(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
3 June 2010 (03.06.2010)

PCT

(10) International Publication Number
WO 2010/063020 A2

(51) International Patent Classification:
H01R 4/60 (2006.01)

(21) International Application Number:
PCT/US2009/066047

(22) International Filing Date:
30 November 2009 (30.11.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2008-304106 28 November 2008 (28.11.2008) JP

(71) Applicant *(for all designated States except US)*: **MOLEX INCORPORATED** [US/US]; 2222 Wellington Court, Lisle, Illinois 60532-1682 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **ITO, Naotoshi** [JP/JP]; 33, Akagi-shitamachi, Shinjuku-ku, Tokyo, Tokyo 162-0803 (JP). **ASAKAWA, Kazushige** [JP/JP]; 3-1-11 Nakazawa, Asahi-ku, Yokohama-shi, Kanagawa 241-0814 (JP).

(74) Agents: **MORELLA, Timothy** et al.; Molex Incorporated, 2222 Wellington Court, Lisle, Illinois 60532-1682 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

[Continued on next page]

(54) Title: CONNECTOR FOR GAME MACHINES

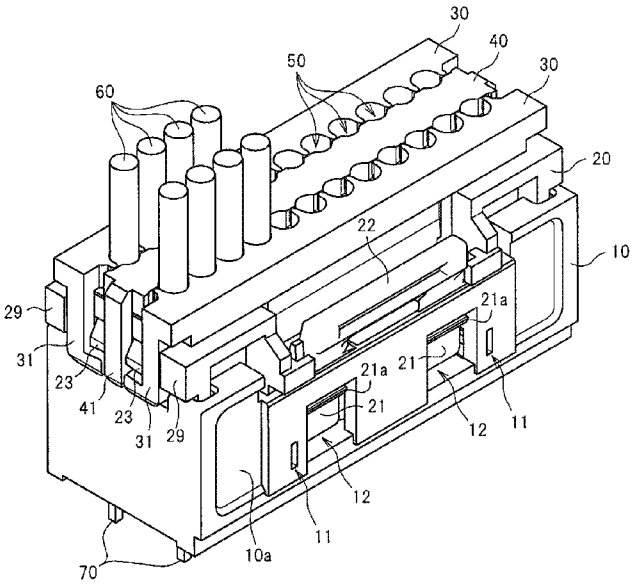


FIG. 1

(57) Abstract: A connector for a game machine is disclosed. The connector includes a female connector and a male connector. The female connector includes a concave portion having one or more female side terminals disposed therein. The male connector is housed in the concave portion of the female connector, has male side terminals housed in the concave portion, corresponding to the female side terminals and connected to the female side terminals provided. A deformable engaging piece is provided on one of the inner surface of the surrounding wall and the side surface of the male connector. A fixed engaging piece is provided on the other of the inner surface of the surrounding wall and the side surface of the male connector. The surrounding wall has a confirmation hole formed therein for confirming the claw of the deformable engaging piece.

WO 2010/063020 A2

— *as to the identity of the inventor (Rule 4.17(i))*

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

— *of inventorship (Rule 4.17(iv))*

Published:

— *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

CONNECTOR FOR GAME MACHINES

REFERENCE TO RELATED APPLICATIONS

[0001] The Present Invention claims priority of prior Japanese Patent Application No. 2008-304106, entitled "Connector For Game Machines," and filed 28 November 2008, the contents of which is fully incorporated in its entirety herein.

BACKGROUND OF THE PRESENT INVENTION

[0002] The present invention relates to a connector for a game machine, and more particularly, to a connector for a game machine for connecting electric wires used in a game machine such as a pachinko machine or a slot machine.

[0003] In a game machine such as a pachinko machine or a slot machine, a control board for controlling operation of the game machine is provided inside thereof. The control board is electrically connected to equipment to be controlled of various kinds such as a winning device. In order to implement the connection, an electric wire connector for the game machine is provided at an end of an electric wire extending from the equipment to be controlled, and the connector is attached to the control board (*see, e.g.*, Fig. 3 in Japanese Patent Application No. 2007-267895).

SUMMARY OF THE PRESENT INVENTION

[0004] By the way, a game machine such as a pachinko machine or a slot machine is vulnerable to a dishonest act from the outside which intentionally makes a winning device malfunction. Each portion of the game machine is required to have measures to prevent such dishonesty. It is preferable that, when a connector for a game machine is dishonestly detached from the control board, and after that, the connector for a game machine is again placed into position and connected to the control board, an evidence that the connector was once detached such as a breakage of a part of the connector for a game machine can be confirmed without detaching the connector for a game machine from the control board. Then, the dishonest act can be confirmed after the fact and the dishonesty can be condemned.

[0005] The present invention is made in view of the above-mentioned problem, and an object of the present invention is to provide a connector for a game machine which, when the connector is

detached, leaves an evidence thereof and which enables confirmation of the evidence without detaching the connector.

[0006] In order to solve the above-mentioned problem, a connector for a game machine of the present invention includes: a female connector including a concave portion having one or more female side terminals disposed therein; and a male connector housed in the concave portion of the female connector, having male side terminal(s) housed in the concave portion of the female connector corresponding to the female side terminal(s), and connected to the female side terminal(s) provided, in which a deformable engaging piece which is supported in a cantilever-like manner, extends between an inner surface of a surrounding wall defining the concave portion of the female connector and a side surface of the male connector and is elastically deformable is provided on one of the inner surface of the surrounding wall and the side surface of the male connector, a fixed engaging piece for engaging with a claw located at a tip of the deformable engaging piece is provided on the other of the inner surface of the surrounding wall and the side surface of the male connector, and the surrounding wall has a confirmation hole formed therein for confirming the claw of the deformable engaging piece.

[0007] Further, the deformable engaging piece may be provided so that a part thereof is broken by disengaging the male connector from the female connector. Further, the confirmation hole may be located sideways of the claw at a portion which is nearer to a base than a tip of the claw.

BRIEF DESCRIPTION OF THE FIGURES

[0008] The organization and manner of the structure and operation of the Present Invention, together with further objects and advantages thereof, may best be understood by reference to the following Detailed Description, taken in connection with the accompanying Figures, wherein like reference numerals identify like elements, and in which:

[0009] Fig. 1 is a perspective view illustrating a connector for a game machine according to Embodiment 1 of the present invention;

[0010] Fig. 2 is a perspective view illustrating a male connector;

[0011] Fig. 3 is a perspective view illustrating a female connector;

[0012] Fig. 4 is a perspective view illustrating a side cover member;

[0013] Fig. 5 is a perspective view illustrating an intermediate cover member;

[0014] Fig. 6 is a plan view illustrating the connector for a game machine according to Embodiment 1 of the present invention;

[0015] Fig. 7 is a sectional view taken along the line VII-VII of Fig. 6;

[0016] Fig. 8 is a sectional view taken along the line VIII-VIII of Fig. 6;

[0017] Fig. 9 is a sectional view taken along the line IX-IX of Fig. 6;

[0018] Fig. 10 is a sectional view taken along the line X-X of Fig. 6; and

[0019] Fig. 11 is a partially enlarged front view of the connector for a game machine illustrating a confirmation hole.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0020] While the Present Invention may be susceptible to embodiment in different forms, there is shown in the Figures, and will be described herein in detail, specific embodiments, with the understanding that the disclosure is to be considered an exemplification of the principles of the Present Invention, and is not intended to limit the Present Invention to that as illustrated.

[0021] In the embodiments illustrated in the Figures, representations of directions such as up, down, left, right, front, rear and the like, used for explaining the structure and movement of the various elements of the Present Invention, are not absolute, but relative. These representations are appropriate when the elements are in the position shown in the Figures. If the description of the position of the elements changes, however, it is assumed that these representations are to be changed accordingly.

[0022] An embodiment of the present invention is described in detail in the following on the basis of the drawings. Fig. 1 is a perspective view illustrating a connector for a game machine according to an embodiment of the present invention. Fig. 2 is a single member perspective view illustrating a male connector. Fig. 3 is a single member perspective view illustrating a female connector. Further, Fig. 4 is a single member perspective view illustrating a side cover member alone attached to an upper surface of the male connector. Fig. 5 is a single member perspective view illustrating an intermediate cover member similarly attached to the upper surface of the male connector. Fig. 6 is a plan view illustrating the connector for a game machine according to the embodiment of the present invention. Fig. 7 is a sectional view taken along the line VII-VII. Fig. 8 is a sectional view taken along the line VIII-VIII. Fig. 9 is a sectional view taken along

the line IX-IX. Fig. 10 is a sectional view taken along the line X-X. Further, Fig. 11 is an enlarged front view of a confirmation hole provided in a front surface of the female connector.

[0023] As illustrated in Fig. 1, the connector for a game machine according to this embodiment includes a female connector 10, made of a resin and substantially formed in the shape of a box opening upward, and a male connector 20, made of a resin and housed in a concave portion of the female connector 10. A side cover member 30, an intermediate cover member 40, and another side cover member 30 extending from side to side are attached to an upper surface of the male connector 20 so as to be arranged in this order from a front surface side to a rear surface side. The upper surface of the male connector 20 is covered with the above-mentioned three members. Both side cover members 30 and the intermediate cover member 40 are formed of a resin. Twelve electric wire holes 50 are arranged in a line at junctures between the intermediate cover member 40 and one of the side cover members 30 and between the intermediate cover member 40 and the other side cover members 30. Electric wires 60 for connecting equipment to be controlled such as a winning device provided in the game machine and a control board extend through the electric wire holes 50 into the male connector 20. The electric wires 60 are surrounded by the intermediate cover member 40 and any of the side cover members 30.

[0024] As illustrated in Fig. 2, twenty four electric wire insert holes 24 are formed in the upper surface of the male connector 20 such that twenty four (only eight are illustrated in the figure) electric wires 60 are inserted therein. Twelve of the electric wire insert holes 24 are provided in a line from side to side at a location a little forward in the upper surface of the male connector 20 and the remaining twelve of the electric wire insert holes 24 are provided in a line from side to side at a location a little backward. It is to be noted that the electric wire insert holes 24 in the respective lines which correspond to each other are arranged so as to be in a front-to-back relationship. The electric wires 60 are inserted in the electric wire insert holes 24, respectively, such that the two, i.e., the front and back electric wire lines are provided so as to be in parallel with each other. As illustrated in Fig. 1, a region of the upper surface of the male connector 20 sandwiched between the two electric wire lines is covered with the intermediate cover member 40, while a region on a front surface side of the electric wire line on the front surface side is covered with one of the side cover members 30. Similarly, a region on a rear surface side of the electric wire line on the rear surface side is covered with the other of the side cover members 30.

This makes gaps between the electric wires 60 and the electric wire insert holes 24 filled with the side cover members 30 and the intermediate cover member 40.

[0025] A pair of engaging pieces 21 supported in a cantilever-like manner by a lower portion of the front surface 20b of the male connector 20 and extending upward therefrom is formed on the side of the front surface 20b. Upper ends of the engaging pieces 21 are coupled to both ends of a grip 22 extending from side to side. The engaging pieces 21 and 21 are adapted to be, when the grip 22 is held, elastically deformed toward a rear surface side of the male connector 20.

[0026] Further, relatively thin rod-like deformable engaging pieces 28 are disposed beside the engaging pieces 21, respectively. Specifically, support portions 27 protruding forward are formed beside the engaging pieces 21, respectively, on the front surface 20b of the male connector 20, and the deformable engaging pieces 28 extend downward from lower surfaces of the support portions 27 at locations away from the front surface 20b of the male connector 20, respectively. Specifically, the deformable engaging pieces 28 are supported in a cantilever-like manner by the support portions 27 disposed thereabove, and elastically deformable from side to side along the front surface 20b.

[0027] As illustrated in Fig. 3, the female connector 10 includes a concave portion 10c for housing the male connector 20, and twenty four rod-like board connection terminals 70 made of metal are provided in total in a standing condition on a bottom wall 10b so as to correspond to the respective electric wires 60. Lower ends of the board connection terminals 70 pierce the bottom wall 10b and are located on a rear surface side of the bottom wall 10b, that is, a rear side of the female connector 10 to be inserted in holes (not shown) in a control board. As a result, lower ends of the board connection terminals 70 are adapted to be electrically connected by soldering to the control board.

[0028] A surrounding wall 10a is provided in a standing condition around the bottom wall 10b, and concave portions 15 and 15 are formed at upper edges of right and left side walls forming the surrounding wall 10a. Guide grooves 14 extending vertically are formed at right and left ends of an inner surface of a front wall forming the surrounding wall 10a. Guide walls 20a and 20a provided in a standing condition so as to vertically extend at both ends of the front surface of the male connector 20 fit in the guide grooves 14 and 14, respectively.

[0029] The front wall forming the surrounding wall 10a of the female connector 10 further has engaging holes 12 and 12 formed therein which are provided side by side. When the male

connector 20 is inserted in the female connector 10, engaging claws 21a and 21a formed on front surfaces of the engaging pieces 21 and 21 of the male connector 20 are engaged with upper edges of the engaging holes 12 and 12 of the female connector 10 such that, unless the grip 22 is held, the male connector 20 is not disengaged (pulled out) from the female connector 10.

[0030] A confirmation hole 11 smaller than the engaging holes 12 is formed beside each of the engaging holes 12. As illustrated in Fig. 3, Fig. 9, and Fig. 11, a fixed engaging piece 13 formed in the shape of a wall extending vertically so as not be in contact with the bottom wall 10b is provided on the inner surface of the surrounding wall 10a at a location between the confirmation hole 11 and the engaging hole 12. When the male connector 20 is housed in the concave portion 10c, engaging claws 28a extending toward a center side in a lateral direction of the male connector 20 at tips of the deformable engaging pieces 28 are adapted to be engaged with lower edges of the fixed engaging pieces 13.

[0031] As illustrated in Fig. 11, the existence of the engaging claws 28a can be confirmed through the confirmation holes 11. As illustrated in the figure, a midway portion of the engaging claw 28a, that is, a portion of the engaging claw 28a which is nearer to a base than the tip is located in front of (beyond) the confirmation hole 11, that is, in a direction of providing the confirmation hole 11, and the tip of the engaging claw 28a can not be seen through the confirmation hole 11. This makes it difficult to insert a needle or the like through the confirmation hole 11 to release the engagement between the engaging claw 28a and the fixed engaging piece 13. Further, as illustrated in Fig. 9 to Fig. 10, the engaging claws 28a extend in the lateral direction along the front surface 20b of the male connector 20, and a gap between the engaging claw 28a and the front surface 20b of the male connector 20 and a gap between the engaging claw 28a and the inner surface of the surrounding wall 10a are smaller than the width of the engaging claw 28a. Therefore, even when a needle or a like is inserted from the confirmation hole 11 and the engaging claw 28a is pressed toward the rear surface side of the male connector 20, the engagement with the fixed engaging piece 13 can not be released.

[0032] The engaging claws 28a are formed to be relatively fragile, and means like the grip 22 for releasing from the outside the engagement with the fixed engaging pieces 13 is not provided. Therefore, once the male connector 20 is inserted in the female connector 10 and the engaging claws 28a are engaged with the fixed engaging pieces 13, when the grip 22 is held again and the male connector 20 is disengaged from the female connector 10, the engaging claws 28a are

broken or come off from the tips of the deformable engaging pieces 28. In the connector for a game machine according to the present embodiment, the existence of the engaging claws 28a can be confirmed through the confirmation holes 11, and hence it can be determined that a person who has committed a dishonest act dishonestly has inserted or extracted the male connector 20 without pulling out the male connector 20 from the female connector 10 once again. It is to be noted that, when a game machine is manufactured, by providing in inspection equipment a female connector for inspection which is configured similarly to the female connector 10 illustrated in Fig. 3 except that the fixed engaging pieces 13 are not provided therein, the inspection can be conducted without damaging the engaging claws 28a.

[0033] Next, as illustrated in Fig. 4, the side cover member 30 includes a horizontally long square rod-like base portion 30a. Engaging pieces 31 extend downward from both ends of the base portion 30a. The engaging pieces 31 are supported in a cantilever-like manner by the both ends of the base portion 30a and are elastically deformable. Engaging claws 31a extending in a width direction of the base portion 30a are provided at tips of the engaging pieces 31, and the engaging pieces 31 are formed to be L-shaped in general. When the side cover member 30 is attached to the male connector 20, the engaging claws 31a are adapted to be engaged with protrusions 23 provided on side surfaces of the male connector 20. It is noted that upper surfaces of the protrusions 23 are slanted, and, when the side cover member 30 is attached, the engaging claws 31a ride on the protrusions 23, which makes the engaging pieces 31 gradually elastically deformed, and after that, the engaging claws 31a fit in portions below the protrusions 23.

[0034] Twelve thin plate-like claws 33 extend from a lower surface of the base portion 30a of the side cover member 30. Those claws 33 fit in the electric wire insert holes 24 beside the electric wires 60 to fill space outside the electric wires 60 (on the front surface side and on the rear surface side) with the claws 33. This can prevent dishonest insertion of metal such as a wire beside the electric wires 60. As illustrated in Fig. 8, bullet terminals 61 for implementing reliable electric connection with the board connection terminals 70 are attached to tips of the electric wires 60, respectively, and tips of the claws 33 are in contact with upper edges of the bullet terminals 61. Specifically, the claws 33 act as retainers of the electric wires 60 and make the electric wires 60 resistant to being pulled out. It is to be noted that the claws 33 are not necessarily required to be in contact with the upper edges of the bullet terminals 61. Of course,

even if the claws 33 are not long enough to be in contact with the upper edges of the bullet terminals 61, dishonest insertion of metal beside the electric wires 60 can be prevented.

[0035] Further, twelve concave surfaces 32 in the shape of semicylinder surfaces are formed on one side surface of the base portion 30a so as to conform to the side surfaces of the twelve electric wires 60 arranged in a line. Therefore, when the side cover member 30 is attached to the male connector 20, the front surface side or the rear surface side of the electric wires 60 is covered with the base portion 30a.

[0036] As illustrated in Fig. 5, the intermediate cover member 40 also includes a horizontally long square rod-like base portion 40a. Engaging pieces 41 extend downward from both ends of the base portion 40a. The engaging pieces 41 are supported in a cantilever-like manner by the both ends of the base portion 40a and are elastically deformable. Engaging claws 41a extending inwardly at tips of the engaging pieces are adapted to be engaged with upper edges of grooves 26 formed on the side surfaces of the male connector 20. Twelve concave surfaces 42 in the shape of semicylinder surfaces are formed on one side surface of the base portion 40a so as to conform to the side surfaces of the twelve electric wires arranged in a line. Similarly, twelve concave surfaces 42 in the shape of semicylinder surfaces are formed on the opposite side surface. As described above, the twelve concave surfaces 32 are formed on the base portion 30a of the side cover member 30, and the concave surface 32 and the concave surface 42 face each other to form the electric wire hole 50. Therefore, when the intermediate cover member 40 is attached to the male connector 20, the rear surface side of the line of the electric wires 60 on the front surface side and the front surface side of the electric wires 60 on the rear surface side are fully covered with the both side surfaces of the base portion 40a.

[0037] Extended portions 40b protruding sideways into space between the electric wires 60 are formed on lower sides of junctures of the concave surfaces 42 of the intermediate cover member 40, respectively. Specifically, as illustrated in Fig. 7, the base portion 40a is inverted T-shaped in section between the electric wires 60 adjacent in a lateral direction. Further, as illustrated in the figure, extended portions 30b protruding sideways into space between the electric wires 60 are formed on upper sides of junctures of the concave surfaces of the side cover members 30, respectively. The extended portions 30b are above the extended portion 40b, which makes it difficult to disengage the intermediate cover member 40 from the male connector 20 unless the side cover members 30 and 30 are detached from the male connector 20.

[0038] As illustrated in Fig. 1, in a state in which the intermediate cover member 40 and the side cover members 30 are attached to the male connector 20, the engaging piece 41 of the intermediate cover member 40 extends between the protrusions 23 and 23 formed on the side surface of the male connector 20, and the tip thereof is surrounded by the concave portion 15 formed at the upper edge of the surrounding wall 10a of the female connector 10 and the engaging pieces 31 and 31 of the side cover members 30 and 30. Further, the engaging piece 31 extends between the protrusion 23 and an overhanging portion 29 formed on the side surface of the male connector 20, and the tip thereof is surrounded by the concave portion 15 and the engaging piece 41 of the intermediate cover member 40. In this way, it is made difficult to release the engagement between the engaging pieces 31 and 41 to detach the side cover members 30 or the intermediate cover member 40 from the male connector 20.

[0039] According to the connector for a game machine described above, the peripheries of the electric wires 60 are surrounded by the intermediate cover member 40 and the side cover members 30 and 30. Here, the claws 33 of the side cover members 30 fit in the electric wire insert holes 24, and hence it is difficult to deform the side cover members 30. In this way, the peripheries of the electric wires 60 are covered with reliability and lateral insertion of metal such as a probe into the electric wire insert holes 24 is prevented.

[0040] Further, the deformable engaging piece 28 and the fixed engaging pieces 13 are provided in the gap between the male connector 20 and the female connector 10, and hence when the male connector 20 is attached to the female connector 10, the two are adapted to be engaged with each other and the engaging claws 28a at the tips of the deformable engaging pieces 28 can be seen through the confirmation holes 11 provided in the surrounding wall 10a. Thus, dishonest insertion and extraction of the male connector 20 can be confirmed without pulling out the male connector 20. It is to be noted that, though, in the above-mentioned embodiment, the deformable engaging pieces 28 are provided on the male connector 20 and the fixed engaging pieces 13 are provided on the female connector 10, it goes without saying that an opposite case is possible, that is, the fixed engaging pieces 13 may be provided on the male connector 20 and the deformable engaging pieces 28 may be provided on the female connector 10.

[0041] While a preferred embodiment of the Present Invention is shown and described, it is envisioned that those skilled in the art may devise various modifications without departing from the spirit and scope of the foregoing Description and the appended Claims.

CLAIMS

WHAT IS CLAIMED IS:

1. A connector for a game machine comprising:

a female connector (10) including a concave portion (10c) having one or more female side terminals (70) disposed therein; and

a male connector (20) housed in the concave portion (10c) of the female connector (10), having male side terminal(s) (61) housed in the concave portion (10c) of the female connector (10) corresponding to the female side terminal(s) (70) and connected to the female side terminal(s) (70) provided;

wherein a deformable engaging piece (28) which is supported in a cantilever-like manner, extends between an inner surface of a surrounding wall (10a) defining the concave portion (10c) of the female connector (10) and a side surface of the male connector (20) and is elastically deformable is provided on one of the inner surface of the surrounding wall (10a) and the side surface of the male connector (20), a fixed engaging piece (13) for engaging with a claw (28a) located at a tip of the deformable engaging piece is provided on the other of the inner surface of the surrounding wall (10a) and the side surface of the male connector (20), and the surrounding wall (10a) has a confirmation hole (11) formed therein for confirming the claw (28a) of the deformable engaging piece (28).

2. The connector for a game machine according to Claim 1, wherein the deformable engaging piece (28) is provided so that at least a part (28a) thereof is broken by disengaging the male connector (20) from the female connector (10).

3. The connector for a game machine according to Claim 2, wherein the confirmation hole (11) is located sideways of the claw (28a) at a portion which is nearer to a base than a tip of the claw.

4. The connector for a game machine according to Claim 1, wherein the confirmation hole (11) is located sideways of the claw (28a) at a portion which is nearer to a base than a tip of the claw.

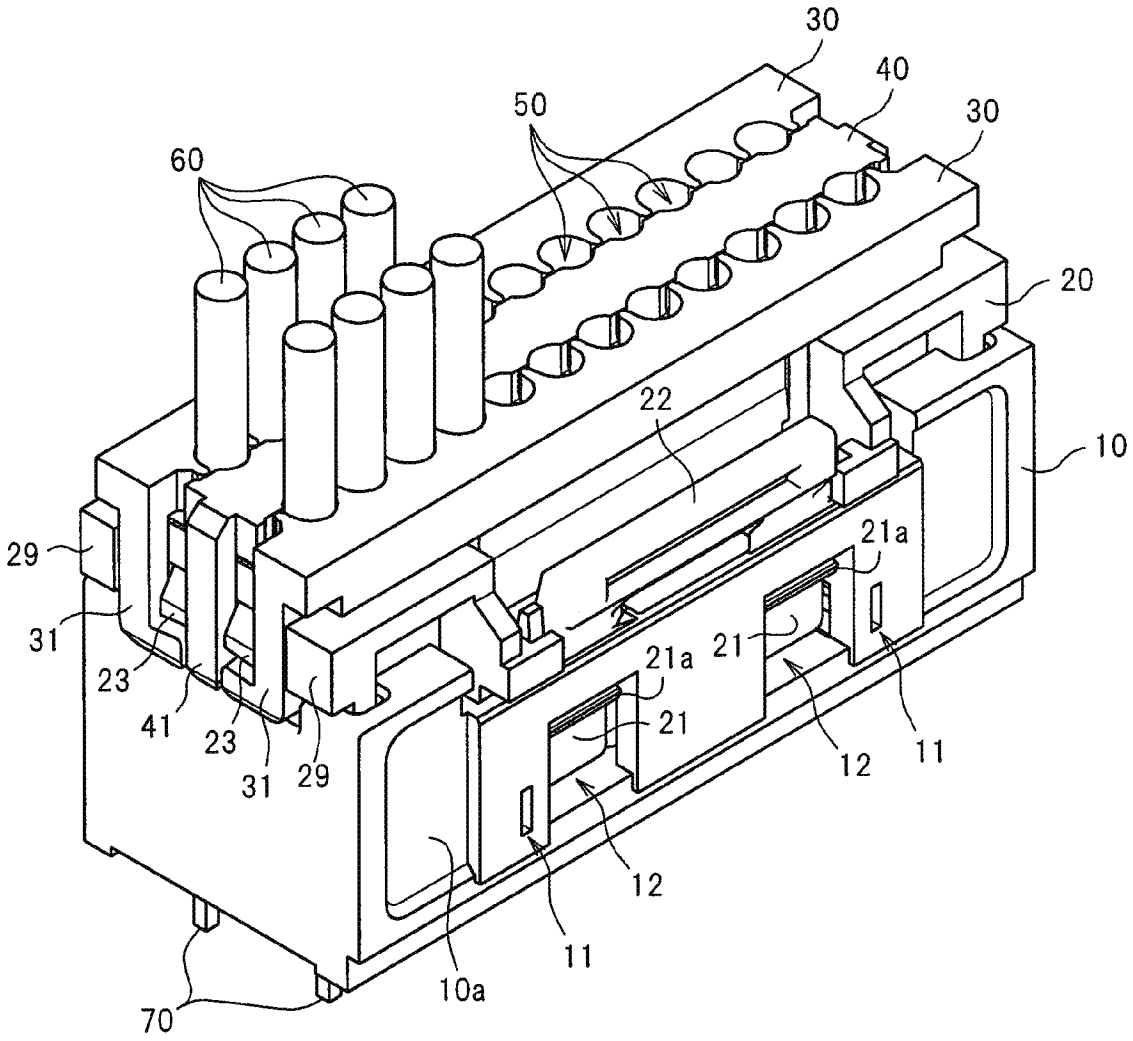

30
40
50
30
60
20
22
10
29
21a
31
21a
21
23
41
23
21
31
29
12
11
12
11
10a
70

FIG. 1

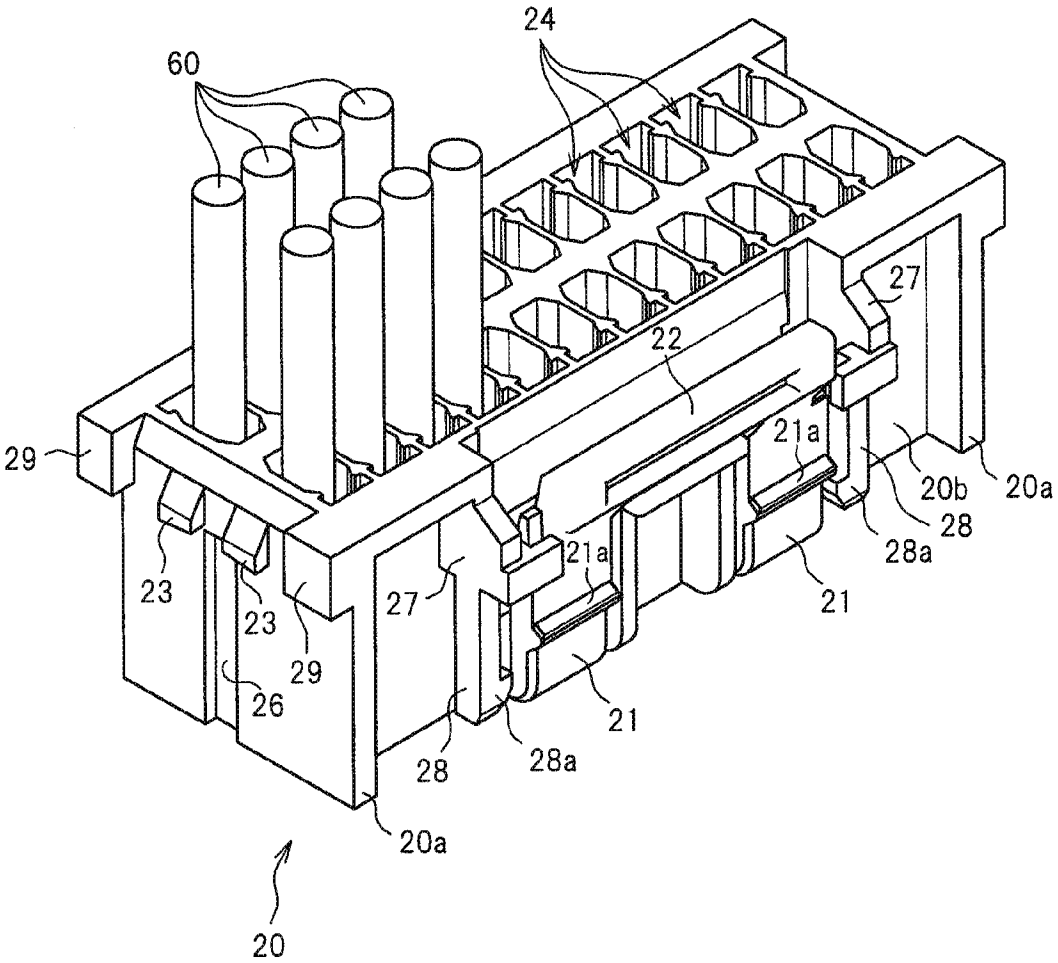

24
60
27
22
21a
29
20b
20a
28
28a
21a
23
27
21
23
29
26
21
28
28a
20a
20

FIG. 2

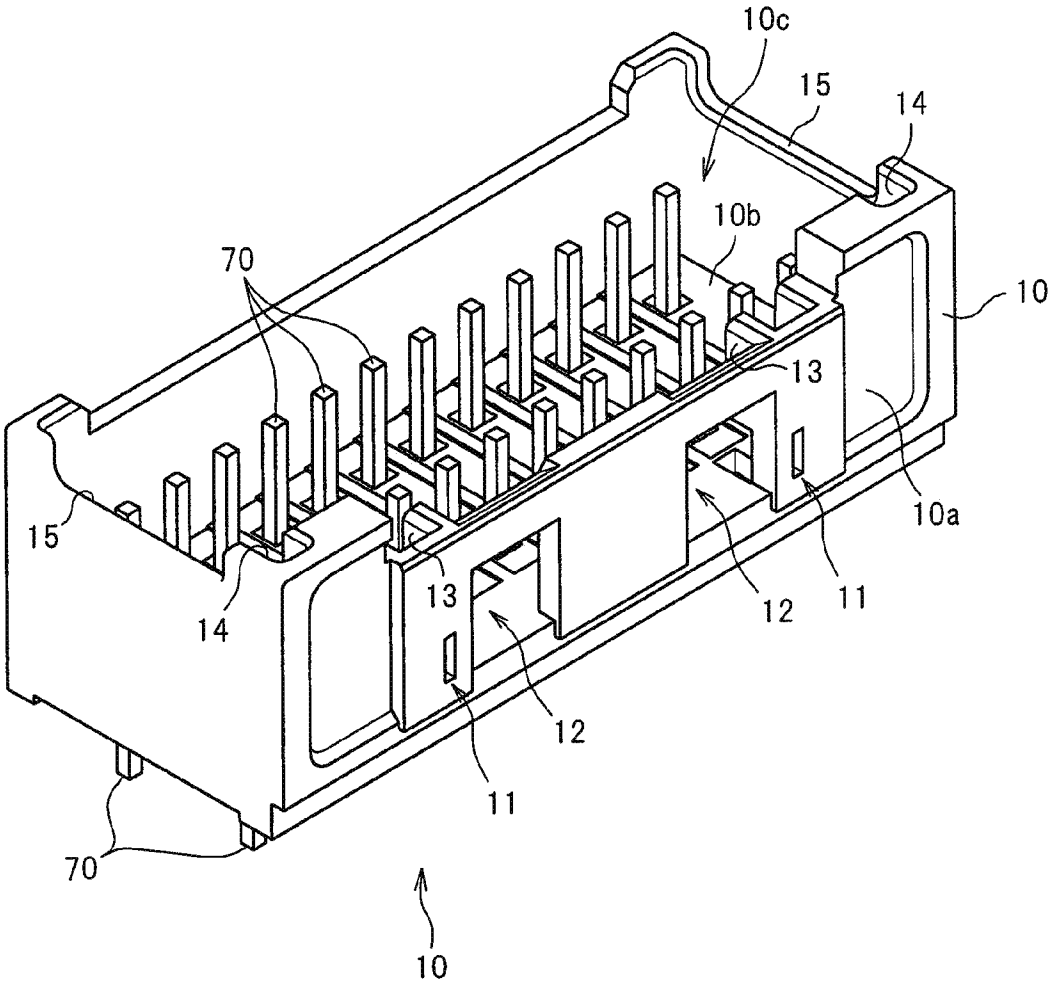


FIG. 3

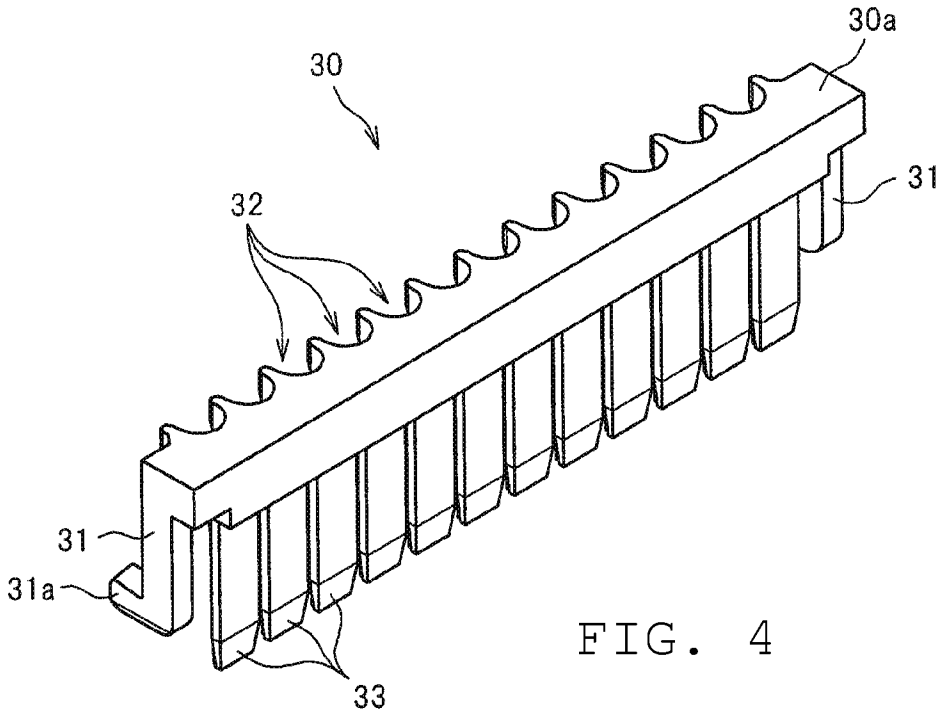


FIG. 4

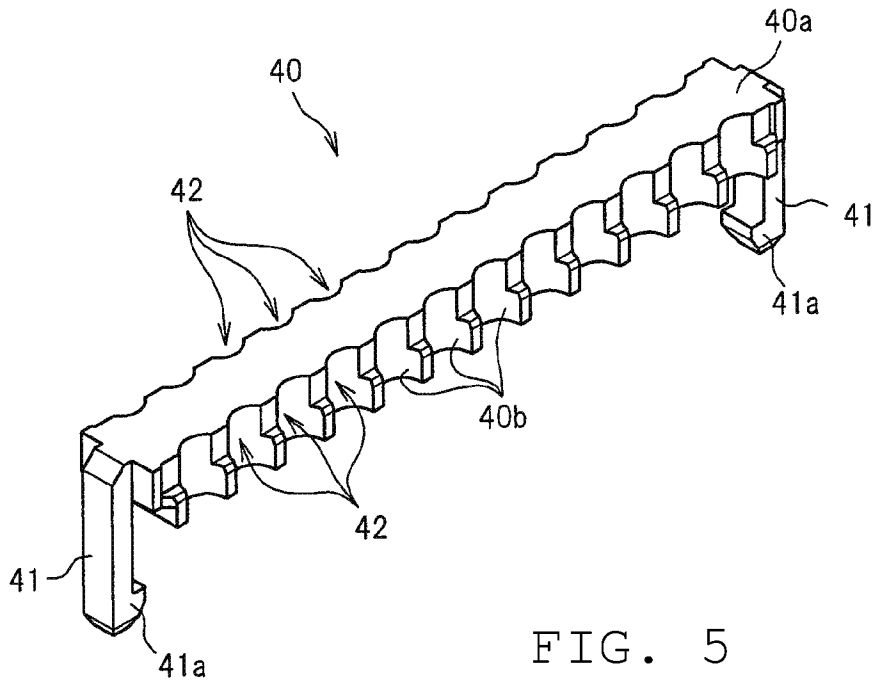


FIG. 5

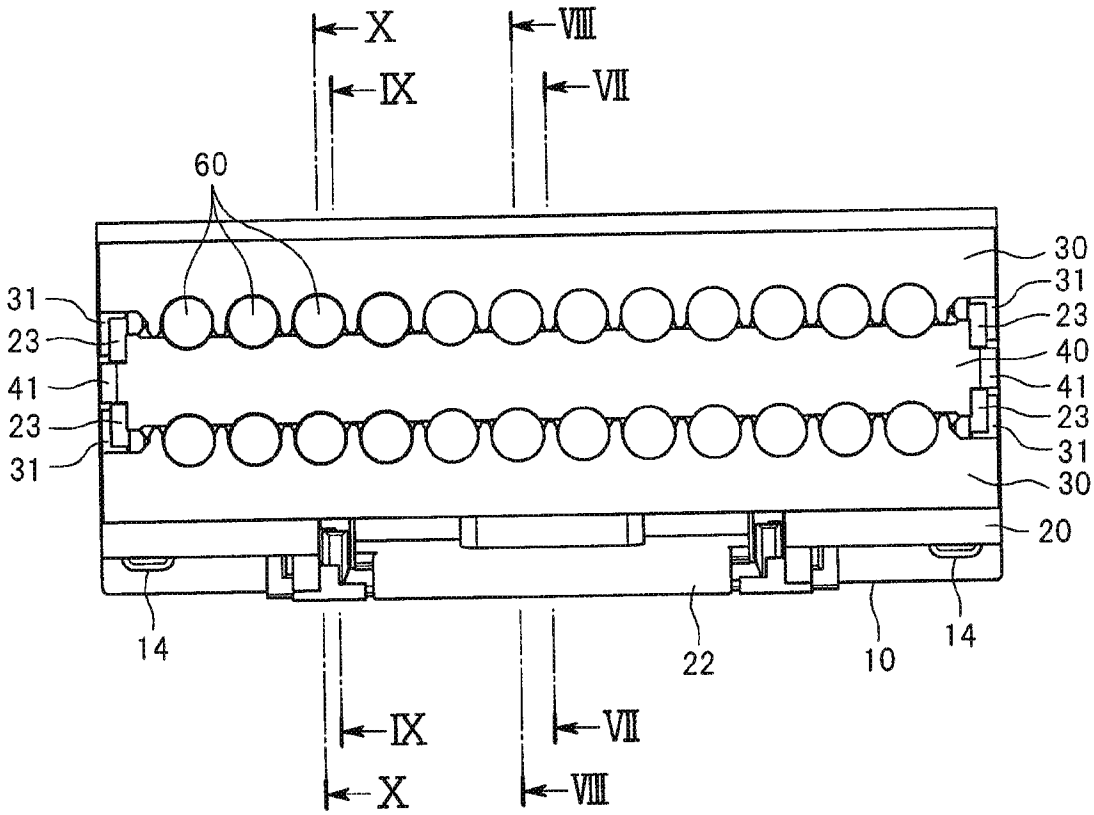

X
IX
VIII
VII
60
31
23
41
23
31
30
31
23
40
41
23
31
30
20
14
22
10
14
IX
X
VII
VIII

FIG. 6

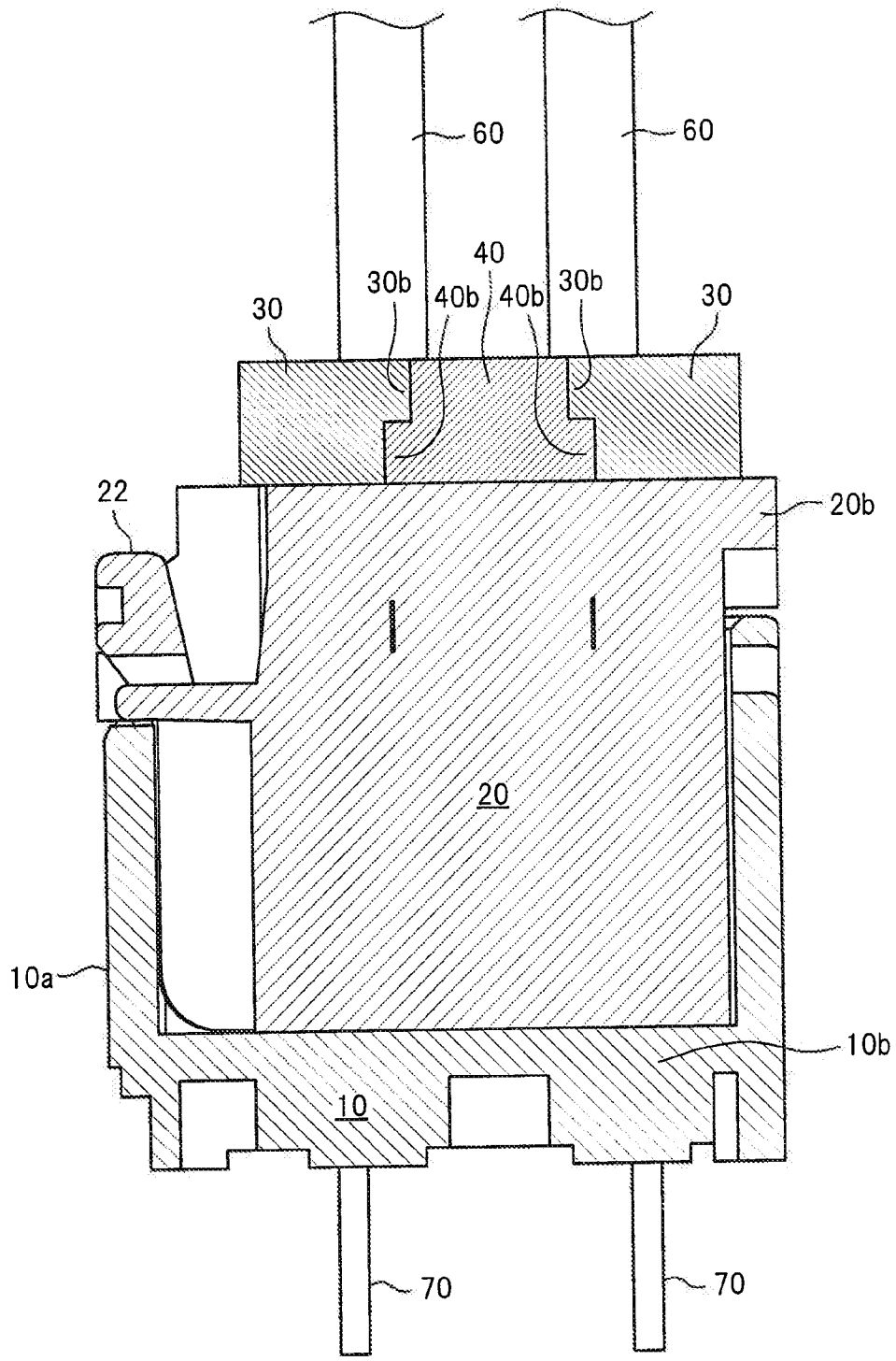


FIG. 7

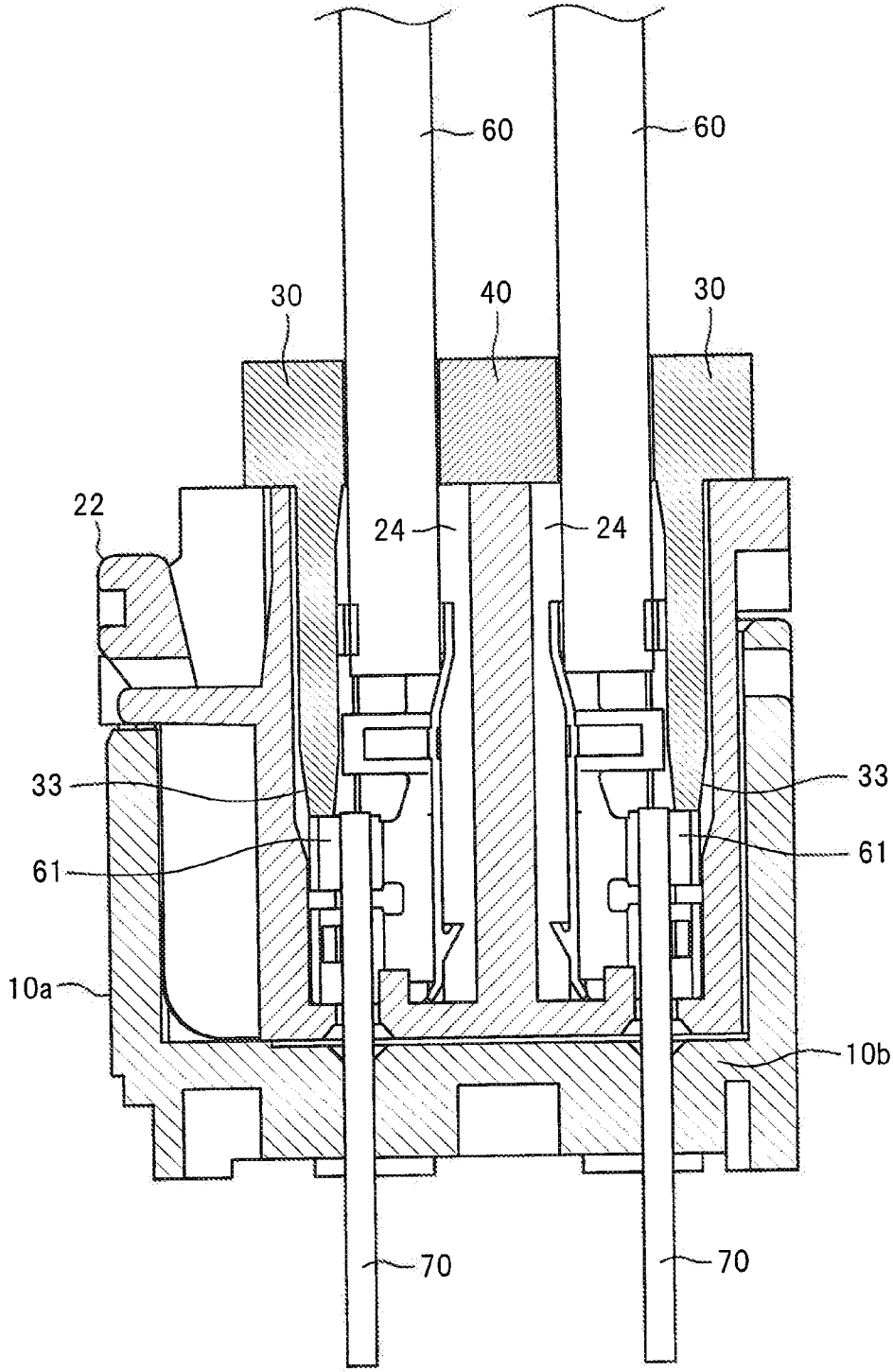


FIG. 8

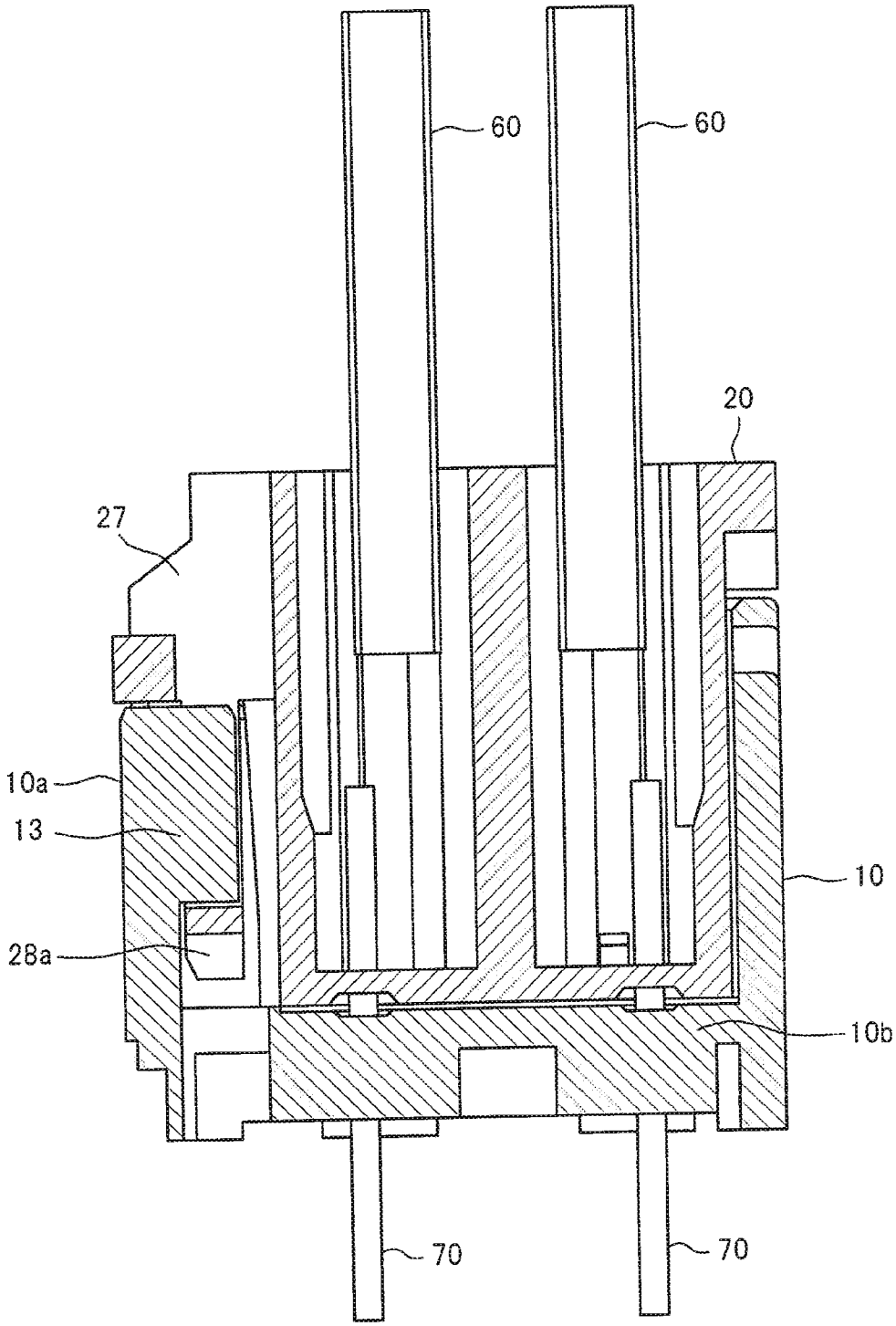


FIG. 9

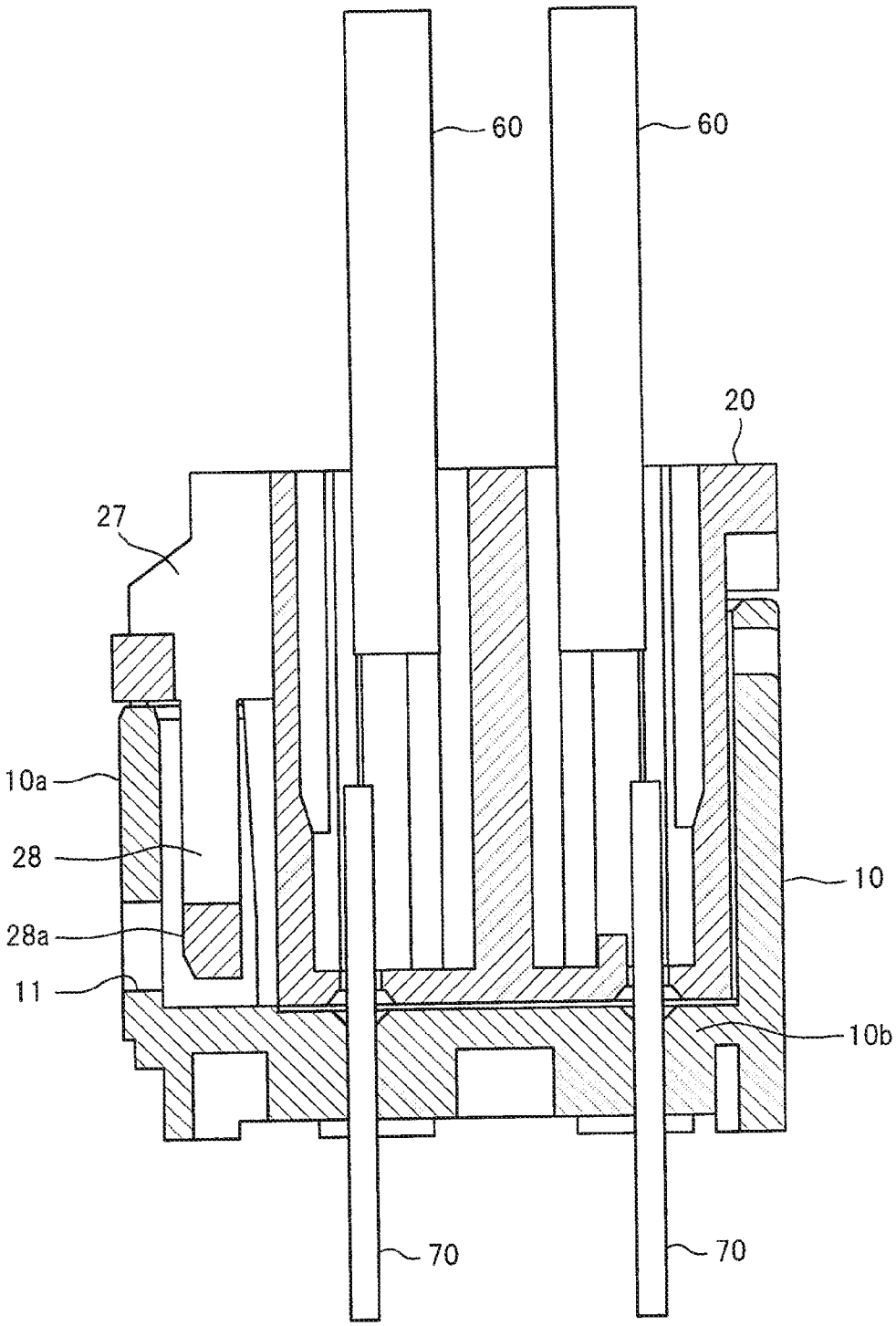


FIG. 10

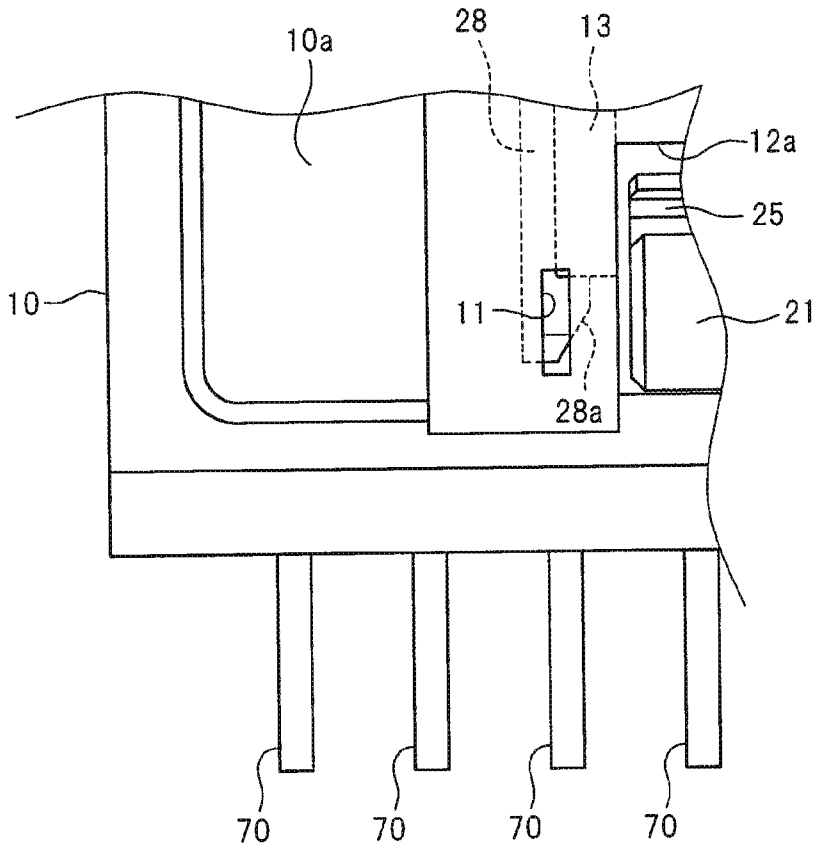


FIG. 11