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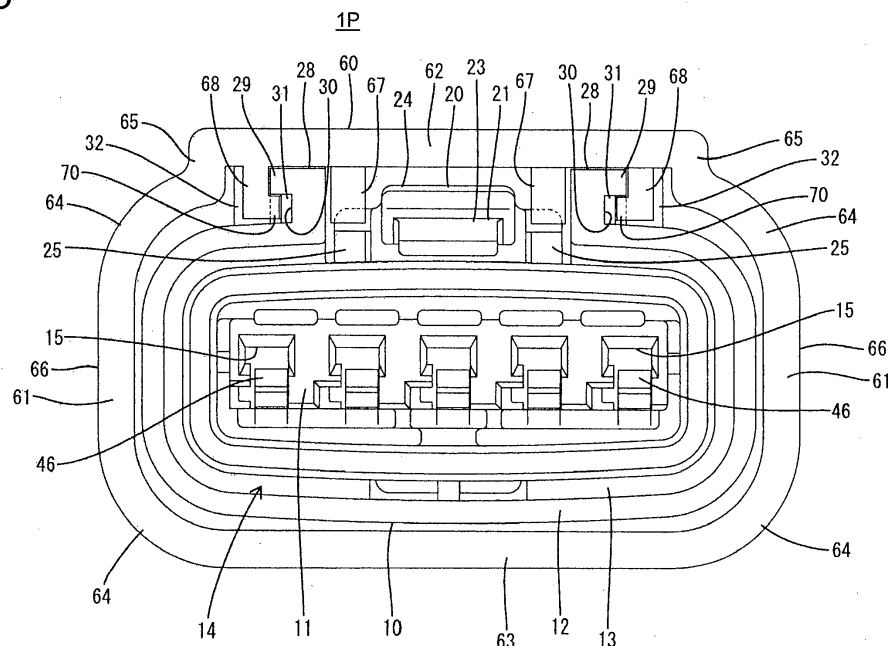
(54) **CONNECTOR, CONNECTOR ASSEMBLY AND METHOD OF ASSEMBLING IT**

(57) It is aimed to improve operability in moving a detecting member.

A connector includes a first housing 10 and a second housing 40 connectable to each other, and a detecting member 60 to be assembled movably to a standby position and a detection position with respect to the first

housing 10. The detecting member 60 includes grip portions 61 arranged to face and cover opposite side surfaces of the first housing 10 and enabling a moving operation to the detection position. An operator can move the detecting member 60 by gripping the grip portions 61.

FIG. 5



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Description

[0001] The present invention relates to a connector, a connector assembly and a method of assembling or producing it.

[0002] A connector assembly disclosed in Japanese Unexamined Patent Publication No. 2009-140675 includes a connector housing (hereinafter, referred to as a first housing) connectable to a mating connector (hereinafter, referred to as a second housing) and a slider (hereinafter, referred to as a detecting member) to be assembled movably to a standby position and a detection position with respect to the connector housing. The first housing includes a lock arm for holding the first and second housings in a connected state by resiliently locking a lock protrusion of the second housing.

[0003] The detecting member includes a plate-like main body portion supported on the lock arm and slidable along the upper surface (sliding surface) of the lock arm. An operating portion is provided to project on an upper part of the rear end of the main body portion. Further, the detecting member includes a deflectable detecting piece projecting forward. While the first and second housings are being connected, the detecting piece is locked by the lock arm, whereby the detecting member is held at the standby position. When the first and second housings are properly connected, the detecting piece is pressed by the lock protrusion to be released from locking with the lock arm, whereby a movement of the detecting member to the detection position is allowed. Here, an operator can bring the detecting member to the detection position by manually moving the detecting member forward while gripping the operating portion. Thus, it can be judged that the first and second housings are in a properly connected state when the detecting member reaches the detection position.

[0004] If the connector is reduced in size, an operation area of the operating portion also becomes relatively smaller. This causes a problem of making an operation difficult for the operator when the detecting member is moved from the standby position (as a particular first position) to the detection position (as a particular second position).

[0005] The present invention was completed based on the above situation and aims to improve operability in moving a detecting member.

[0006] This object is solved according to the invention by the features of the independent claims. Particular embodiments of the invention are subject of the dependent claims.

[0007] According to one aspect, there is provided a connector, comprising: a housing connectable to a mating housing; and a detecting member to be assembled movably to a first position and a second position with respect to the housing and configured to be held at the first position while the first housing is being connected to the mating housing and movable to the second position when the housing is properly connected to the mating

housing; the detecting member including one or more grip portions arranged to substantially face and at least partly cover substantially opposite side surfaces of the housing and enabling a moving operation to the second position.

[0008] According to a particular embodiment, the detecting member is enabled to reach the second position by being displaced in a direction away from the mating housing after the housing is properly connected to the mating housing.

[0009] Particularly, the detecting member includes at least one stopper portion configured to restrict a movement to the second position by being locked to the housing at the first position and/or release locking with the housing when the housing is properly connected to the mating housing.

[0010] Further particularly, the housing includes a lock arm configured to hold the housing in a connected state with the mating housing by resiliently locking the mating housing.

[0011] Further particularly, a locking portion to be locked to the mating housing is provided on or near a front part of the lock arm and/or an operating portion to be pressed in releasing locking with the mating housing is provided on or near a rear part of the lock arm.

[0012] Further particularly, the detecting member includes a ceiling portion bridging between the substantially facing grip portions.

[0013] Further particularly, the ceiling portion is arranged to cover the locking portion at the first position and arranged to cover the operating portion at the second position.

[0014] Further particularly, the housing is open at a position substantially corresponding to the lock arm so that the lock arm can be visually confirmed from outside in a state before the detecting member is assembled with the housing.

[0015] Further particularly, a part of the detecting member including the grip portions is formed into a tube at least partly surrounding the housing over the substantially entire circumference.

[0016] Further particularly, a length of the detecting member in the front-back direction is shorter than that of the housing,

[0017] According to a further aspect, there is provided a connector assembly comprising a connector according to the above aspect or a particular embodiment thereof and a mating connector having a mating housing connectable to the housing of the connector.

[0018] According to a particular embodiment, there is provided a connector assembly with a first housing and a second housing connectable to each other, and a detecting member to be assembled movably to a standby position and a detection position with respect to the first housing and configured to be held at the standby position while the first and second housings are being connected and movable to the detection position when the first and second housings are properly connected, the detecting

member including grip portions arranged to face and cover opposite side surfaces of the first housing and enabling a moving operation to the detection position.

[0019] Particularly, the detecting member is enabled to reach the detection position by being pulled in a direction away from the second housing after the first and second housings are properly connected and includes a stopper portion configured to restrict a movement to the detection position by being locked to the first housing at the standby position and release locking with the first housing when the first and second housings are properly connected. According to this, if it is attempted to move the detecting member to the detection position in a state where the first and second housings are not properly connected, the detecting member is separated together with the first housing from the second housing since locking between the stopper portion and the first housing is maintained. Thus, it can be clearly known that the first and second housings are not properly connected.

[0020] Further particularly, the first housing includes a lock arm configured to hold the first and second housings in a connected state by resiliently locking the second housing, a locking portion to be locked to the second housing is provided on a front part of the lock arm, an operating portion to be pressed in releasing locking with the second housing is provided on a rear part of the lock arm, the detecting member includes a ceiling portion bridging between the facing grip portions, and the ceiling portion is arranged to cover the locking portion at the standby position and arranged to cover the operating portion at the detection position. According to this, since the locking portion is covered by the ceiling portion when the detecting member is at the standby position, the locking portion can be stably locked to the second housing. Further, since the operating portion is covered by the ceiling portion when the detecting member is at the detection position, it can be prevented that the operating portion is inadvertently unlocked.

[0021] Further particularly, a part of the detecting member including the grip portions is formed into a tube surrounding the first housing over the entire circumference. According to this, the surrounding of the first housing is protected from external matters by the detecting member. Further, at which of the standby position and the detection position the detecting member 60 is located can be visually confirmed from any side of the circumferential direction.

[0022] According to a further aspect of the invention, there is provided a method of assembling (i.e. producing) a connector assembly, in particular according to the above aspect or a particular embodiment thereof, comprising: providing a housing and a mating housing being connectable with each other; movably assembling a detecting member to the housing movable between a first position and a second position with respect to the housing, wherein the detecting member is configured to be held at the first position while the first housing is being connected to the mating housing and movable to the sec-

ond position when the housing is properly connected to the mating housing; connecting or mating the housing and the mating housing; and operating one or more grip portions of the detecting member arranged to substantially face and at least partly cover substantially opposite side surfaces of the housing and enabling a moving operation to the second position.

[0023] According to a particular embodiment, the detecting member is configured such as to be enabled to reach the second position by being displaced in a direction away from the mating housing after the housing is properly connected to the mating housing.

[0024] Particularly, the detecting member is configured to include at least one stopper portion configured to restrict a movement to the second position by being locked to the housing at the first position and/or release locking with the housing when the housing is properly connected to the mating housing.

[0025] Further particularly, the housing is held in a connected state with the mating housing by resiliently locking a lock arm of the housing with the mating housing.

[0026] Since the grip portions are arranged to substantially face and/or at least partly cover the substantially opposite side surfaces of the first housing, an operator can easily grip the grip portions in moving the detecting member to the detection position and operability can be improved.

[0027] These and other objects, features and advantages of the present invention will become more apparent upon reading of the following detailed description of preferred embodiments and accompanying drawings. It should be understood that even though embodiments are separately described, single features thereof may be combined to additional embodiments.

FIG. 1 is a section showing a state before first and second housings are connected in a connector (assembly) according to an embodiment of the present invention,

FIG. 2 is a section showing a state where a lock arm is deflected and deformed while the first and second housings are being connected,

FIG. 3 is a section showing a state where the first and second housings are properly connected and locking between stopper portions and stopper receiving portions is released,

FIG. 4 is a section showing a state where a detecting member is moved to a detection position after the first and second housings are properly connected,

FIG. 5 is a front view showing a state where the detecting member is held at the standby position with respect to the first housing,

FIG. 6 is a plan view showing the state where the detecting member is held at the standby position with respect to the first housing,

FIG. 7 is a section showing the state where the detecting member is held at the standby position with respect to the first housing,

FIG. 8 is a plan view showing a state where the detecting member is held at the detection position with respect to the first housing,

FIG. 9 is a section showing the state where the detecting member is held at the detection position with respect to the first housing, and

FIG. 10 is a side view showing the state where the detecting member is held at the standby position with respect to the first housing.

<Embodiment>

[0028] Hereinafter, a particular embodiment of the present invention is described on the basis of the drawings. This embodiment includes a first housing 10 and a second housing 40 (as a particular mating housing) connectable to each other and a detecting member 60 to be assembled movably between a standby position 1 P (as a particular first position) and a detection position 2P (as a particular second position) with respect to the first housing 10. Note that, in the following description, sides substantially facing each other when the connection of the first and second housings 10, 40 is started are referred to as front sides concerning a front-back direction and a vertical direction is based on FIGS. 1 to 5 and 10. A width direction is synonymous with a lateral direction of FIG. 5.

[0029] The second housing 40 is made e.g. of synthetic resin and includes, as shown in FIG. 1, a tubular receptacle 42 substantially projecting forward. One or more (particularly male) tabs 43 of second terminal fittings 42 are arranged to at least partly project into the receptacle 41. At least one lock portion 44 is provided to project on the lateral (particularly upper) surface of the lateral (particularly upper) wall of the receptacle 41. Further, one or more, particularly a pair of releasing portions 45 (only one is shown in FIG. 1) are provided to project adjacent of the lock portion 44 (particularly at substantially opposite widthwise sides of the lock portion 44) on the lateral (upper) surface of the lateral (upper) wall of the receptacle 41. The releasing portion 45 particularly is in the form of at least one rib substantially extending in a front-back direction particularly with a front end reaching the front end of the receptacle 41 and/or a rear end arranged at the substantially same position as the rear end of the lock portion 44 in the front-back direction.

[0030] The first housing 10 is made e.g. of synthetic resin and includes, as shown in FIGS. 1 and 5, a housing main body 11 particularly substantially in the form of a block long in the width direction, a tubular fitting tube portion 12 at least partly surrounding the outer periphery of the housing main body 11 and/or a coupling portion 13 coupling the fitting tube portion 12 and the housing main body 11. A space between the fitting tube portion 12 and the housing main body 11 and before the coupling portion 13 particularly is open as a connection space 14 into which the receptacle 41 of the second housing 40 at least partly is fittable or insertable.

[0031] As shown in FIG. 5, one or more, particularly a

plurality of cavities 15 are provided (particularly substantially side by side in the width direction) in the housing main body 11. A first terminal fitting 16 at least partly is inserted or insertable into each cavity 15 from an insertion side, particularly substantially from behind. Further, a displaceable or deflectable locking lance 46 for retaining and locking the first terminal fitting 16 is provided at the lateral (lower) surface of the inner wall of each cavity 15. As shown in FIG. 3, the first terminal fitting 16 particularly includes a box portion 17 into which the male tab 43 is at least partly inserted for connection when the first and second housings 10, 40 are properly connected, and a wire connection portion (particularly comprising a barrel portion 19) located behind the box portion 17 and to be connected (particularly crimped and connected) to an end part of a wire 18 and particularly a resilient or rubber plug 50.

[0032] As shown in FIGS. 1 and 5, a lock arm 20 is connected in a widthwise intermediate part (particularly substantially a widthwise central part) of the lateral (upper) surface of the housing main body 11. The lock arm 20 includes an arm main body 21 which is swingably displaced (resiliently displaced) substantially in a seesaw manner. The arm main body 21 is provided with a lock hole 22, a locking portion 23 located on or near a front end part and defining the front end of the lock hole 22 and/or an operating portion 24 particularly located on a rear end part and/or projecting to be slightly higher. As shown in FIG. 3, the lock portion 44 at least partly fitted in the lock hole 22 is arranged to be able to lock the locking portion 23 when the first and second housings 10 40 are properly connected. Further, the operating portion 24 is pressed or pressable from outside or above in releasing locking between the locking portion 23 and the lock portion 44.

[0033] As shown in FIG. 5, one or more, particularly a pair of stopper receiving portions 25 are provided to project adjacent to the lock arm 20 (particularly at substantially opposite widthwise sides of the lock arm 20) on the lateral (upper) surface of the housing main body 11. The stopper receiving portions 25 particularly substantially are in the form of vertical walls extending along the front-back direction and distal (upper) end parts thereof particularly are integrally or unitarily coupled to substantially opposite side surfaces of the lock arm 20. As shown in FIG. 1, a front corner of the upper end of the stopper receiving portion 25 particularly is formed into a receiving surface 26 chamfered or bent into a curved surface. At least one (later-described) stopper portion 67 of the detecting member 60 can come into contact with the receiving surface 26. An escaping groove 27 is provided to be open outward or upward and/or backward on a rear part of the stopper receiving portion 25.

[0034] A distal (particularly upper) part of the fitting tube portion 12 particularly is open at a position substantially corresponding to the lock arm 20 and the (particularly substantially entire) lock arm 20 can be visually confirmed from outside (above) in a state before the detecting

member 60 is assembled with the first housing 10.

[0035] As shown in FIG. 5, the fitting tube portion 12 is provided with one or more, particularly a pair of side wall portions 28 projecting or erected adjacent to (particularly at substantially opposite widthwise sides of) the lock arm 20. The (particularly both) side wall portion(s) 28 particularly extend(s) over the entire length of the fitting tube portion 12 in the front-back direction. One or more protruding portions 29 substantially extending in the front-back direction are provided to protrude outwardly on the lateral (upper) ends of the (both) side wall portion(s) 28. One or more rail grooves 30 are defined adjacent (particularly between) the protruding portion(s) 29 and/or substantially facing lateral (upper) surface parts of the fitting tube portion 12. As shown in FIG. 7, a (particularly substantially claw-like) contact stop portion 31 is provided to at least partly project into the rail groove 30 at an intermediate position of the side wall portion 28 in the front-back direction. A later-described fitting portion of the detecting member 60 at least partly is fittable and insertable into the rail groove 30 and a later-described contact portion 71 of the detecting member 60 can come into contact with the contact stop portion 31.

[0036] As shown in FIG. 6, one or more, particularly a pair of separation restricting portions 32 are provided to project at widthwise outer side(s) of the (both) protruding portion(s) 29 on (particularly the rear end of) the lateral (upper) surface of the fitting tube portion 12. The separation restricting portion(s) 32 particularly is/are integrally or unitarily connected to the side wall portion(s) 28.

[0037] The detecting member 60 is made e.g. of synthetic resin, particularly substantially has a tubular shape as a whole and, as shown in FIG. 5, substantially surrounds the outer periphery of the first housing 10 over the entire circumference. A length of the detecting member 60 in the front-back direction particularly is shorter than that of the first housing 10, but longer than half the length of the first housing 10 in the front-back direction. The detecting member 60 particularly is arranged to at least partly cover a front part of the first housing 10 at the standby position 1 P as shown in FIGS. 6 and 10, arranged to at least partly cover a rear part of the first housing 10 at the detection position 2P as shown in FIG. 8 and/or movable from the standby position 1 P toward the detection position 2P particularly by being manually pulled or displaced.

[0038] Specifically, as shown in FIG. 5, the detecting member 60 is composed of or comprises one or more, particularly a pair of grip portions 61 arranged to face substantially opposite widthwise end parts of the first housing 10, a ceiling portion 62 arranged to bridge between the lateral (upper) ends of the both grip portions 61 and a bottom or base portion 63 arranged to bridge between the lateral (lower) ends of the both grip portions 61.

[0039] Corner portions 64 particularly substantially in the form of curved surfaces substantially parallel to four corner portions of the fitting tube portion 12 particularly

are provided on both upper and lower end parts of the grip portions 61. At least one stand-up portion 65 standing up or projecting from the corner portion 64 is provided on the distal or upper end part of the grip portion 61. The stand-up portion 65 particularly is arranged substantially in parallel to the side wall portion 28. At least one grip surface 66 substantially extending along the vertical direction (or a direction intersecting a connection and separation direction of the housings 10, 40) is arranged on the outer surface of the grip portion 61 particularly substantially between the upper and lower corner portions 64. An operator's fingers are or can be placed on the grip surfaces 66 of the grip portions 61 when the detecting member 60 is moved or operated.

[0040] As shown in FIG. 5, the one or more stopper portions 67 (particularly paired in the width direction) are provided to project downward or inward on the ceiling portion 62, and one or more, particularly a pair of rail portions 68 are provided to project downward or inward at widthwise outer side(s) of the (both) stopper portion(s) 67. As shown in FIG. 1, the stopper portion 67 particularly integrally or unitarily extends obliquely downward toward the back in a cantilever manner at an intermediate position of the ceiling portion 62 in the front-back direction and/or is deflectable and deformable with a coupled position to the ceiling portion 62 as a supporting point. A contact surface 69 (particularly recessed into a curved surface) is provided on an extending end part (rear end part) of the stopper portion 67. The contact surface 69 can be at least partly fitted to and held in contact with the receiving surface 26 of the stopper receiving portion 25.

[0041] The (both) rail portion(s) 68 particularly extend(s) over the substantially entire length of the ceiling portion 62 in the front-back direction. As shown in FIG. 5, at least one fitting portion 70 is provided to protrude inwardly on the lower end of the rail portion 68. Further, as shown in FIG. 5, the (particularly substantially claw-like) contact portion 71 is provided to project at an intermediate position in the front-back direction on the protruding end (inner end) of the fitting portion 70.

[0042] Next, functions and effects of this embodiment are described.

[0043] In assembling, the detecting member 60 is externally mounted on the first housing 10 e.g. from front. The detecting member 60 has a movement in one direction (e.g. backward movement) restricted by the contact of the contact surface(s) 69 of the stopper portion(s) 67 with the receiving surface(s) 26 of the stopper receiving portion(s) 25 as shown in FIG. 1 and has a movement in another substantially opposite direction (e.g. forward movement) restricted by the contact of the contact portion(s) 71 of the rail portion(s) 68 with the contact stop portion(s) 31 of the side wall portion(s) 28, thereby being held in a movement restricted state at the standby position 1 P (as a particular first position). At the standby position 1P, the locking portion 23 is covered from above by the ceiling portion 62 and the operating portion 24 is open outward or upward.

[0044] When the first and second housings 10, 40 are connected to each other and the receptacle 41 of the second housing 40 at least partly is inserted into the connection space 14 of the first housing 10, the locking portion 23 interferes with the lock portion 44 to move onto the lock portion 44 and the lock arm 20 is deflected and deformed as shown in FIG. 2. During this time, since the state where the locking portion 23 at least partly is covered from above by the ceiling portion 62 is maintained, the interference of external matters with the locking portion 23 is avoided and the stability of a locking operation is ensured. Thereafter, when the first and second housings 10, 40 reach a substantially proper connection position as shown in FIG. 3, the lock arm 20 resiliently at least partly returns and the lock portion 44 at least partly is fitted into the lock hole 22 and arranged to be able to lock the locking portion 23. In this way, the first and second housings 10, 40 are held in a state where separation from each other is restricted.

[0045] Further, the releasing portion(s) 45 press(es) front oblique surface(s) of the stopper portion(s) 67 to resiliently deflect and deform the stopper portion(s) 67 particularly substantially at the same time as the first and second housings 10, 40 reach the proper connection position. Associated with that, the contact surface(s) 69 of the stopper portion(s) 67 is/are separated from the receiving surface(s) 26 of the stopper receiving portion(s) 25, thereby releasing locking between the stopper portion(s) 67 and the stopper receiving portion(s) 25 as shown in FIG. 3.

[0046] In the above state, the index finger and thumb or the like of the operator are pressed against the grip surface(s) 66 of the (both) grip portion(s) 61 and the entire detecting member 60 is displaced (particularly pulled) backward while being sandwiched between both fingertips. Then, the detecting member 60 is moved backward toward the detection position 2P (as a particular second position) with respect to the first and second housings 10, 40 in the connected state. At this time, the fitting portion(s) 70 of the rail portion(s) 68 slide(s) in the rail groove(s) 30 of the side wall portion(s) 28, whereby a movement of the detecting member 60 is guided. When the detecting member 60 reaches the detection position 2P (second position), the rear end(s) of the rail portion(s) 68 come(s) into contact with the separation restricting portion(s) 32 of the first housing 10 as shown in FIG. 9, thereby restricting the separation of the detecting member 60 from the first housing 10. Further, as shown in FIG. 4, the stopper portion(s) 67 resiliently return(s) to be at least partly fitted into the escaping groove(s) 27 of the stopper receiving portion(s) 25, thereby restricting a return movement of the detecting member 60 to the standby position 1P.

[0047] Further, at the detection position 2P, the operating portion 24 of the lock arm 20 at least partly is covered from above or outside by the ceiling portion 62 and external matters are less likely to interfere with the upper surface of the operating portion 24. As a result, it can be

prevented that the lock arm 20 is inadvertently unlocked.

[0048] The operator may misunderstand that the first and second housings 10, 40 are properly connected and pull the detecting member 60 backward (toward the detection position 2P) although they are in an incompletely connected state. In this case, the lock portion 44 has not reached a position to be lockable to the lock arm 20, whereas locking between the stopper portions 67 and the stopper receiving portions 25 is maintained (see FIG. 2). Thus, the detecting member 60 is or can be separated together with the first housing 10 from the second housing 40. Therefore, it can be clearly known that the first and second housings 10, 40 have not reached the proper connection position yet.

[0049] As described above, since the grip portion(s) 61 of the detecting member 60 particularly are arranged to substantially face and/or cover the (particularly substantially opposite) side surface(s) of the first housing 10 according to this embodiment, the operator can easily grip the grip portions 61 in moving the detecting member 60 to the detection position 2P and operability can be improved. In addition, since the detecting member 60 particularly is formed into a tube surrounding the first housing 10 over the entire circumference, at which of the standby position 1P and the detection position 2P the detecting member 60 is located can be visually confirmed from any side of the circumferential direction. As a result, the operator can confirm the position of the detecting member 60 without any problem even if a mounting posture of the connector is changed or the like.

[0050] Accordingly, to improve operability in moving a detecting member, a connector assembly includes a first housing 10 and a second housing 40 connectable to each other, and a detecting member 60 to be assembled movably to a standby position (first position) 1P and a detection position (second position) 2P with respect to the first housing 10. The detecting member 60 includes one or more grip portions 61 arranged to substantially face and at least partly cover one or more (particularly substantially opposite) side surfaces of the first housing 10 and enabling a moving operation to the detection position. An operator can move the detecting member 60 by gripping the grip portions 61.

<Other Embodiment>

[0051] Other embodiments are briefly described below.

(1) The detecting member may not necessarily be in the form of a tube surrounding the first housing over the entire circumference and suffices to include at least the grip portion(s) covering the (particularly substantially opposite) side surface(s) of the first housing. For example, the detecting member may be in the form of a gate as a whole by including a ceiling portion and a pair of grip portions projecting from substantially opposite ends of the ceiling por-

tion.

(2) The detecting member may move forward from the standby position toward the detection position with respect to the first housing.

(3) A non-slip portion formed of a multitude of projecting and recessed streaks or the like may be provided on the grip surface of the grip portion.

Reference Signs

[0052]

10 ...	first housing (housing)
11 ...	housing main body
20 ...	lock arm
23 ...	locking portion
24 ...	operating portion
40 ...	second housing (mating housing)
44 ...	lock portion
45 ...	releasing portion
60 ...	detecting member
61 ...	grip portion
62 ...	ceiling portion
66 ...	grip surface
67 ...	stopper portion

Claims

1. A connector, comprising:

a housing (10) connectable to a mating housing (40); and
 a detecting member (60) to be assembled movably to a first position (1 P) and a second position (2P) with respect to the housing (10) and configured to be held at the first position (1 P) while the first housing (10) is being connected to the mating housing (40) and movable to the second position (2P) when the housing (10) is properly connected to the mating housing (40);
 the detecting member (60) including one or more grip portions (61) arranged to substantially face and at least partly cover substantially opposite side surfaces of the housing (10) and enabling a moving operation to the second position (2P).

2. A connector according to claim 1, wherein the detecting member (60) is enabled to reach the second position (2P) by being displaced in a direction away from the mating housing (40) after the housing (10) is properly connected to the mating housing (40).

3. A connector according to any one of the preceding claims, wherein the detecting member (60) includes at least one stopper portion (67) configured to restrict a movement to the second position (2P) by being locked to the housing (10) at the first position (1 P)

and/or release locking with the housing (10) when the housing (10) is properly connected to the mating housing (40).

4. A connector according to any one of the preceding claims, wherein the housing (10) includes a lock arm (20) configured to hold the housing (10) in a connected state with the mating housing (40) by resiliently locking the mating housing (40).

5. A connector according to claim 4, wherein a locking portion (23) to be locked to the mating housing (40) is provided on or near a front part of the lock arm (20) and/or an operating portion (24) to be pressed in releasing locking with the mating housing (40) is provided on or near a rear part of the lock arm (20).

6. A connector according to claim 4 or 5, wherein the detecting member (60) includes a ceiling portion (62) bridging between the substantially facing grip portions (61).

7. A connector according to claim 6, wherein the ceiling portion (62) is arranged to cover the locking portion (23) at the first position (1 P) and arranged to cover the operating portion (24) at the second position (2P).

8. A connector according to any one of the preceding claims 3 to 7, wherein the housing (10) is open at a position substantially corresponding to the lock arm (20) so that the lock arm (20) can be visually confirmed from outside in a state before the detecting member (60) is assembled with the housing (10).

9. A connector according to any one of the preceding claims, wherein a part of the detecting member (60) including the grip portions (61) is formed into a tube at least partly surrounding the housing (10) over the substantially entire circumference.

10. A connector according to any one of the preceding claims, wherein a length of the detecting member (60) in the front-back direction is shorter than that of the housing (10),

11. A connector assembly comprising a connector according to any one of the preceding claims and a mating connector having a mating housing (40) connectable to the housing (10) of the connector.

12. A method of assembling a connector assembly, comprising:

providing a housing (10) and a mating housing (40) being connectable with each other;
 movably assembling a detecting member (60) to the housing (10) movable between a first po-

sition (1 P) and a second position (2P) with respect to the housing (10), wherein the detecting member (60) is configured to be held at the first position (1 P) while the first housing (10) is being connected to the mating housing (40) and movable to the second position (2P) when the housing (10) is properly connected to the mating housing (40);
connecting the housing (10) and the mating housing (40); and
operating one or more grip portions (61) of the detecting member (60) arranged to substantially face and at least partly cover substantially opposite side surfaces of the housing (10) and enabling a moving operation to the second position (2P).

13. A method according to claim 12, wherein the detecting member (60) is configured such as to be enabled to reach the second position (2P) by being displaced in a direction away from the mating housing (40) after the housing (10) is properly connected to the mating housing (40).
14. A method according to claim 12 or 13, wherein the detecting member (60) is configured to include at least one stopper portion (67) configured to restrict a movement to the second position (2P) by being locked to the housing (10) at the first position (1 P) and/or release locking with the housing (10) when the housing (10) is properly connected to the mating housing (40).
15. A method according to any one of the preceding claims 12 to 14, wherein the housing (10) is held in a connected state with the mating housing (40) by resiliently locking a lock arm (20) of the housing (10) with the mating housing (40).

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FIG. 1

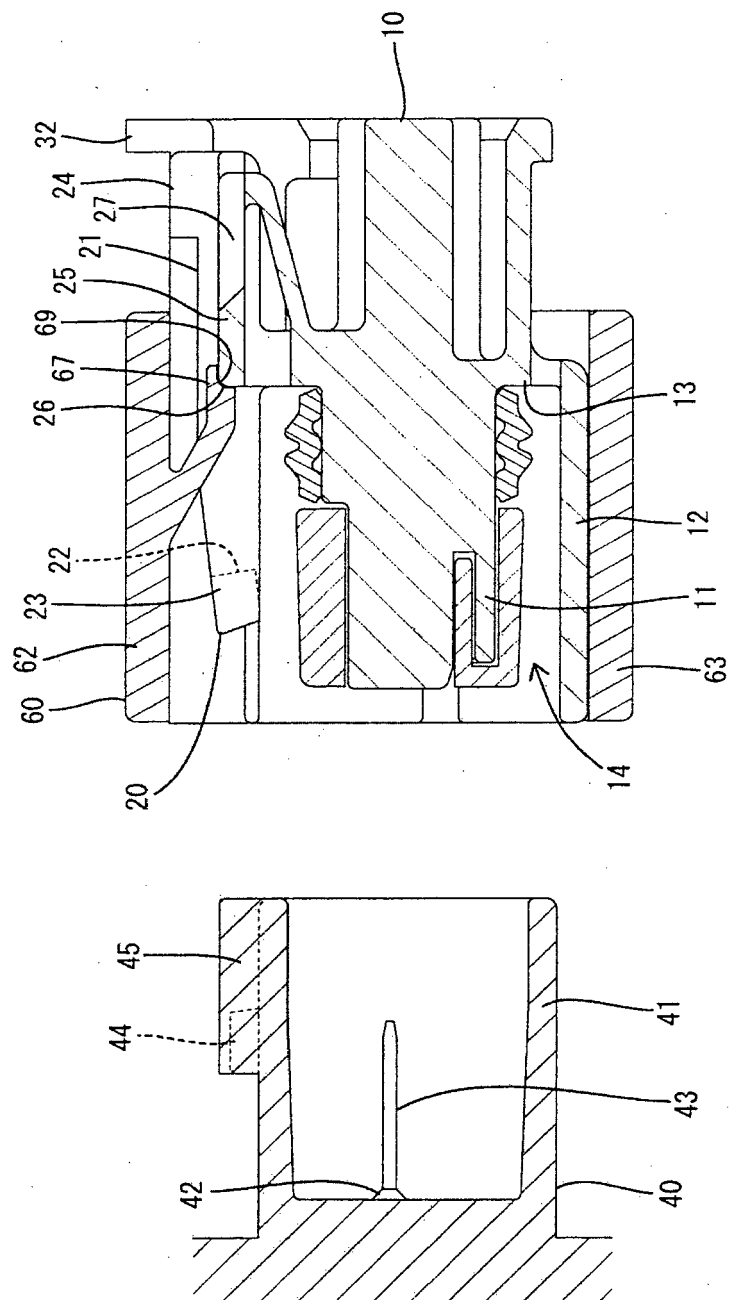


FIG. 2

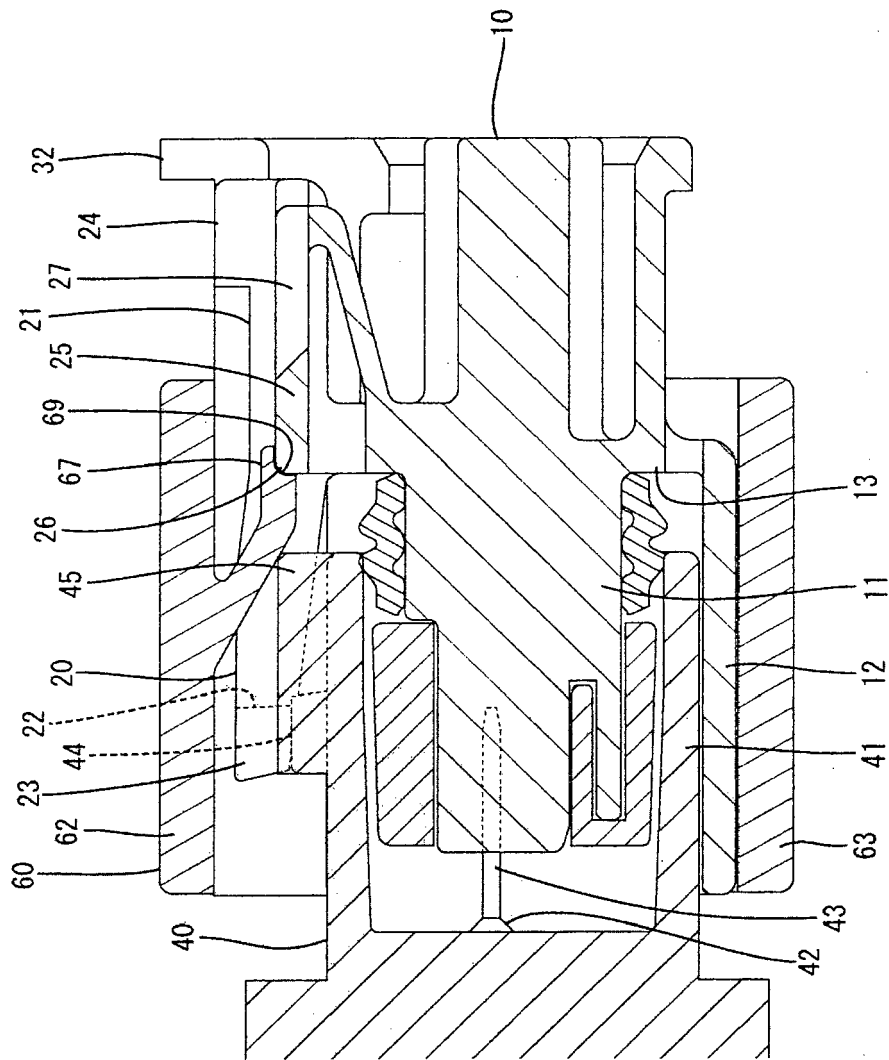


FIG. 3

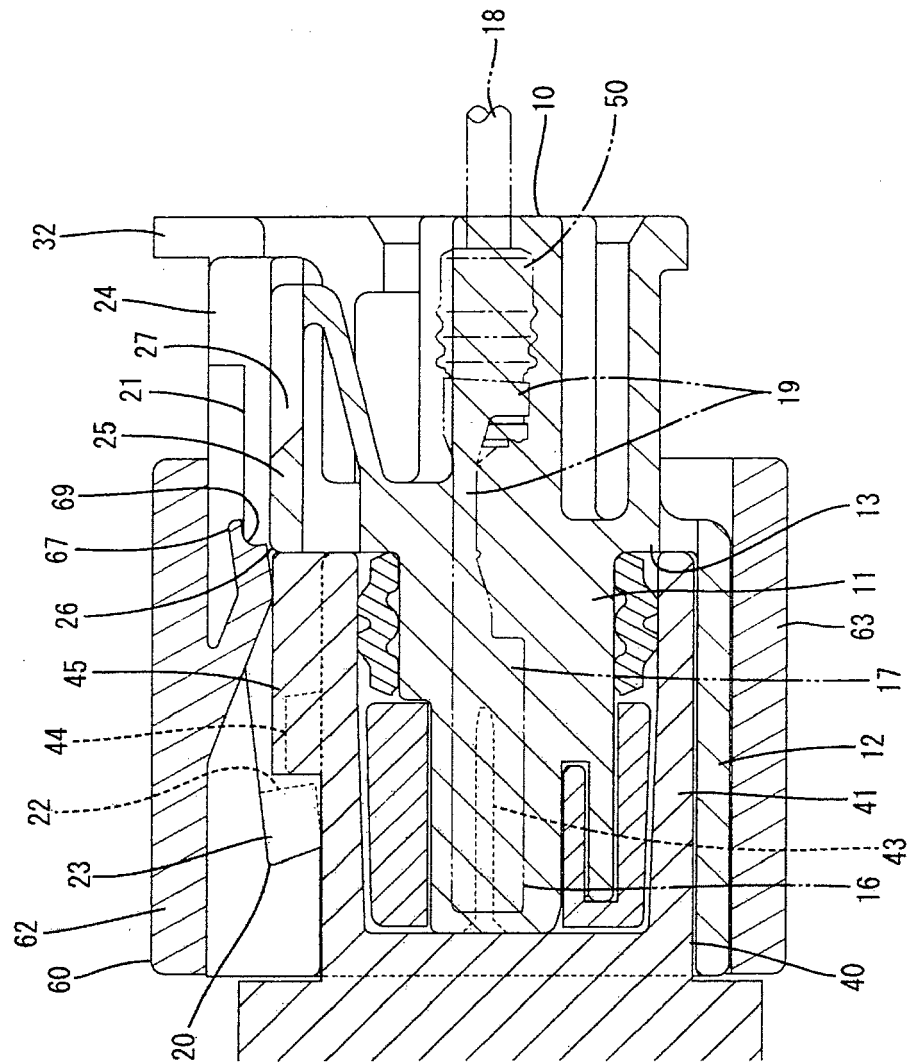


FIG. 4

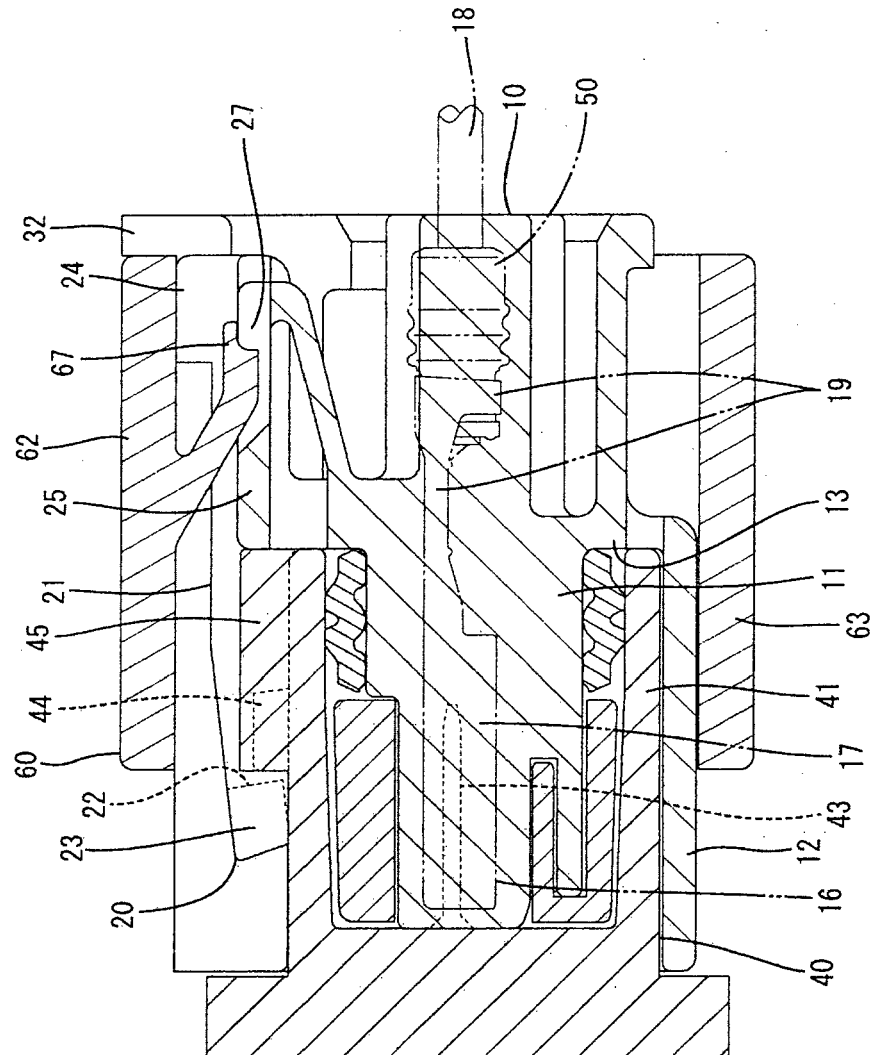


FIG. 5

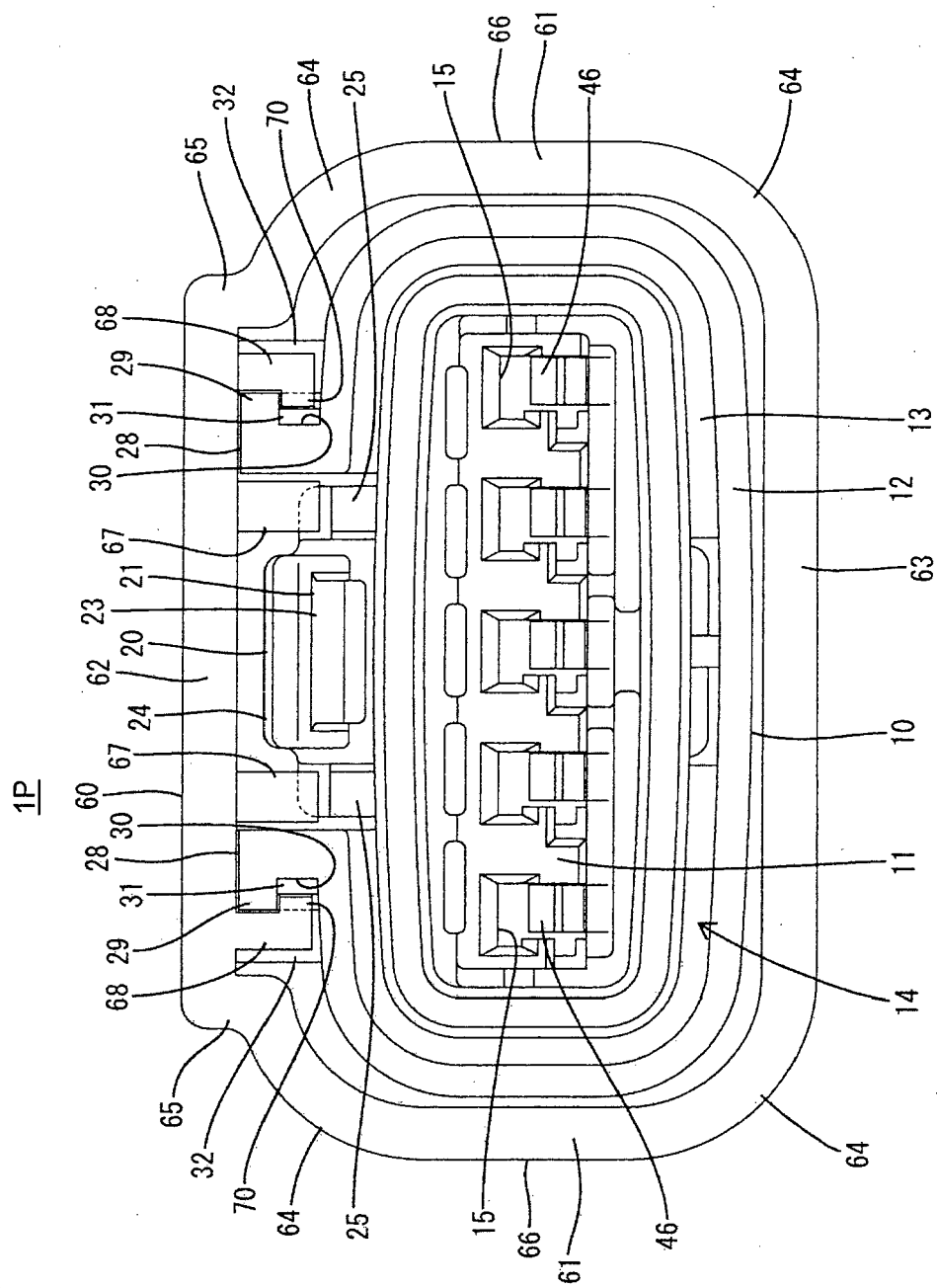


FIG. 6

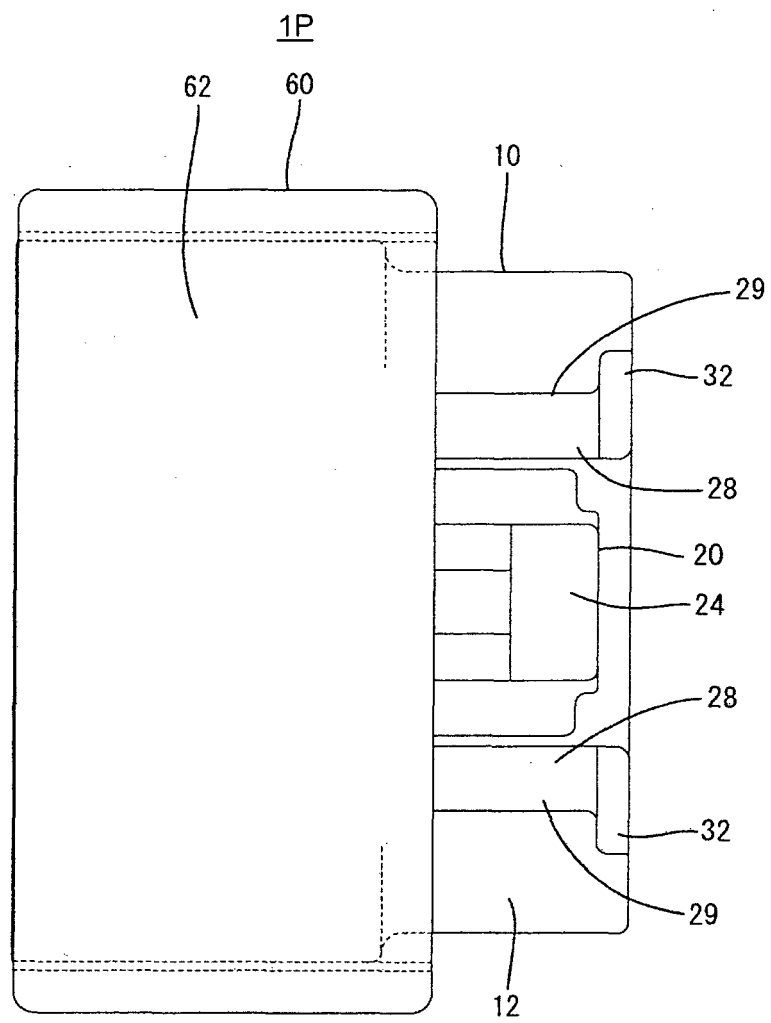


FIG. 7

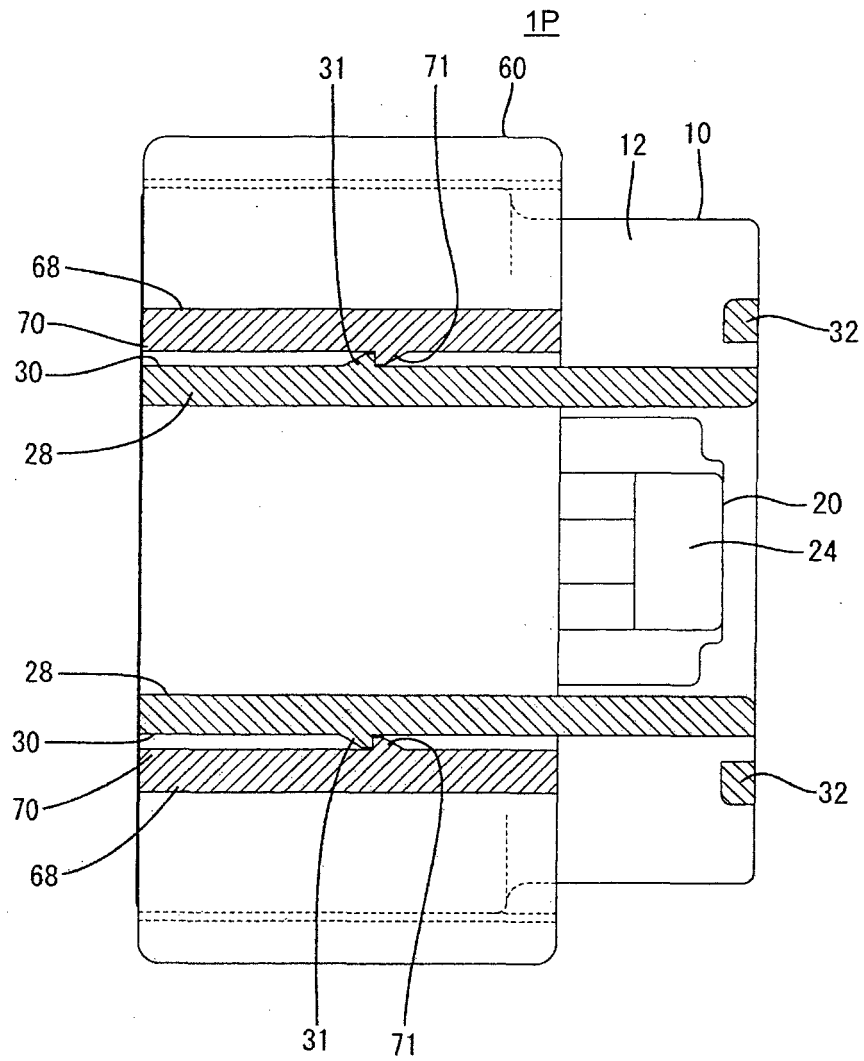


FIG. 8

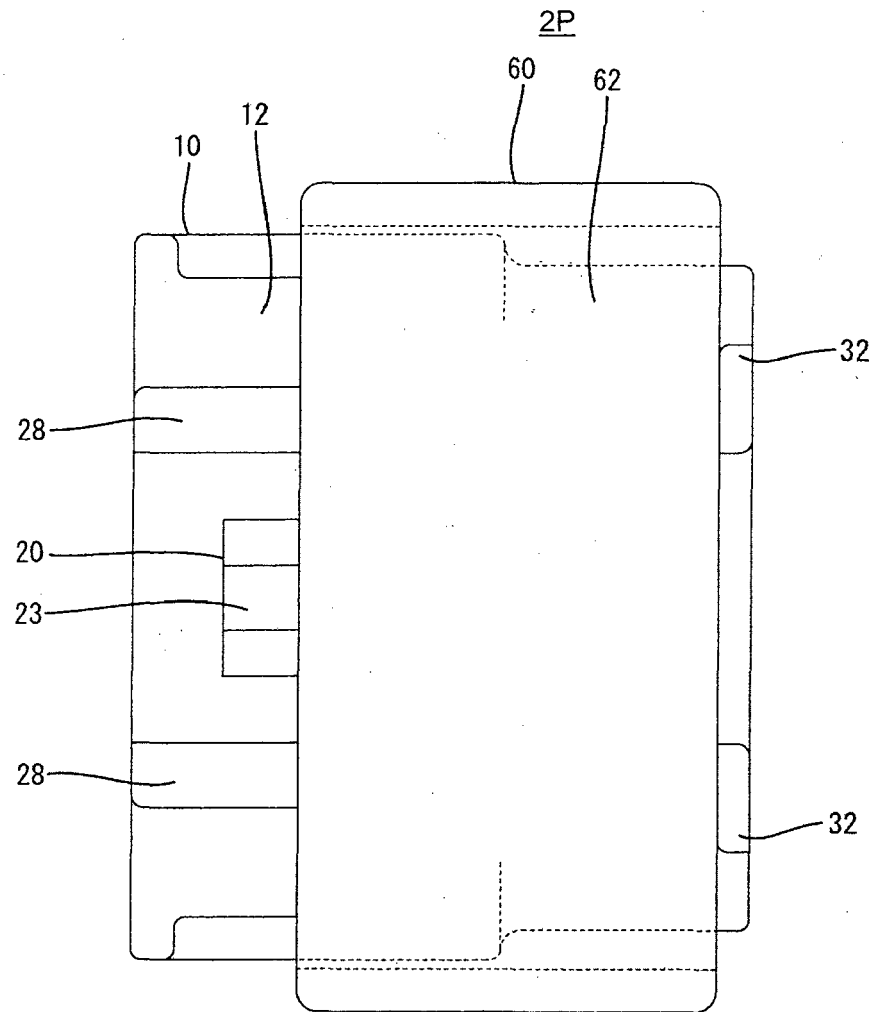


FIG. 9

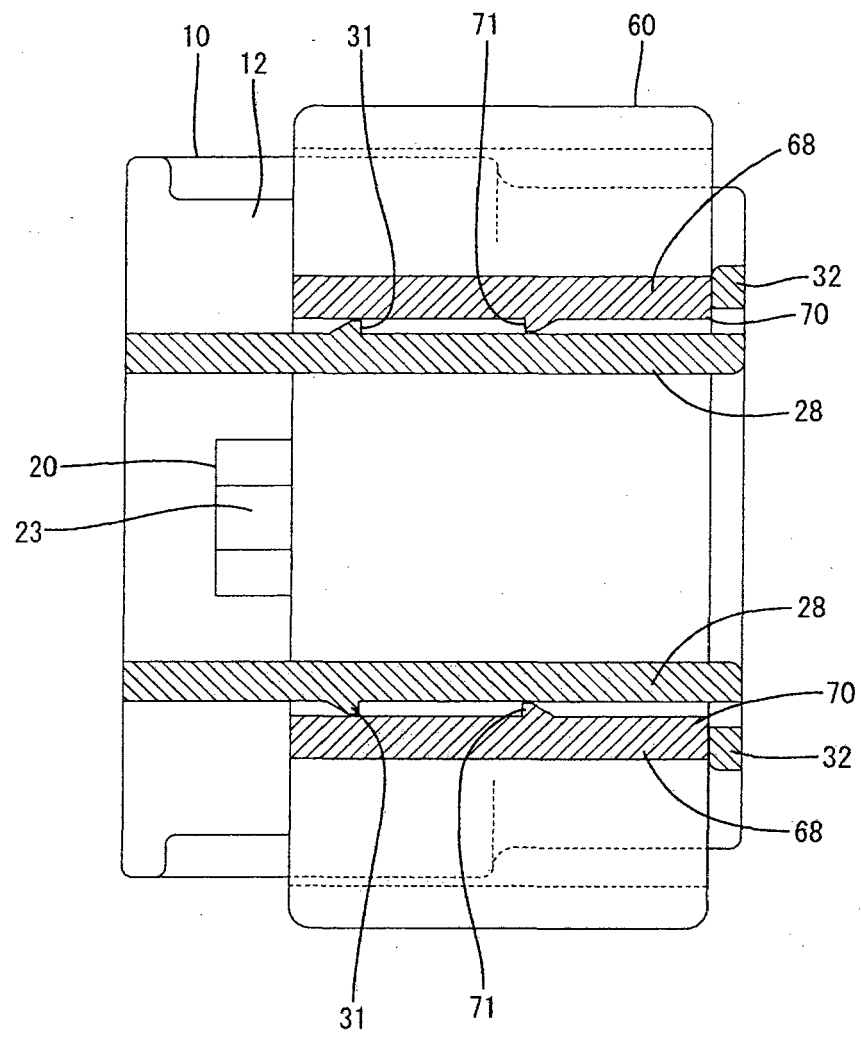
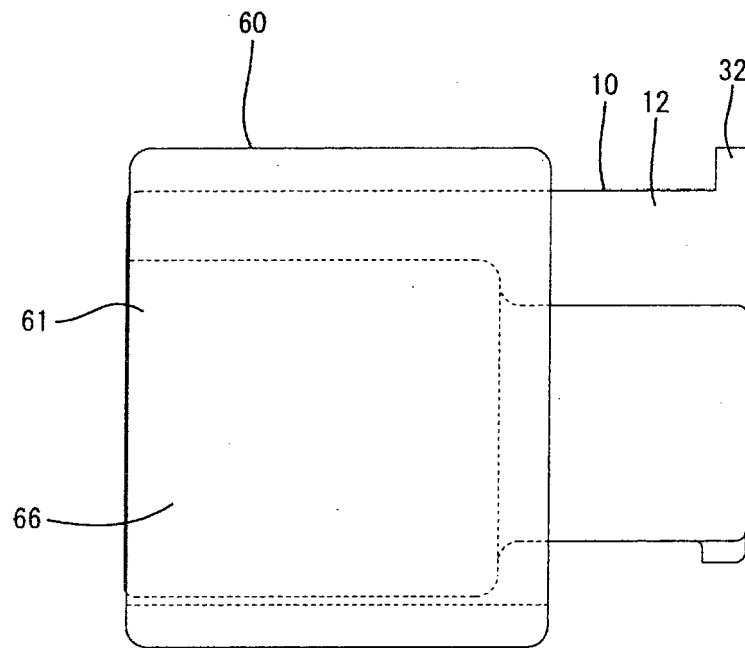


FIG. 10





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Place of search The Hague		Date of completion of the search 10 January 2017	Examiner Vautrin, Florent
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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