective (302a) entre celles-ci pour que chacune des sections d'extension (10a) se couple avec celle-ci. 30 35

5. Connecteur rapide circulaire selon la revendication 3, dans lequel l'unité de limitation (30b) comprend un anneau à nervure (303b) pourvu sur le manchon (31a), et de multiples fentes d'insertion (304b) qui sont accrochées aux sections d'extension respectives (10a) sont pourvues sur celui-ci. 40

6. Connecteur rapide circulaire selon la revendication 3, dans lequel l'unité de limitation (30c) comprend de multiples plaques prolongées (305c), dont chacune se couple avec la zone de dépression respective (101a), et les plaques prolongées (305c) sont formées d'une rainure respective (306c) entre celles-ci pour que chacune des sections d'extension (10a) se couple avec celle-ci. 45 50

7. Connecteur rapide circulaire selon la revendication 3, dans lequel une extrémité de la pince (34b) présente de multiples feuilles de serrage adjacentes (341b), et le bord de la pince (34a) présente une partie d'encoche (342a). 55

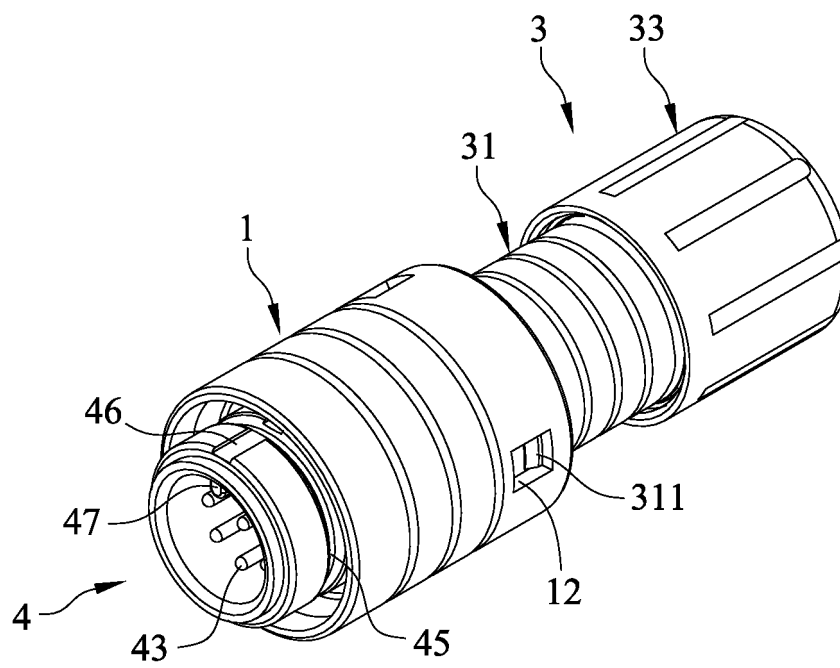


FIG. 1

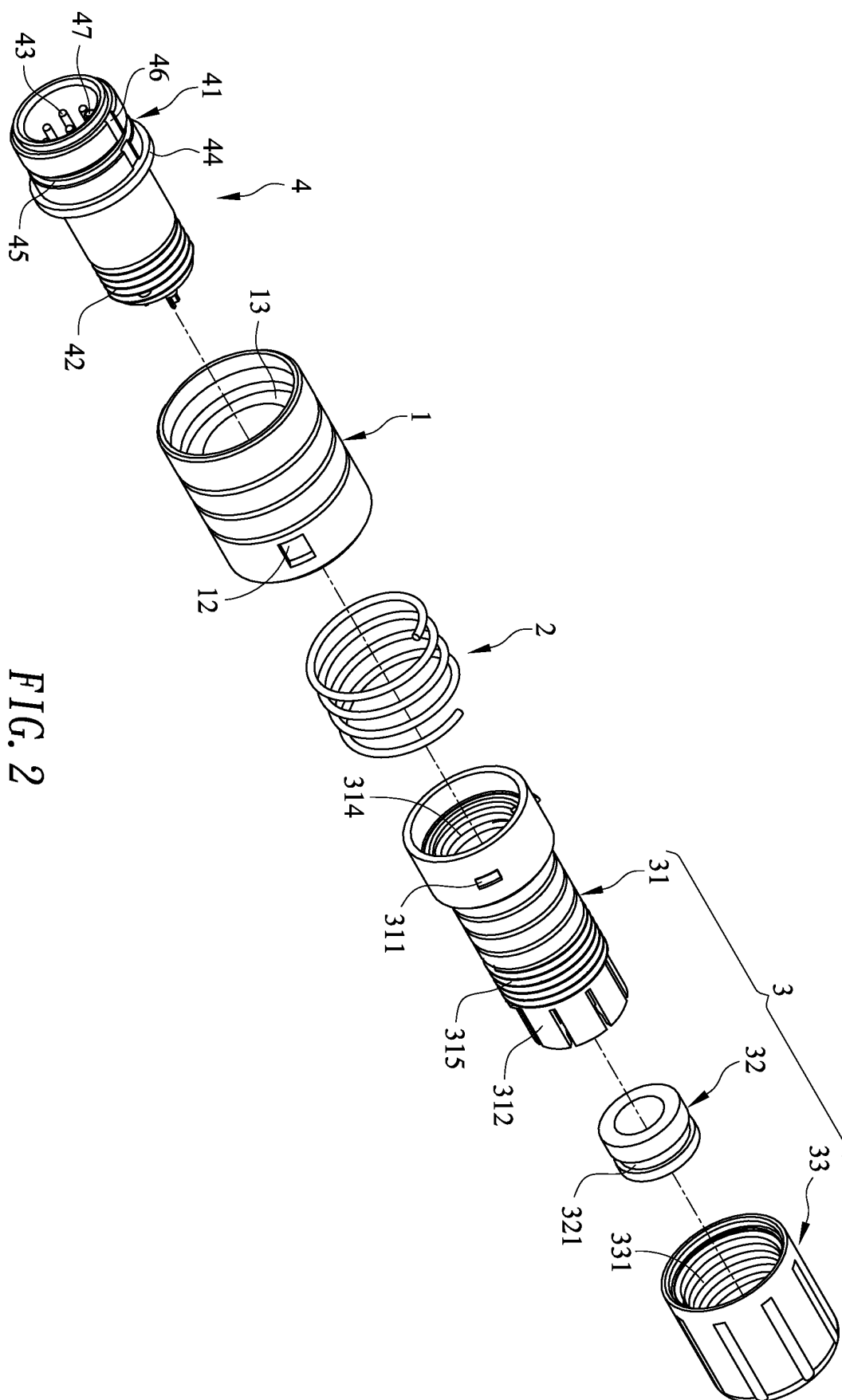


FIG. 2

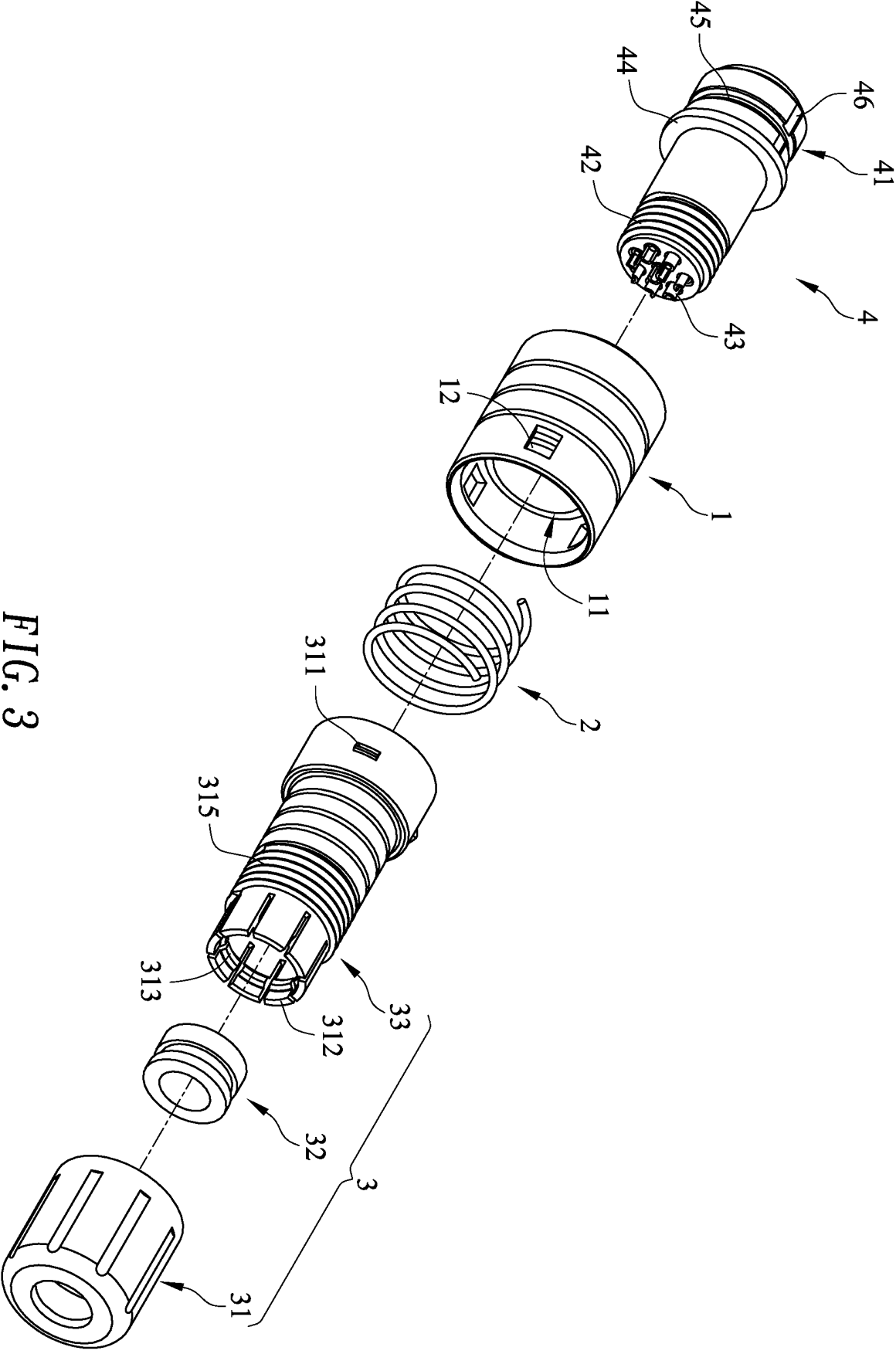


FIG. 3

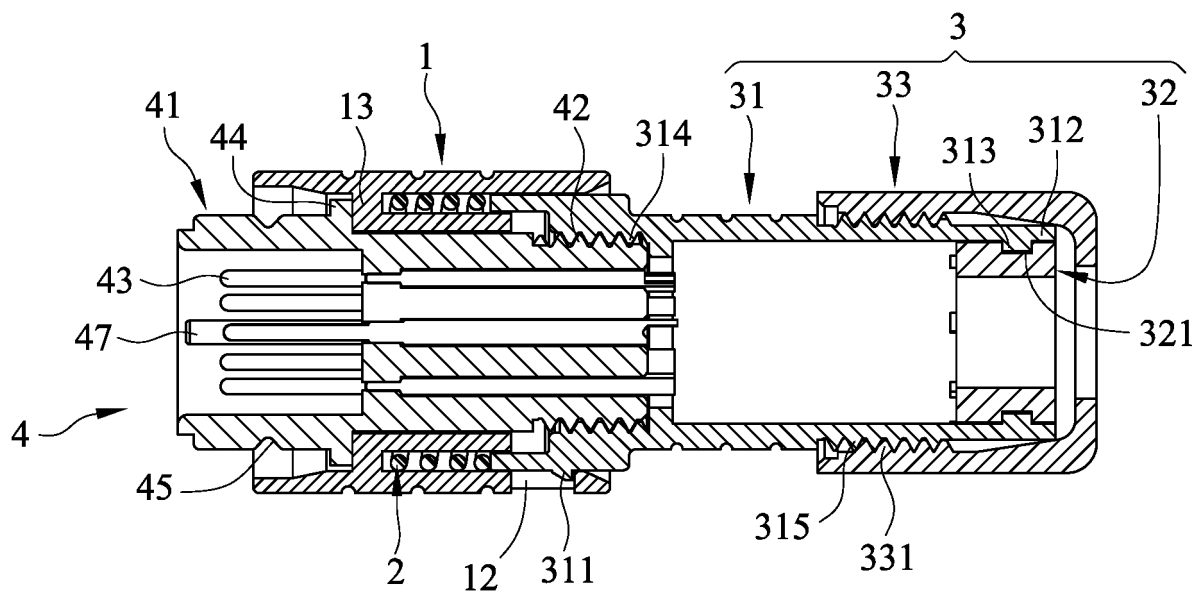


FIG. 4

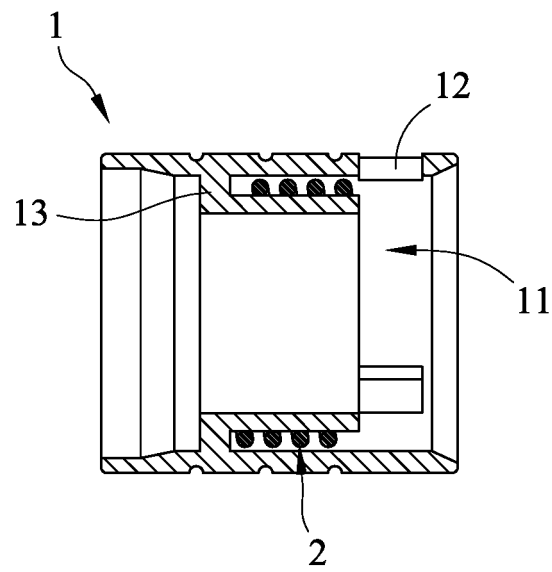


FIG. 5

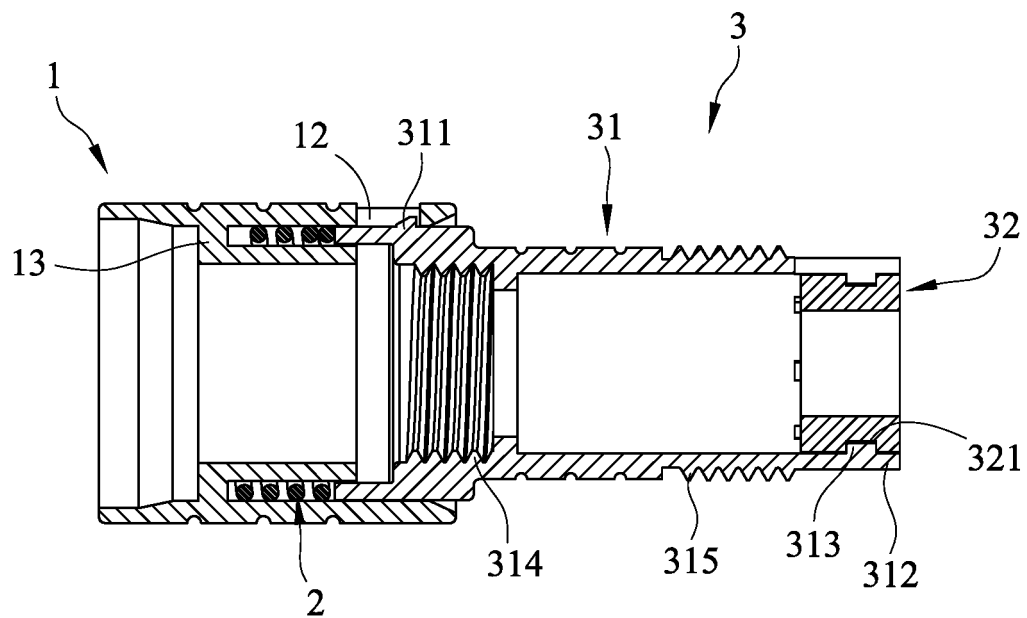


FIG. 6

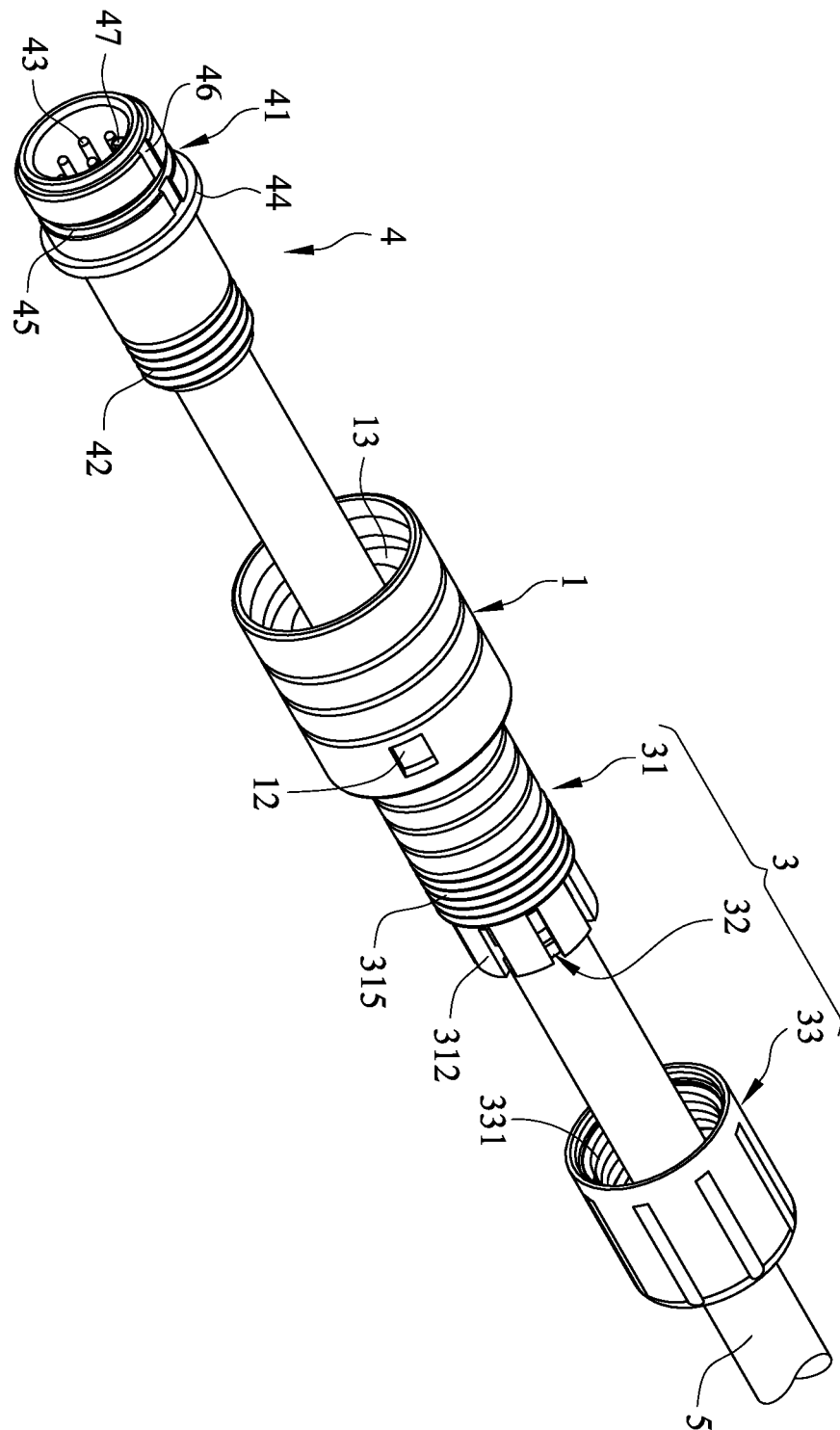


FIG. 7

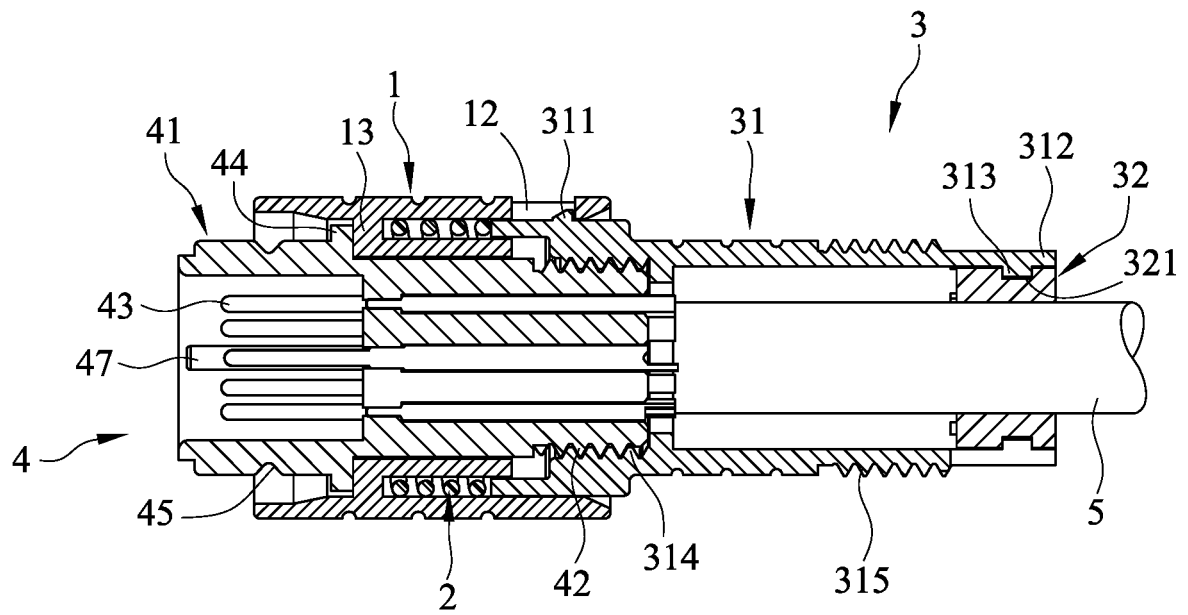


FIG. 8

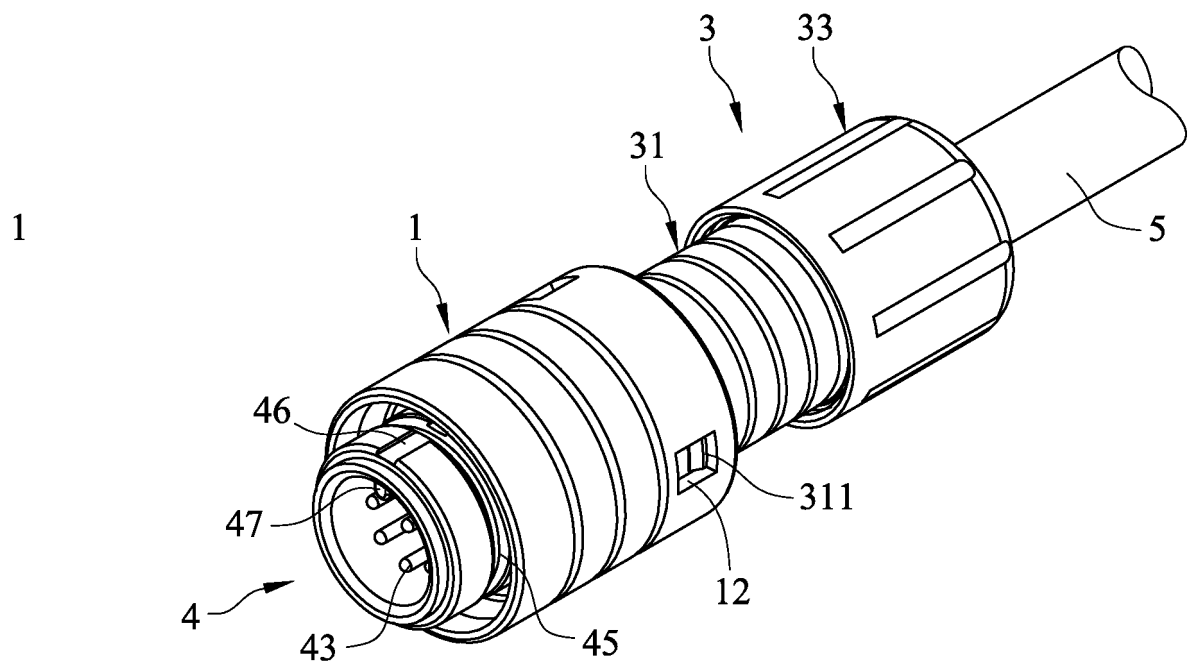


FIG. 9

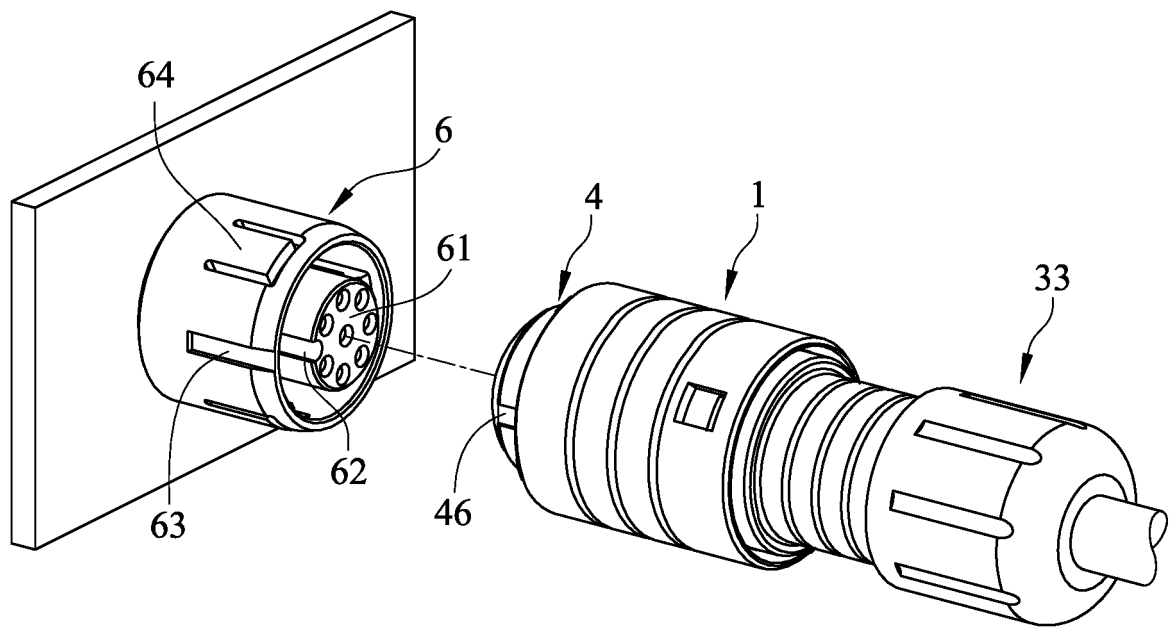


FIG. 10

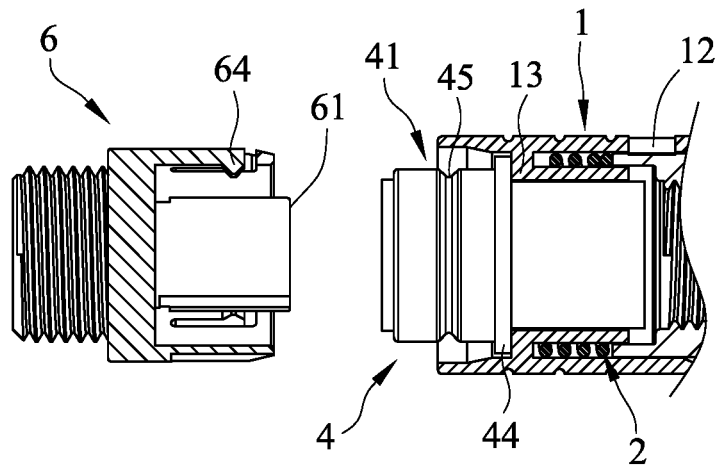


FIG. 11-1

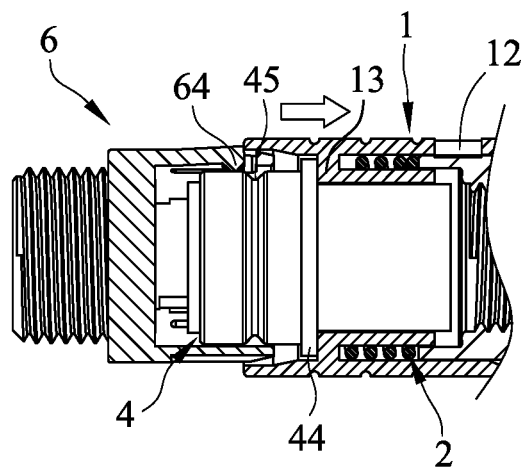


FIG. 11-2

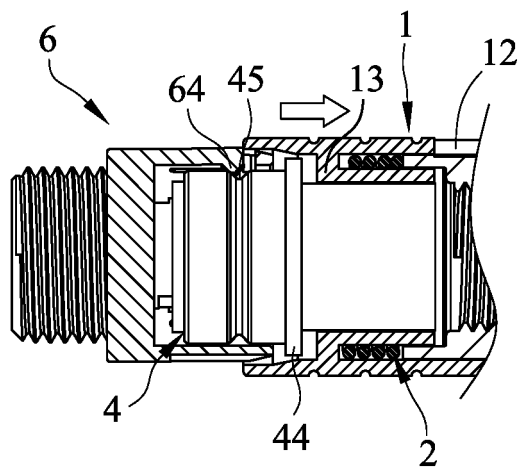


FIG. 11-3

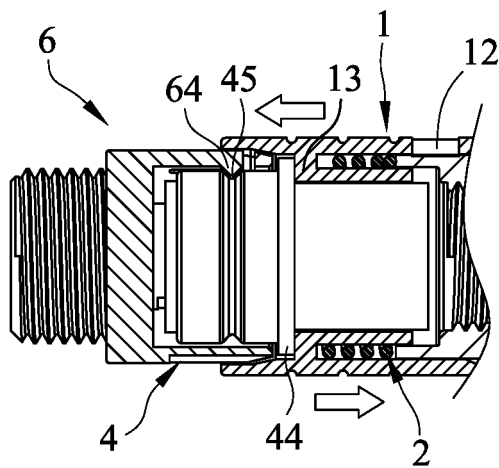


FIG. 11-4

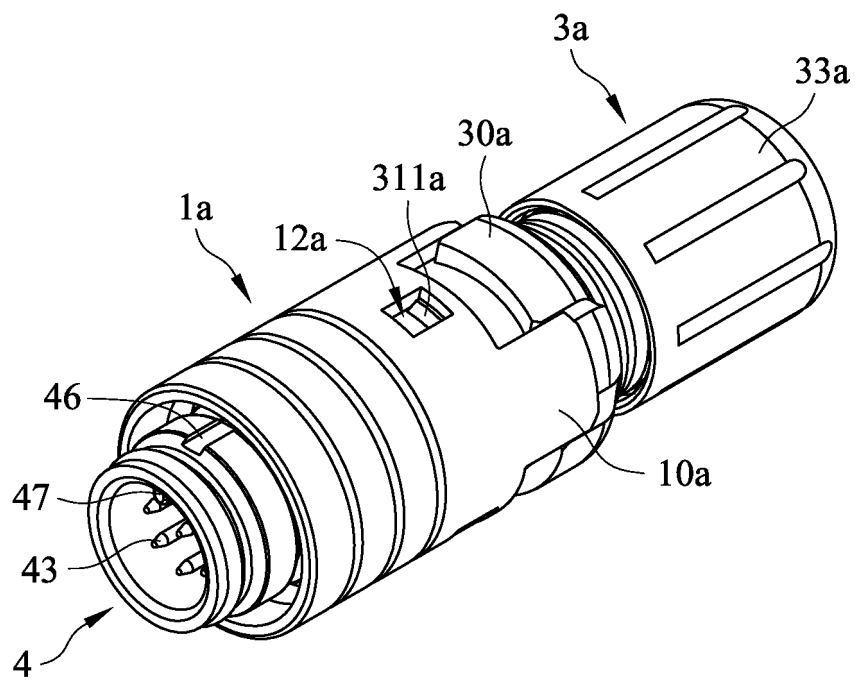
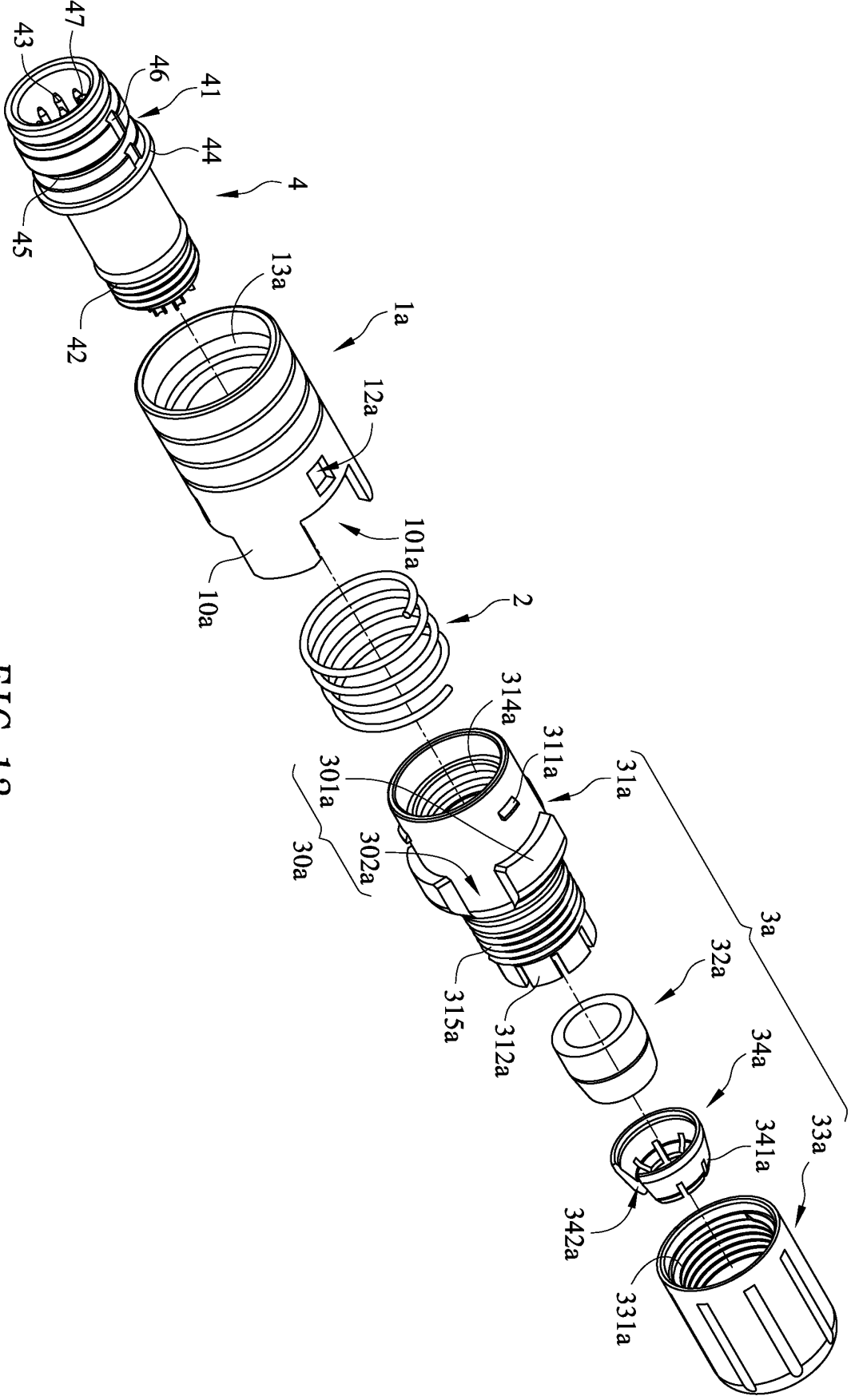


FIG. 12

FIG. 13



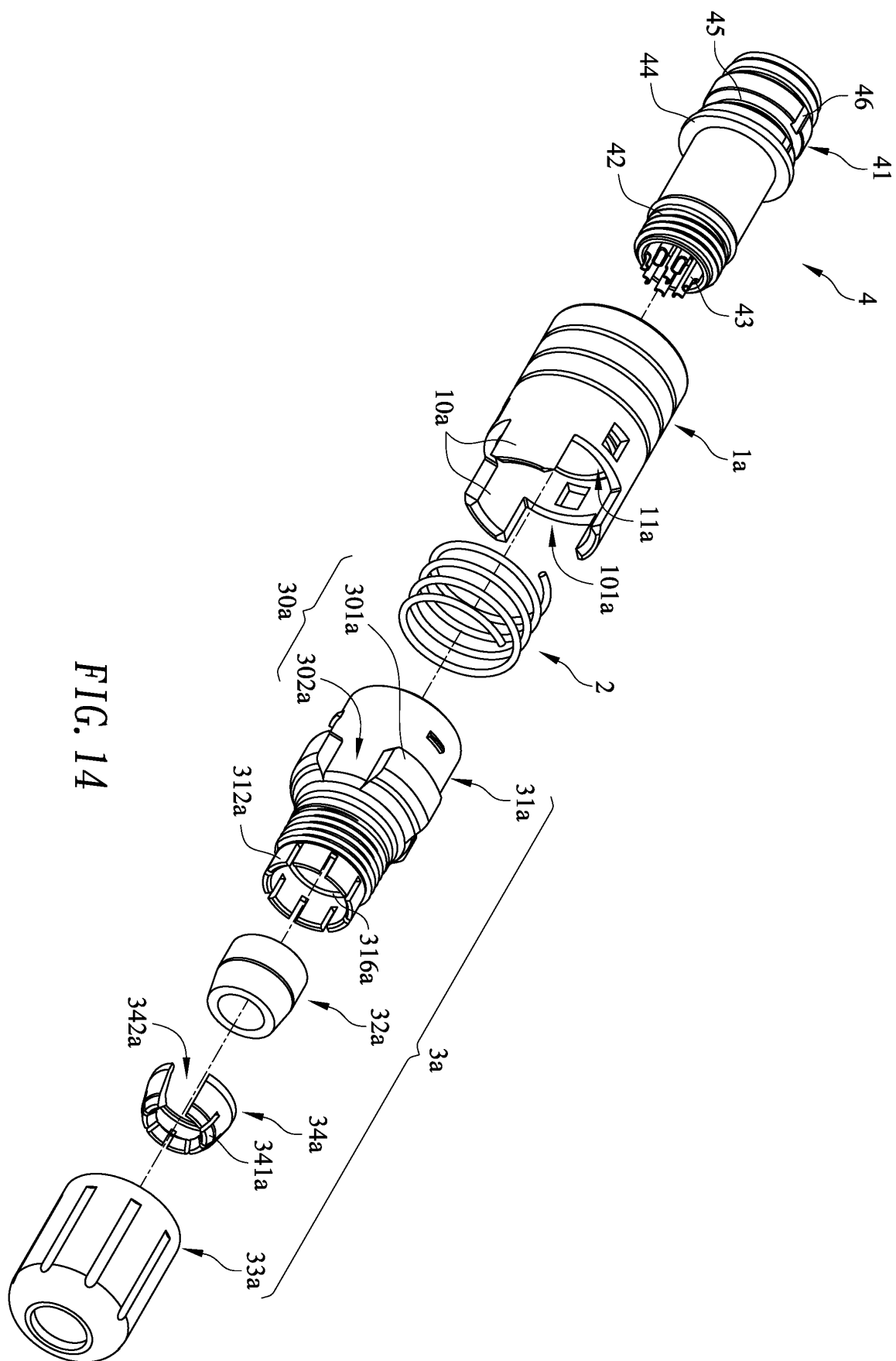


FIG. 14

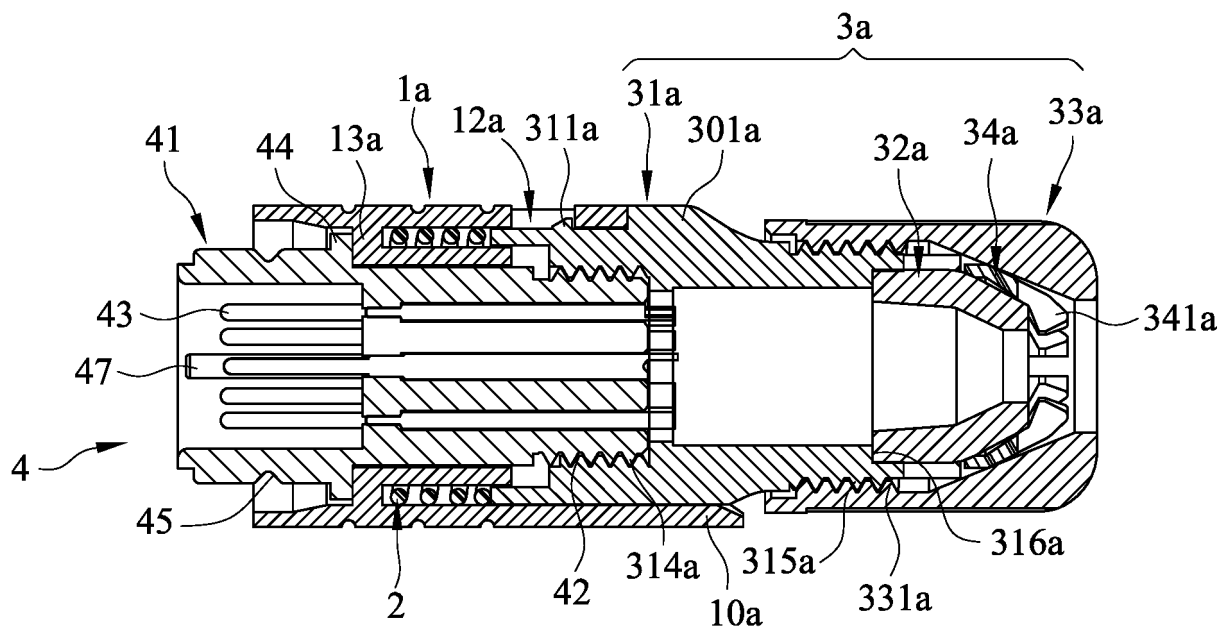


FIG. 15

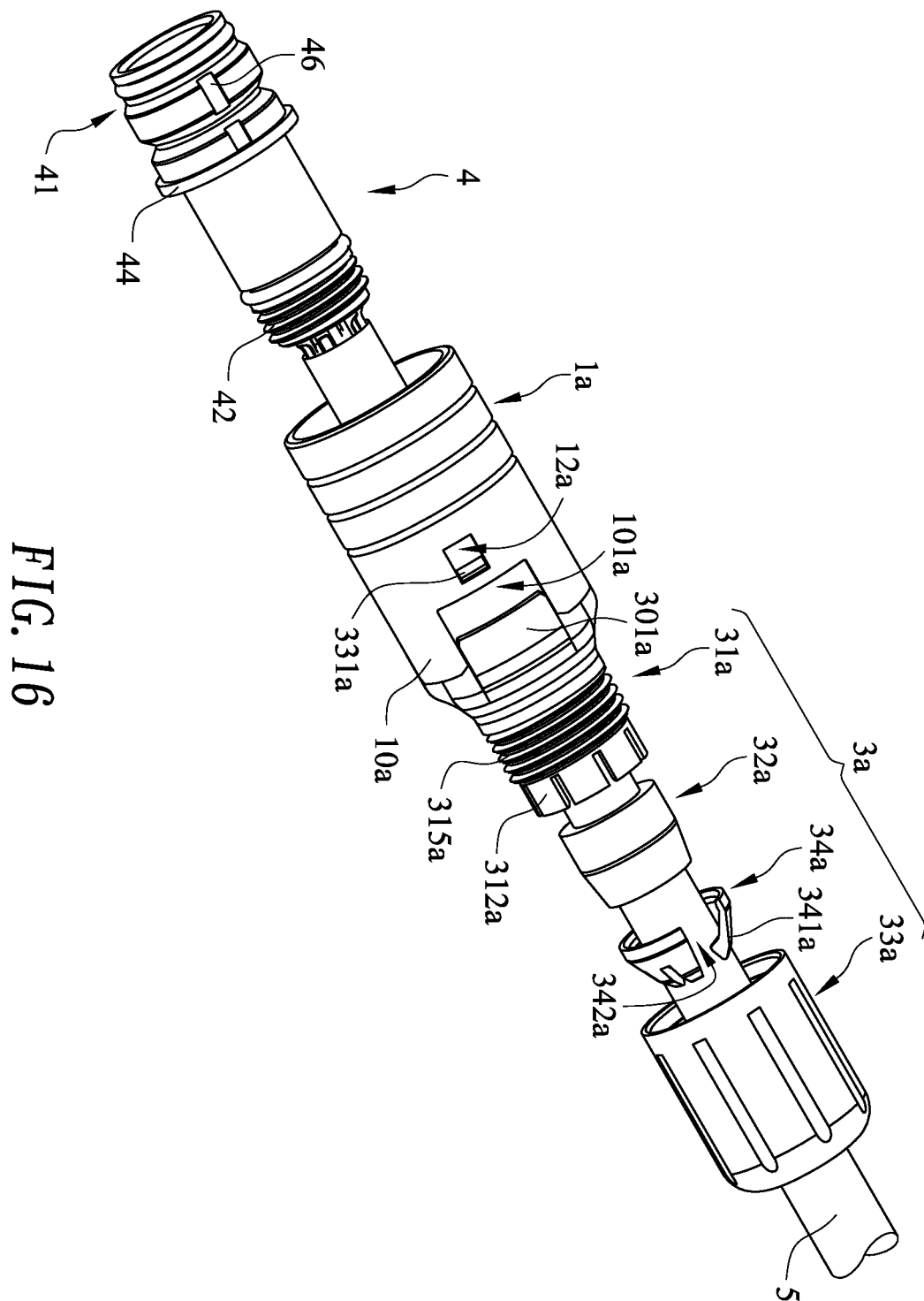


FIG. 16

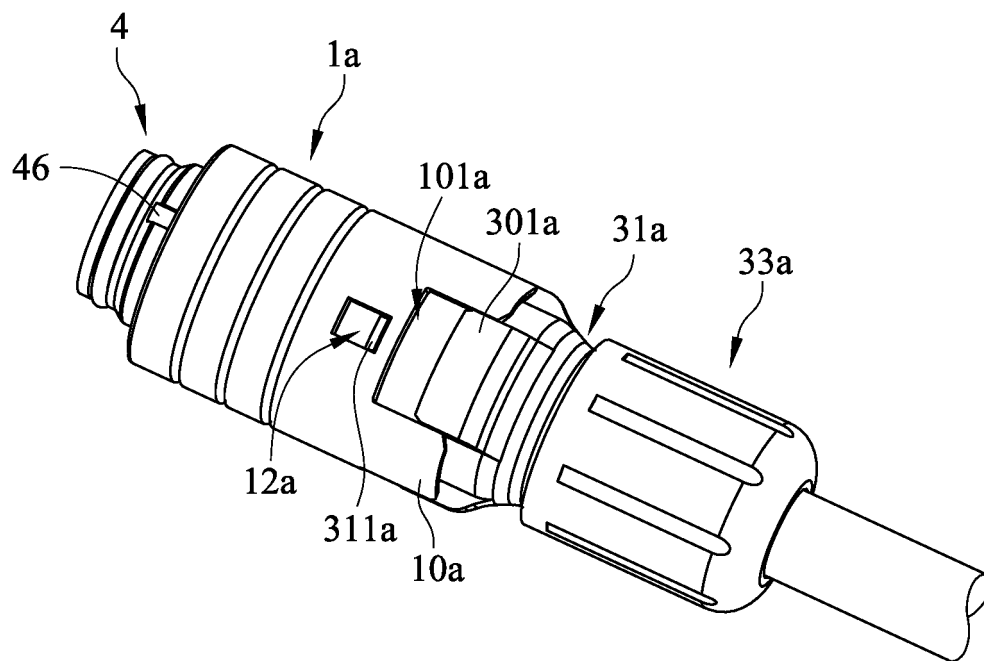


FIG. 17

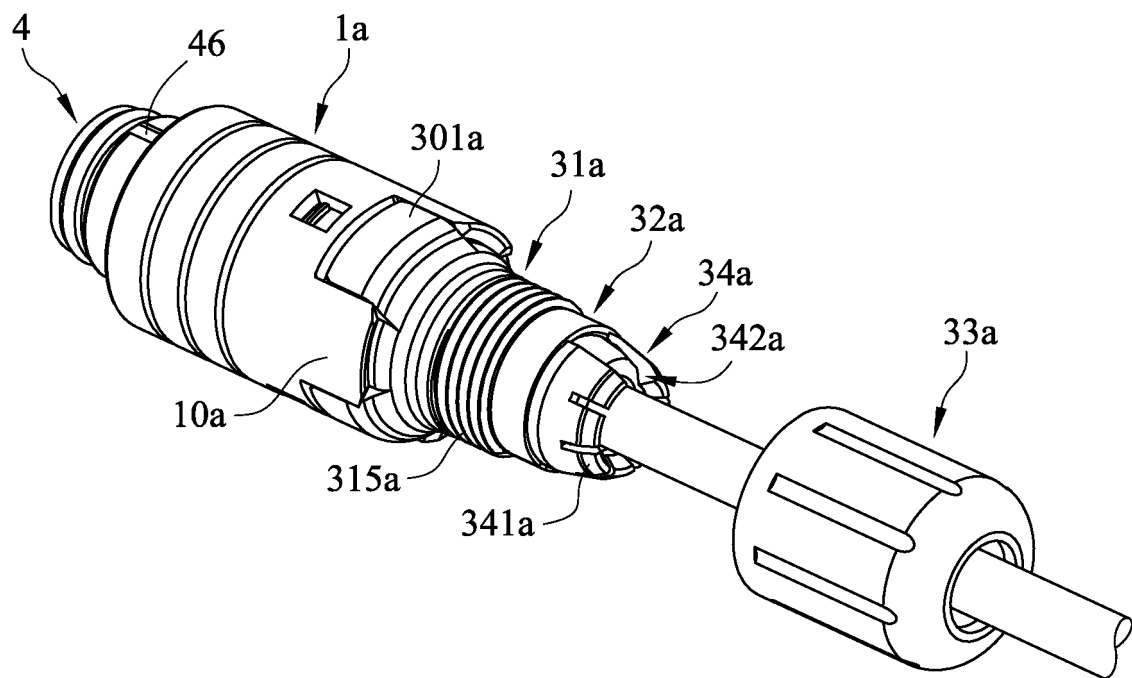


FIG. 18

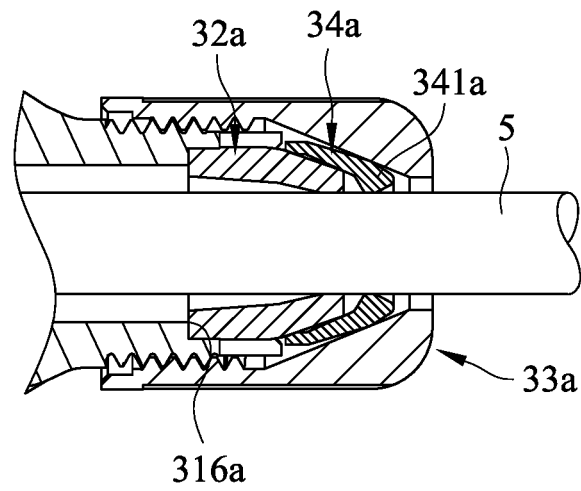


FIG. 19A

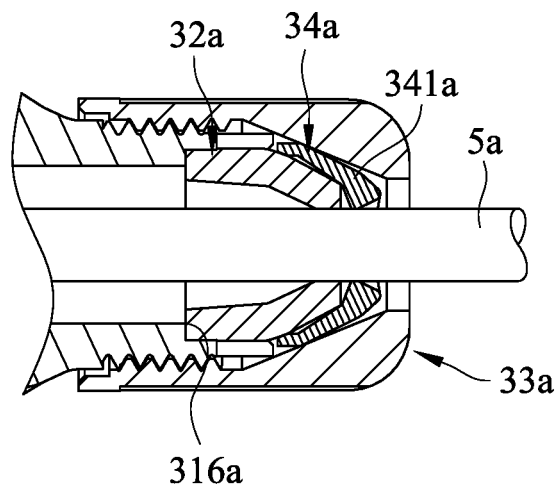


FIG. 19B

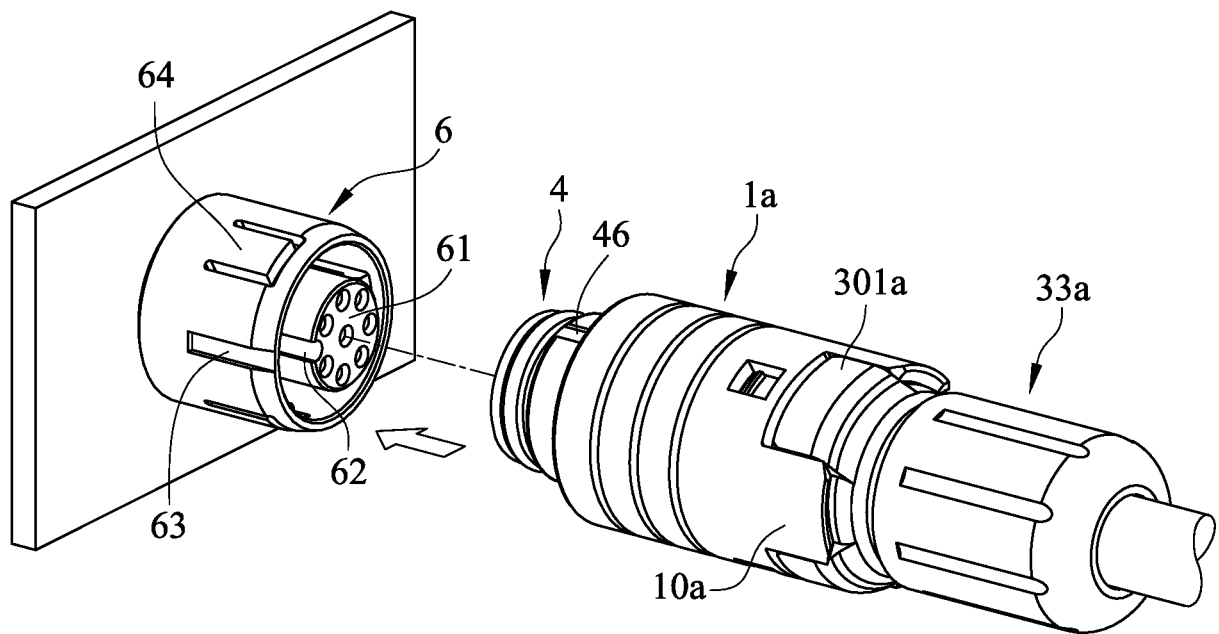


FIG. 20

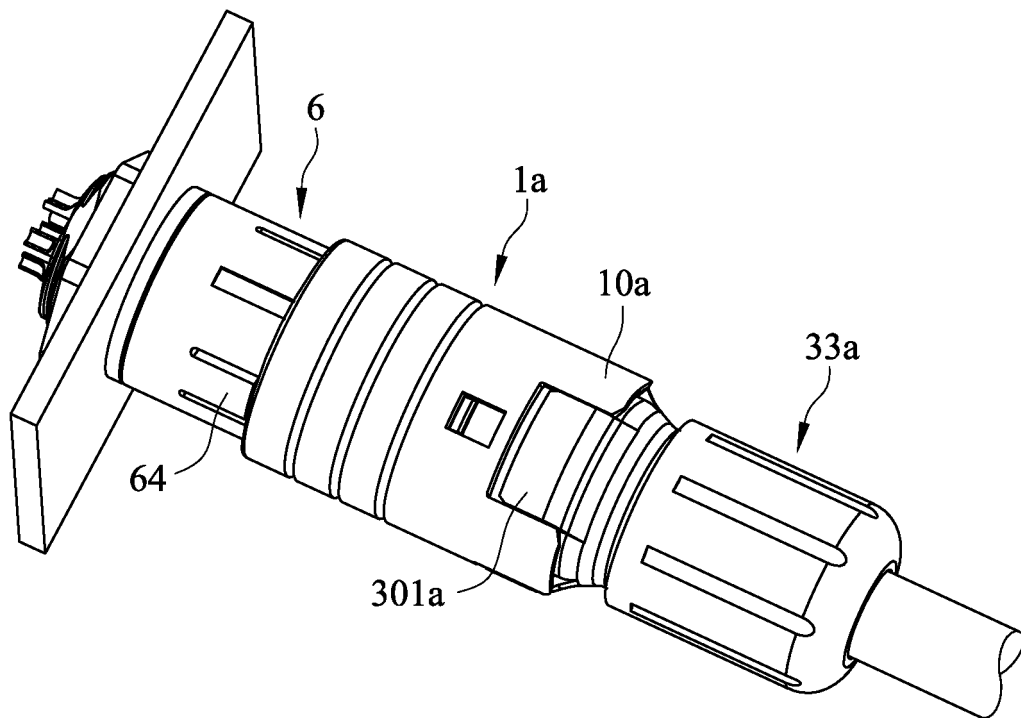


FIG. 21

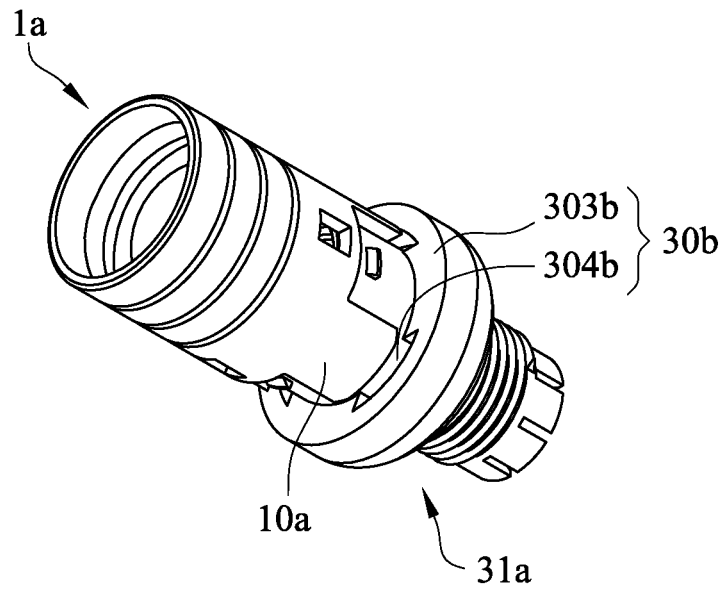


FIG. 22

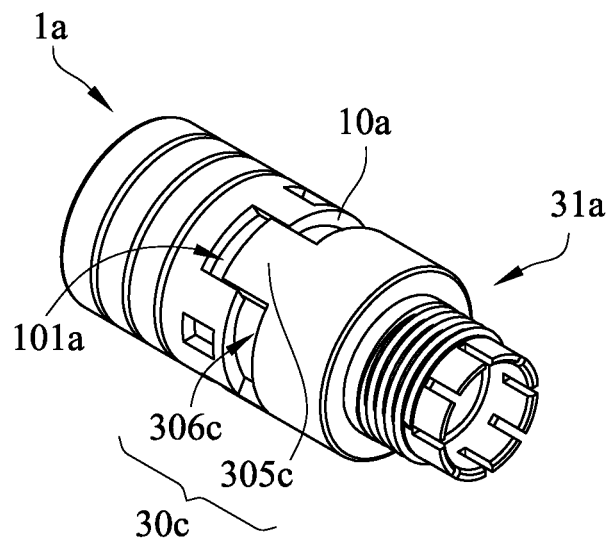
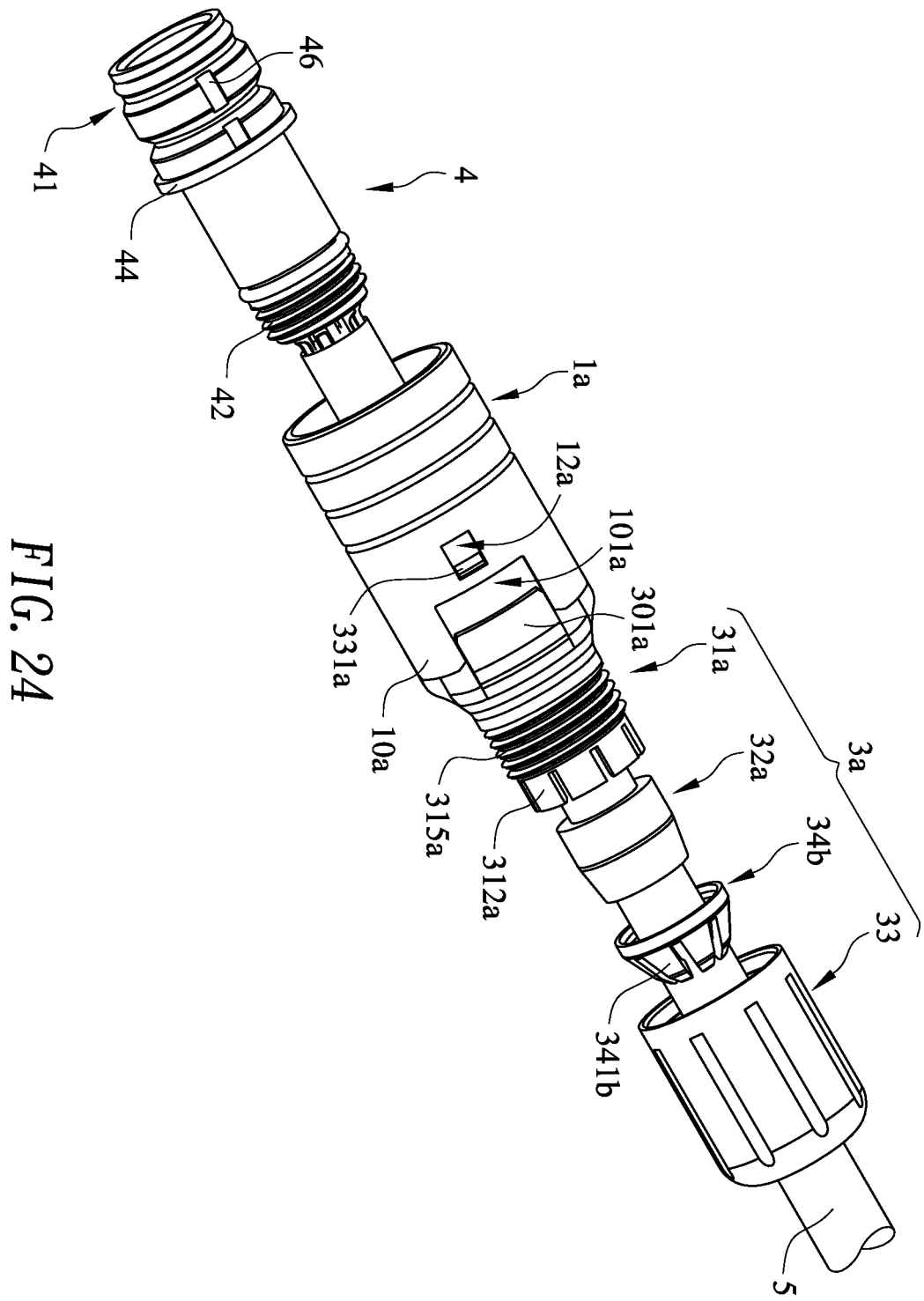


FIG. 23



REFERENCES CITED IN THE DESCRIPTION

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