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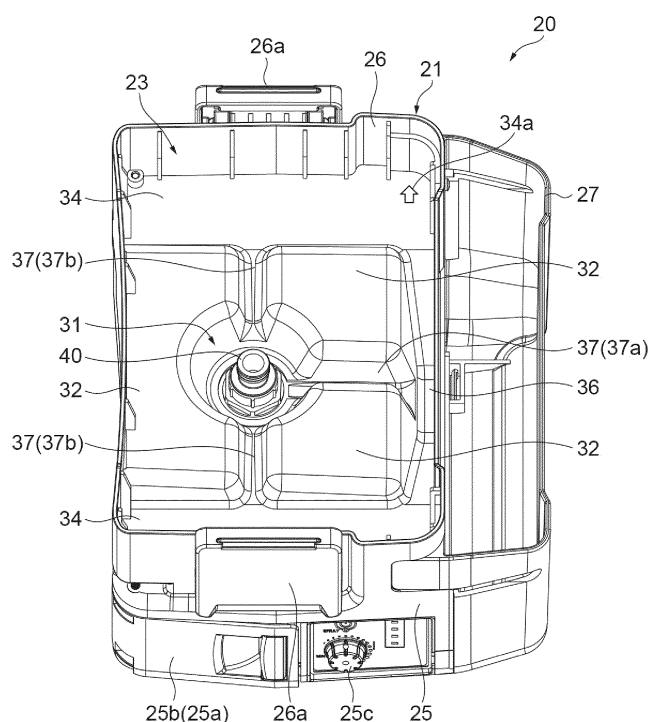
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(54) LIQUID DISCHARGE DEVICE

(57) There is provided a liquid discharge device that detachably holds a liquid tank 10 including a valve 14 in a bottom portion 12, the device including: a body case 21 that accommodates a power device. The body case 21 includes an upper wall 23 that faces the bottom portion 12 of the liquid tank 10 to support the liquid tank 10, and

a nozzle 40 that protrudes from the upper wall 23 to be connected to the valve 14. The upper wall 23 includes a recessed portion 31 that surrounds the nozzle 40, a groove 36 that is formed to be deeper than a depth of the recessed portion 31, and a flow path 37a that connects the recessed portion 31 and the groove 36.

Fig.3

Description

TECHNICAL FIELD

[0001] The present invention relates to a liquid discharge device.

BACKGROUND

[0002] In the related art, there is known a liquid discharge device including a pump that discharges a liquid. A liquid discharge device disclosed in Japanese Unexamined Patent Publication No. 2016-2537 includes a device body inside which a pump unit, a battery pack, and the like are provided, and a tank mounted in the device body. The device body includes a support wall that is continuous with a top plate, and the tank is placed in a region surrounded by the support wall. A nozzle is provided in the region surrounded by the support wall, and the nozzle opens a valve provided in a bottom surface of the tank, so that the valve of the chemical solution tank and the nozzle are connected to each other.

SUMMARY

[0003] In the liquid discharge device disclosed in Japanese Unexamined Patent Publication No. 2016-2537, a recessed portion is formed in the top plate to surround the nozzle of the device body. It is considered that, in the device body, a gap between the recessed portion and the nozzle is closed with a packing or the like. However, when the packing is damaged, or the like, it is considered that a liquid stored in the recessed portion surrounding the nozzle infiltrates into the device body from around the nozzle.

[0004] An object of the present invention is to provide a liquid discharge device that suppresses a liquid from infiltrating into a device body.

[0005] According to an aspect of the present invention, there is provided a liquid discharge device (1) that detachably holds a liquid tank (10) including a valve (14) in a bottom portion (12), the device including: a body case (21) that accommodates a power device. The body case (21) includes an upper wall (23) that faces the bottom portion (12) of the liquid tank (10) to support the liquid tank (10), and a nozzle (40) that protrudes from the upper wall (23) to be connected to the valve (14). The upper wall (23) includes a recessed portion (31) that surrounds the nozzle (40), a groove (36) that is formed to be deeper than a depth of the recessed portion (31), and a flow path (37a) that connects the recessed portion (31) and the groove (36).

[0006] In the liquid discharge device (1) described above, even when a liquid flows into the recessed portion (31) surrounding the nozzle (40), the liquid flows from the recessed portion (31) through the flow path (37a) to be stored in the groove (36). As described above, since the liquid is unlikely to be stored in the recessed portion

(31) surrounding the nozzle (40), the liquid is suppressed from infiltrating into the body case (21) from around the nozzle (40).

[0007] In one exemplary embodiment, the upper wall (23) may include a flat portion (32) surrounding the recessed portion (31), and the flat portion (32) may be inclined downward toward the groove (36). In this configuration, the liquid which has flowed into the upper wall (23) easily flows toward the groove (36) without passing through the recessed portion (31).

[0008] In one exemplary embodiment, the flow path (37a) may be inclined downward toward the groove (36). In this configuration, the liquid which has flowed into the recessed portion (31) easily flows toward the groove (36).

[0009] In one exemplary embodiment, an insertion portion (25a) through which a battery for operating the power device is inserted may be formed in a part of a peripheral wall (25) of the body case (21), and the upper wall (23) of the body case (21) may be provided with a mark (34a) by which a position of the insertion portion (25a) in the peripheral wall (25) is recognizable. In this configuration, a user can easily recognize the position of the insertion portion (25a) for the battery, and the liquid stored in the groove (36) of the upper wall (23) can be discharged from a position different from the position of the insertion portion (25a).

[0010] According to the present invention, it is possible to provide a liquid discharge device that suppresses a liquid from infiltrating into a device body.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011]

FIG. 1 is a front view illustrating a liquid discharge device according to one example.

FIG. 2 is a view illustrating a liquid tank.

FIG. 3 is a perspective view illustrating a device body.

FIG. 4 is a plan view illustrating the device body.

FIG. 5 is a cross-sectional view taken along line V-V of FIG. 4.

FIG. 6 is a cross-sectional view taken along line VI-VI of FIG. 4.

DETAILED DESCRIPTION

[0012] Hereinafter, one exemplary embodiment will be described with reference to the drawings. Incidentally, in the description of the drawings, the same components are denoted by the same reference signs, and duplicated descriptions will be omitted.

[0013] FIG. 1 is a front view illustrating a liquid discharge device according to one example. In FIG. 1, a high-pressure washer which discharges a liquid at high pressure is illustrated as an example of the liquid discharge device. It is assumed that a liquid discharge device 1 illustrated in FIG. 1 is used in a state where the liquid discharge device 1 is carried on the back by an

operator using a backpack band or the like, or in a state where the liquid discharge device 1 is carried on the shoulder by the operator using a shoulder belt or the like. Incidentally, the liquid discharge device 1 may be used in a state where the liquid discharge device 1 is placed on the ground or the like. In FIG. 1, a side surface of the liquid discharge device 1, which is a side close to the operator when the liquid discharge device 1 is carried on the back by the operator, is drawn as a front surface. In the following description, unless otherwise specified, a direction in which the front surface that is a front side of the liquid discharge device 1 and a rear surface opposite the front surface are connected to each other is defined as a forward and rearward direction, a horizontal direction orthogonal to the forward and rearward direction is defined as a rightward and leftward direction, and a direction orthogonal to the forward and rearward direction and the rightward and leftward direction is defined as an upward and downward direction. In addition, unless otherwise specified, the right and left of the liquid discharge device 1 is based on a state where the liquid discharge device 1 is viewed from the front. Namely, the right of the drawing sheet of FIG. 1 coincides with the right of the liquid discharge device 1.

[0014] The liquid discharge device 1 includes a liquid tank 10, and a device body 20 that detachably holds the liquid tank 10. The liquid tank 10 is a member that stores a liquid such as a chemical solution thereinside. An inlet port 11 through which the liquid is inlet into the liquid tank 10 is formed in an upper portion of the liquid tank 10. The inlet port 11 includes a cylindrical portion 11a having a cylindrical shape, and an upper lid 11b that is detachably mounted to an outer peripheral surface of the cylindrical portion 11a by, for example, a screw or the like. It is assumed that a grip portion 11c is formed in the upper lid 11b of the illustrated example, and is held for carriage by a user.

[0015] FIG. 2(a) is a rear view of the liquid tank 10 when viewed from a rear side, and FIG. 2(b) is a bottom view of the liquid tank 10. A pair of leg portions 13 are formed in a bottom portion 12 of the liquid tank 10. The leg portions 13 of one example protrude downward from both right and left ends of the bottom portion 12. The leg portion 13 is formed over substantially the entire region in the forward and rearward direction. The leg portion 13 of the illustrated example includes a protrusion portion 13a, which extends toward the other end in the rightward and leftward direction, at substantially the center in the forward and rearward direction.

[0016] In addition, a connection portion (valve) 14 is provided between the pair of leg portions 13 in the bottom portion 12 of the liquid tank 10. The connection portion 14 of one example has a bottomed cylindrical shape, and protrudes downward from the bottom portion 12. A valve 14a is provided at the center of a bottom surface of the connection portion 14. The valve 14a may be provided inside a recessed portion 14b formed in the bottom surface of the connection portion 14. For example, the valve

14a is opened to discharge the stored liquid when pressed from an outer side toward an inner side.

[0017] In addition, lock portions 16 are formed in the liquid tank 10 of the illustrated example. The lock portions 16 are provided in, for example, both side surfaces in the rightward and leftward direction, respectively. A pair of the lock portions 16 are portions that engage with a lock lever 26a of the device body 20 to be described later.

[0018] FIG. 3 is a perspective view of the device body when viewed from the upper right. FIG. 4 is a plan view of the device body. FIG. 5 is a cross-sectional view taken along line V-V of FIG. 4. FIG. 6 is a cross-sectional view taken along line VI-VI of FIG. 4. Incidentally, in FIGS. 5 and 6, only upper portion of the device body is illustrated.

The device body 20 includes a body case 21 that accommodates power devices including, for example, a pump, a motor, and the like. The body case 21 includes an upper wall 23 that faces the bottom portion 12 of the liquid tank 10 to support the liquid tank 10, a lower wall 24 facing the upper wall 23, and a peripheral wall 25 that connects the upper wall 23 and the lower wall 24. The lower wall 24 of the device body 20 is provided with a leg member 24a for placing the device body 20 on the ground or the like (refer to FIG. 1). For example, when the device body 20 is placed at a horizontal position, a bottom surface 24b of the lower wall 24 of the device body 20 is disposed along substantially the horizon.

[0019] An insertion portion 25a through which a battery for operating the power devices such as the pump and the motor is inserted is formed in a part of the peripheral wall 25 of the body case 21. The insertion portion 25a is an opening formed in the peripheral wall 25, and connects the inside and the outside of the body case 21. As illustrated in FIG. 3, the insertion portion 25a may be closed with a cover 25b. When the battery is attached and detached, the cover 25b is opened and closed by a user. In the present embodiment, the cover 25b (namely, the insertion portion 25a) is provided on a front side of a right side surface in the peripheral wall 25 of the body case 21. Incidentally, in the illustrated example, a knob 25c or the like by which the strength of a liquid flow is adjusted is disposed on a rear side of the right side surface in the peripheral wall 25 of the body case 21.

[0020] In addition, in the illustrated example, a pocket 27 which accommodates a discharge nozzle or the like is formed on a rear side of the peripheral wall 25. An upper portion of the peripheral wall 25 is formed to protrude to an upper side from the upper wall 23. In one example, the peripheral wall 25 protruding upward from a peripheral edge of the upper wall 23 forms a support wall 26. The body case 21 supports the liquid tank 10 in a state where a lower portion of the liquid tank 10 is accommodated in a region surrounded by the support wall 26. Incidentally, in the illustrated example, a pair of the lock levers 26a provided in the support wall 26 engage with the lock portion 16 of the liquid tank 10, so that the liquid tank 10 can be fixed to the body case 21.

[0021] The upper wall 23 includes a recessed portion

31, a flat portion 32, a step portion 34, a groove 36, and a flow path 37. The recessed portion 31 is a portion that is recessed downward from the height position of the flat portion 32 at the center of the upper wall 23. The recessed portion 31 of the illustrated example has a substantially circular shape in a plan view. In addition, the recessed portion 31 has a substantially mortar shape, and has a peripheral surface 31b which is inclined such that the diameter is increased as the peripheral surface 31b extends upward from a bottom surface 31a. For example, the diameter of the bottom surface 31a of the recessed portion 31 is larger than the outer diameter of the connection portion 14 of the liquid tank 10. In addition, the size (depth from the flat portion 32) of the recessed portion 31 is larger than the size (height from the bottom portion 12) of the connection portion 14 of the liquid tank 10 in the upward and downward direction. For this reason, the connection portion 14 can be accommodated inside the recessed portion 31.

[0022] A liquid supply nozzle 40 connected to the valve 14a of the liquid tank 10 is provided at the center of the upper wall 23. In one example, the pump accommodated in the body case 21 is driven to suction the chemical solution from the valve 14a of the liquid tank 10 through the liquid supply nozzle 40. The chemical solution is pressure fed to a discharge port 25d (refer to FIG. 1) exposed from the peripheral wall 25 of the body case 21. Accordingly, the chemical solution can be discharged from the discharge nozzle that is connected to the discharge port 25d via, for example, a hose or the like. Incidentally, in the liquid discharge device 1 of the illustrated example, the hose, the discharge nozzle, and the like are removed and are not drawn.

[0023] The liquid supply nozzle 40 includes an inner nozzle 41 and an outer nozzle 45. As illustrated in FIGS. 5 and 6, the inner nozzle 41 is disposed inside the body case 21 such that a part of the inner nozzle 41 is located above the upper wall 23. The inner nozzle 41 of one example includes a tubular portion 42 having a tubular shape, and a flange portion 43 provided in a lower portion of the tubular portion 42 to protrude from the tubular portion 42 in a radial direction. The tubular portion 42 protrudes to the outside of the body case 21 through an opening 31c provided at the center of the bottom surface 31a of the recessed portion 31. The tubular portion 42 is connected to a pipe, which is connected to the pump, below the flange portion 43. Accordingly, the liquid can be supplied to the pump through the tubular portion 42. The flange portion 43 has a disk shape having a larger diameter than that of the opening 31c formed in the recessed portion 31, and is in contact with a lower surface of the recessed portion 31. In one example, a protrusion 31d through which the lower surface of the recessed portion 31 is in contact with the flange portion 43 is formed in the lower surface of the recessed portion 31.

[0024] The outer nozzle 45 includes a small diameter portion 46, and a large diameter portion 47 that is formed to be continuous with the small diameter portion 46. The

small diameter portion 46 is a portion that is inserted into the recessed portion 14b formed in the connection portion 14 of the liquid tank 10, and has a tubular shape. The diameter of the small diameter portion 46 is smaller than the diameter of the recessed portion 14b formed in the connection portion 14. When the small diameter portion 46 is inserted into the recessed portion 14b, the valve 14a inside the recessed portion 14b is pressed. Namely, the valve 14a is opened. In one example, a groove 46a in which an O-ring is mounted is formed at a tip of the small diameter portion 46 in a circumferential direction. When the small diameter portion 46 is inserted into the recessed portion 14b of the connection portion 14, a gap between the recessed portion 14b and the small diameter portion 46 is sealed by the O-ring.

[0025] The large diameter portion 47 has a cylindrical shape having a larger diameter than that of the small diameter portion 46. A center axis of the large diameter portion 47 and a center axis of the small diameter portion 46 coincide with each other. The center axis may coincide with, for example, a vertical direction in a state where the body case 21 is placed on a horizontal ground or the like. The inner diameter of the large diameter portion 47 may be substantially the same as the outer diameter of the tubular portion 42 of the inner nozzle 41. The tubular portion 42 of the inner nozzle 41 is fitted to an inner periphery of the large diameter portion 47, so that the inner nozzle 41 and the outer nozzle 45 are connected to each other. As in the illustrated example, the tubular portion 42 of the inner nozzle 41, which protrudes upward from the opening 31c, and the large diameter portion 47 of the outer nozzle 45 are fitted to each other, so that the liquid supply nozzle 40 is fixed to the center of the recessed portion 31 of the upper wall 23. In one example, a lower end (end portion on a side opposite an end portion on a small diameter portion 46 side) of the large diameter portion 47 is a thick portion 48 that is formed thick. A groove 48a having a ring shape is formed in the thick portion 48 to face the bottom surface 31a of the recessed portion 31 of the upper wall 23. A packing such as an O-ring is disposed in the groove 48a, so that a gap between the liquid supply nozzle 40 and the upper wall 23 is sealed.

[0026] The flat portion 32 is provided outside the recessed portion 31 to surround the recessed portion 31. The flat portion 32 has a flat upper surface without unevenness. The flat portion 32 may be inclined in one direction of the forward and rearward direction in a state where the body case 21 is placed on a horizontal ground or the like. The inclination has, for example, a gradient such that the liquid flows downstream in a natural state. In the body case 21 of one example, the flat portion 32 is inclined downward toward a pocket 27 side. In addition, as illustrated in FIGS. 3 and 4, the flat portion 32 of one example has a substantially rectangular shape in a plan view. The flat portion 32 is in contact with a front surface, and is separated from right and left surfaces and a rear surface among inner peripheral surfaces of the support wall 26. In addition, the flat portion 32 is divided into a

plurality of sections (three in the illustrated example) by the flow path 37 to be described later.

[0027] The step portion 34 is a portion in which the leg portion 13 of the liquid tank 10 is accommodated. The step portions 34 of the illustrated example are provided at both ends in the rightward and leftward direction of the upper wall 23, respectively. Namely, the step portion 34 is formed from a front end to a rear end of the upper wall 23 between the flat portion 32 and the support wall 26 in the rightward and leftward direction. The step portion 34 is recessed downward from the height position of the flat portion 32 (refer to FIG. 5). For example, the size (depth of a recess) of the step portion 34 may be smaller than the size of the leg portion 13 of the liquid tank 10 in the upward and downward direction. In this case, a gap is formed between the flat portion 32 and the bottom portion 12 of the liquid tank 10 in a state where the liquid tank 10 is supported on the body case 21.

[0028] In addition, the step portion 34 is provided with a mark 34a indicating a position different from the position of the insertion portion 25a in the peripheral wall 25 of the body case 21. The mark 34a of one example is provided at a position (rear left) facing the position (front right) of the insertion portion 25a with the liquid supply nozzle 40 interposed therebetween in a plan view. The mark 34a of the illustrated example is an imprint formed in the step portion 34, and has a shape representing an arrow. The arrow points to a rear left corner of the body case 21.

[0029] The groove 36 is recessed downward from the height position of the flat portion 32, and is formed to be deeper than the depth of the recessed portion 31 (refer to FIG. 6). The groove 36 is formed in a part of the peripheral edge of the upper wall 23. For example, the groove 36 may be formed in one end portion in the forward and rearward direction of the upper wall 23. The groove 36 of one example is formed in an end portion on the pocket 27 side (namely, rear side) of the upper wall 23 from the position of one step portion 34 to the position of the other step portion 34 of the step portions 34 formed at both the ends in the rightward and leftward direction. Namely, the groove 36 is formed along a lower end of an inclined surface formed by the flat portion 32. For this reason, the flat portion 32 is inclined downward toward the groove 36.

[0030] The flow path 37 includes a pair of first flow paths 37b that connect the recessed portion 31 and a pair of the step portions 34, and a second flow path 37a that connects the recessed portion 31 and the groove 36. Each of the first flow paths 37b is recessed downward from the height position of the flat portion 32, and extends in the rightward and leftward direction. For example, the depth of the first flow path 37b from the flat portion 32 is substantially the same as the depth of the step portion 34, and is shallower than the depth of the recessed portion 31 in the upward and downward direction. In addition, the first flow path 37b is inclined downward from a step portion 34 side toward a recessed portion 31 side. The

inclination has, for example, a gradient such that the liquid flows downstream in a natural state.

[0031] The second flow path 37a is recessed downward from the height position of the flat portion 32, and extends in the forward and rearward direction. For example, the depth of the second flow path 37a from the flat portion 32 is the same as the depth of the recessed portion 31, or is deeper than the depth of the recessed portion 31, and is shallower than the depth of the groove 36 in the upward and downward direction. In addition, the second flow path 37a is inclined downward from the recessed portion 31 side toward a groove 36 side. The inclination has, for example, a gradient such that the liquid flows downstream in a natural state.

[0032] In the liquid discharge device 1 described above, the liquid tank 10 is mounted in the device body 20, so that the valve 14a of the liquid tank 10 and the liquid supply nozzle 40 of the device body 20 are connected to each other. Accordingly, the liquid such as a chemical solution stored in the liquid tank 10 is supplied to the device body 20, and the chemical solution is discharged from the discharge port 25d by operation of the pump or the like. In one example, the discharge nozzle is connected to the discharge port 25d via the hose, and the chemical solution or the like can be discharged from the discharge nozzle in a desired state.

[0033] In the liquid discharge device 1 described above, it is considered that, for example, when the liquid tank 10 is removed from the device body 20, or the like, the liquid such as a chemical solution flows into the upper wall 23 of the device body 20. In this case, in the liquid discharge device 1 of one example, even when the liquid flows into the recessed portion 31 surrounding the liquid supply nozzle 40, the liquid flows from the recessed portion 31 through the second flow path 37a to be stored in the groove 36. As described above, since the liquid is unlikely to be stored in the recessed portion 31 surrounding the liquid supply nozzle 40, the liquid is suppressed from infiltrating into the device body 20 from around the liquid supply nozzle 40. Accordingly, the power devices such as the pump, the motor, and the like disposed inside the device body 20 is suppressed from being exposed to the liquid.

[0034] In addition, the upper wall 23 includes the flat portion 32 surrounding the recessed portion 31, and the flat portion 32 is inclined downward toward the groove 36 side. In this configuration, the liquid which has flowed into the upper wall 23 easily flows toward the groove 36 without passing through the recessed portion 31. Namely, when the liquid flows into a side behind the first flow paths 37b in the flat portion 32, the liquid flows downstream due to the inclination of the flat portion 32, and is stored in the groove 36 as it is. Incidentally, when the liquid flows into a side in front of the first flow paths 37b in the flat portion 32, the liquid flows from the flat portion 32 to the first flow paths 37b. Then, the liquid flows from the first flow paths 37b through the recessed portion 31 and the second flow path 37a to be stored in the groove

36.

[0035] In addition, the second flow path 37a is inclined downward toward the groove 36. In this configuration, the liquid which has flowed into the recessed portion 31 easily flows toward the groove 36. In the present embodiment, the second flow path 37a is inclined downward toward the groove 36 in a state where the device body 20 is placed in a horizontal location. For this reason, an operation such as inclining the device body 20 to guide the liquid to the groove 36 does not need to be performed.

[0036] In addition, the insertion portion 25a through which the battery for the power devices is inserted is formed in a part of the peripheral wall of the body case 21, and the upper wall 23 of the body case 21 is provided with the mark 34a indicating a position different from the position of the insertion portion 25a in the peripheral wall of the body case 21. In this configuration, a user can easily recognize the position of the insertion portion 25a for the battery, and the liquid stored in the groove 36 of the upper wall 23 can be discharged from a position different from an insertion portion 25a side. For this reason, when the liquid stored in the groove 36 (in the region surrounded by the support wall 26) is discharged, the insertion portion 25a is suppressed from being exposed to the liquid.

[0037] The exemplary embodiment of the present invention has been described above, and the present invention is not limited to the embodiment.

[0038] The high-pressure washer has been illustrated as an example of the liquid discharge device. The liquid discharge device may include a supply nozzle that supplies the liquid to the device body, and the form of discharge of the liquid is not particularly limited. For example, the liquid discharge device may be a liquid spray device or the like.

[0039] In addition, an example where the mark is provided in the step portion has been illustrated; however, the mark may be provided at another position in the upper wall, for example, in the flat portion or the like. In addition, since the position of drainage of the liquid, which suppresses the insertion portion for the battery from being exposed to the liquid, may be determined by the mark, the mark may be various shapes, characters, or a combination thereof other than the arrow. For example, the position of the insertion portion for the battery may be recognizable by the mark provided in the upper wall, to promote the drainage of the liquid from a location other than the position corresponding to the position of the insertion portion for the battery.

device,

wherein the body case (21) includes an upper wall (23) that faces the bottom portion (12) of the liquid tank (10) to support the liquid tank (10), and a nozzle (40) that protrudes from the upper wall (23) to be connected to the valve (14), and the upper wall (23) includes a recessed portion (31) that surrounds the nozzle (40), a groove (36) that is formed to be deeper than a depth of the recessed portion (31), and a flow path (37a) that connects the recessed portion (31) and the groove (36).

2. The liquid discharge device according to claim 1, wherein the upper wall (23) includes a flat portion (32) surrounding the recessed portion (31), and the flat portion (32) is inclined downward toward the groove (36).
3. The liquid discharge device according to claim 1, wherein the flow path (37a) is inclined downward toward the groove (36).
4. The liquid discharge device according to any one of claims 1 to 3, wherein an insertion portion (25a) through which a battery for operating the power device is inserted is formed in a part of a peripheral wall (25) of the body case (21), and the upper wall (23) of the body case (21) is provided with a mark (34a) by which a position of the insertion portion (25a) in the peripheral wall (25) is recognizable.

Claims

1. A liquid discharge device (1) that detachably holds a liquid tank (10) including a valve (14) in a bottom portion (12), the device comprising:

a body case (21) that accommodates a power

Fig.1

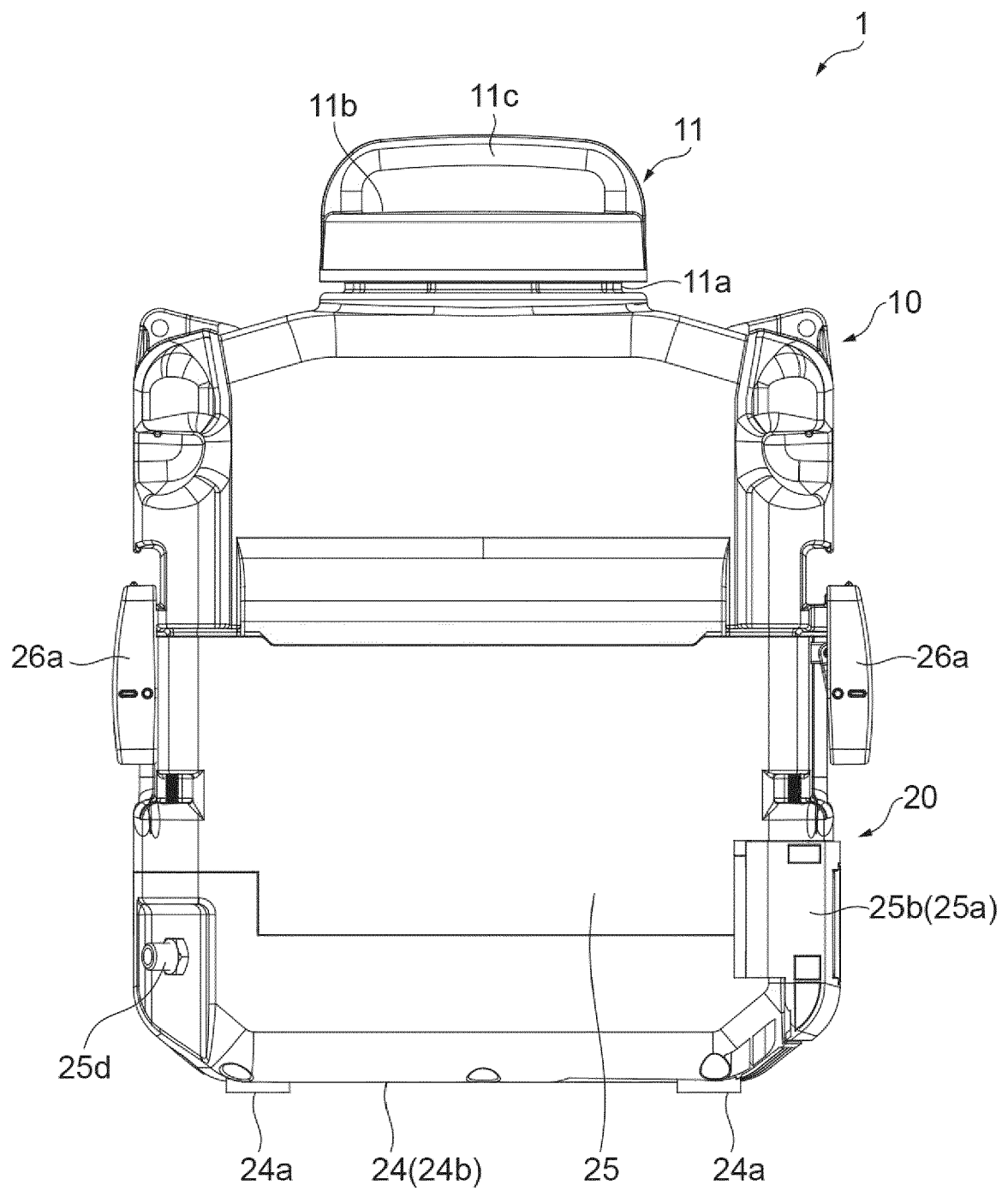


Fig.2

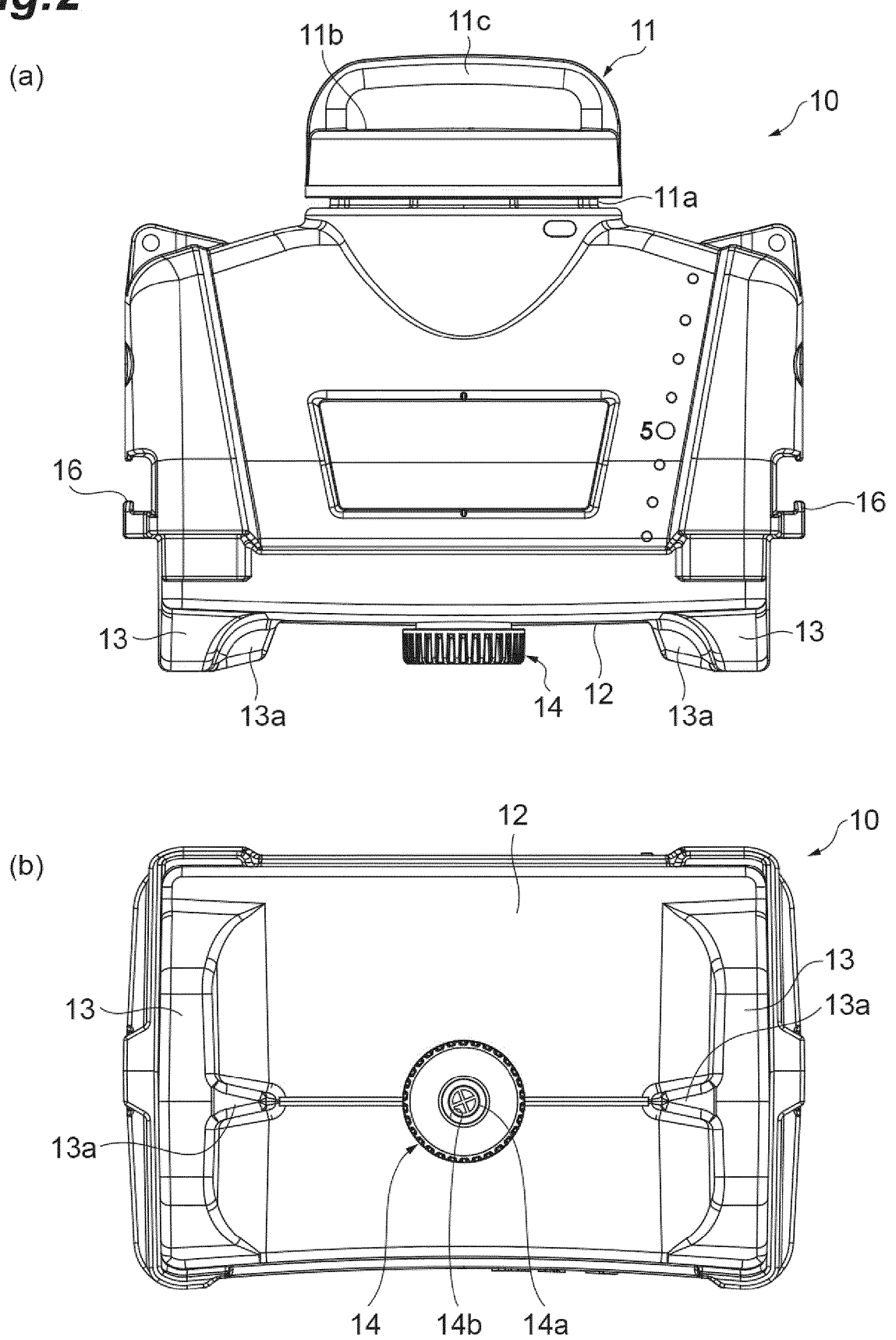


Fig.3

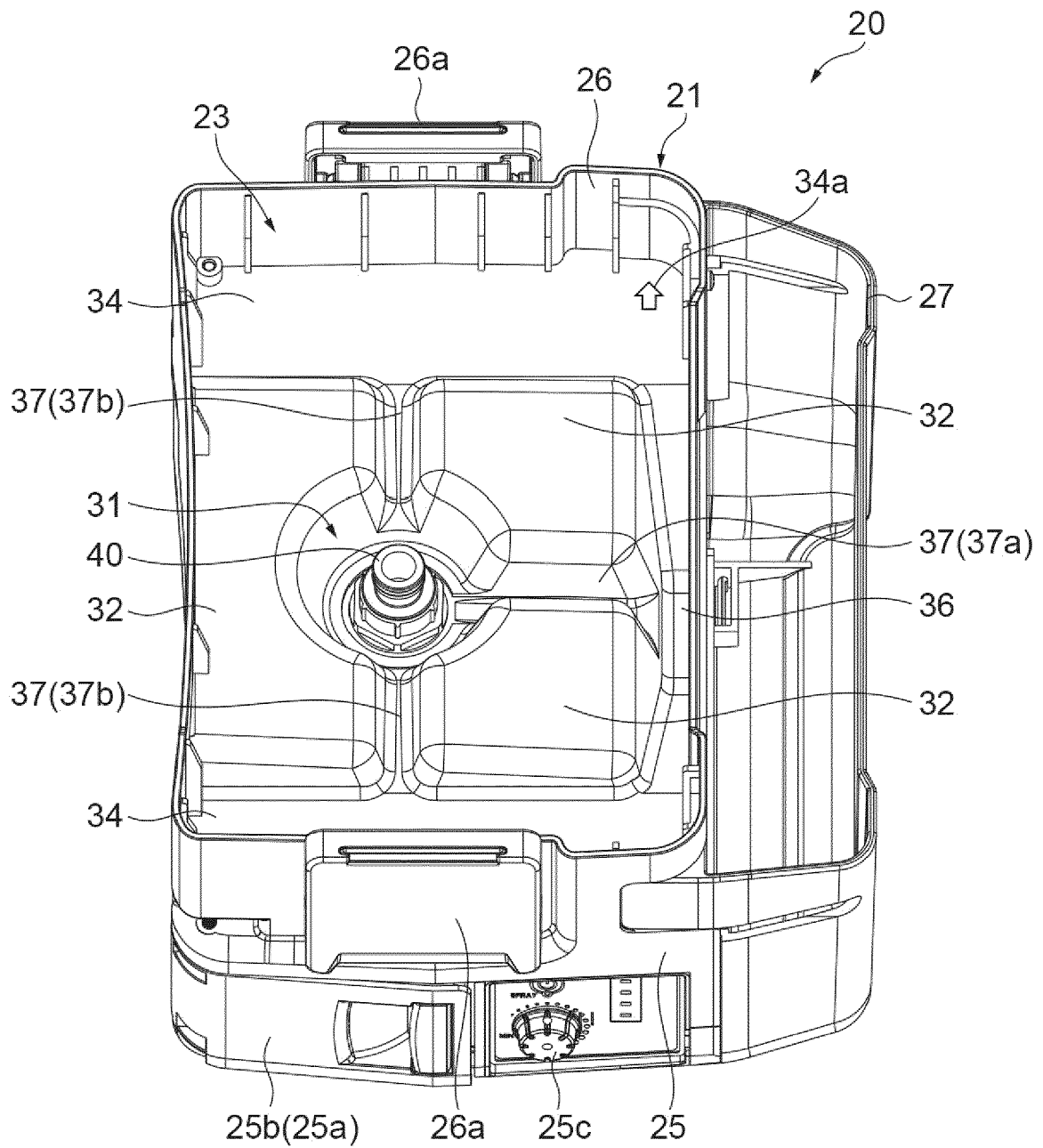


Fig.4

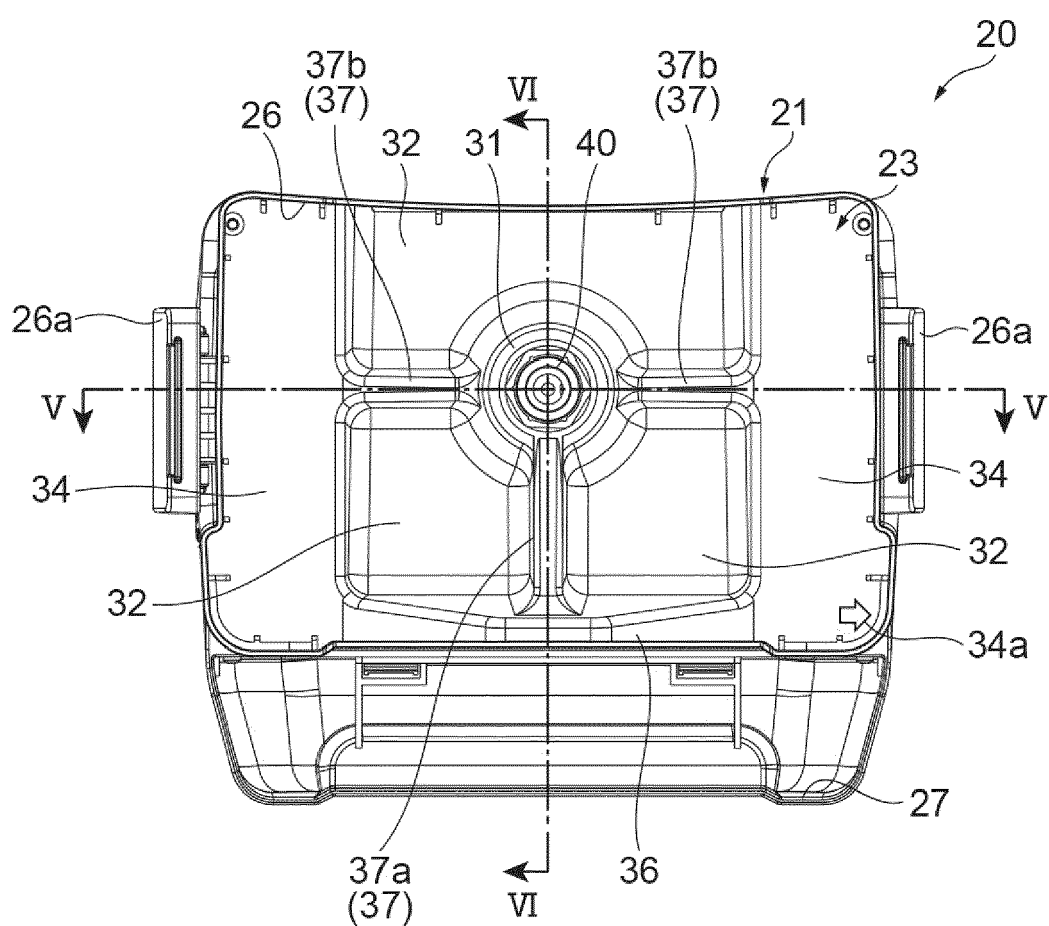


Fig.5

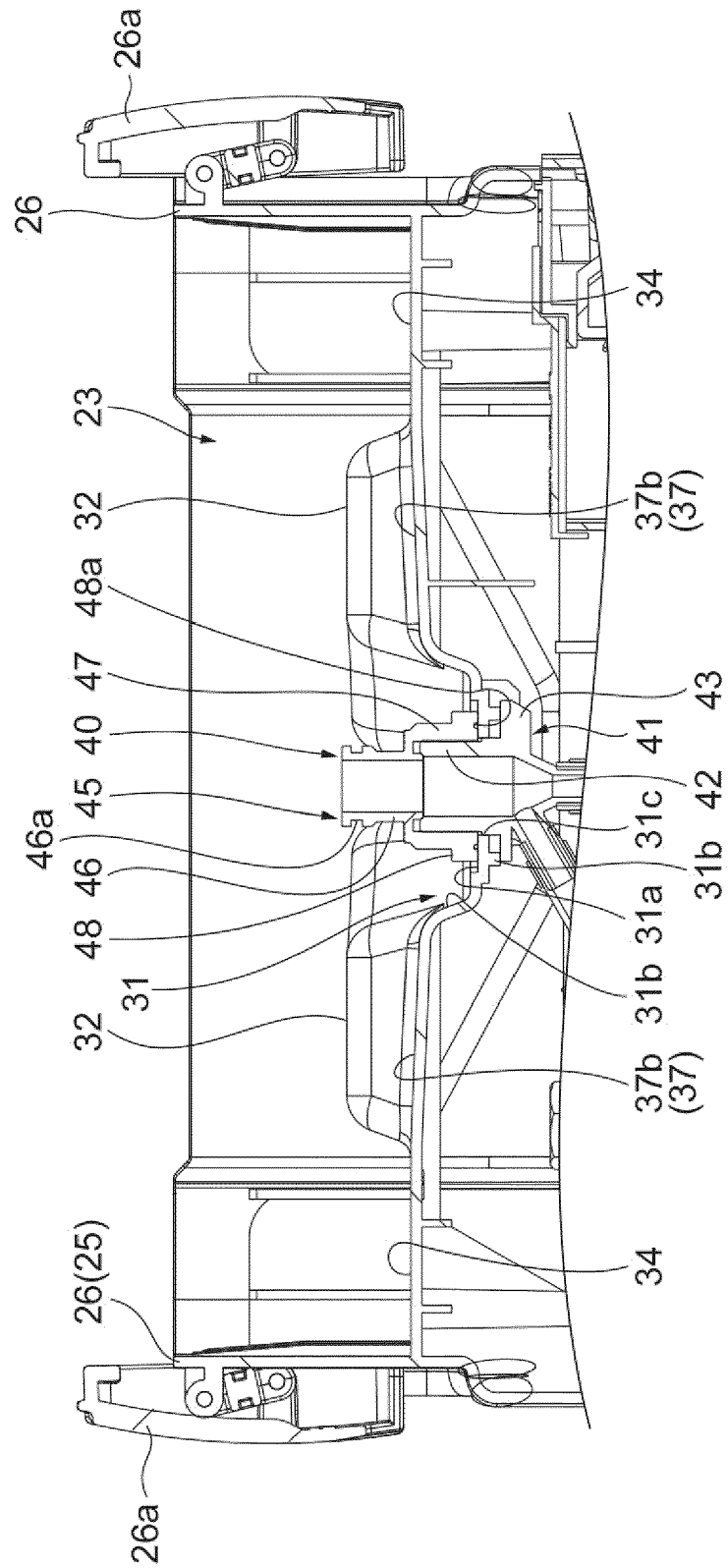
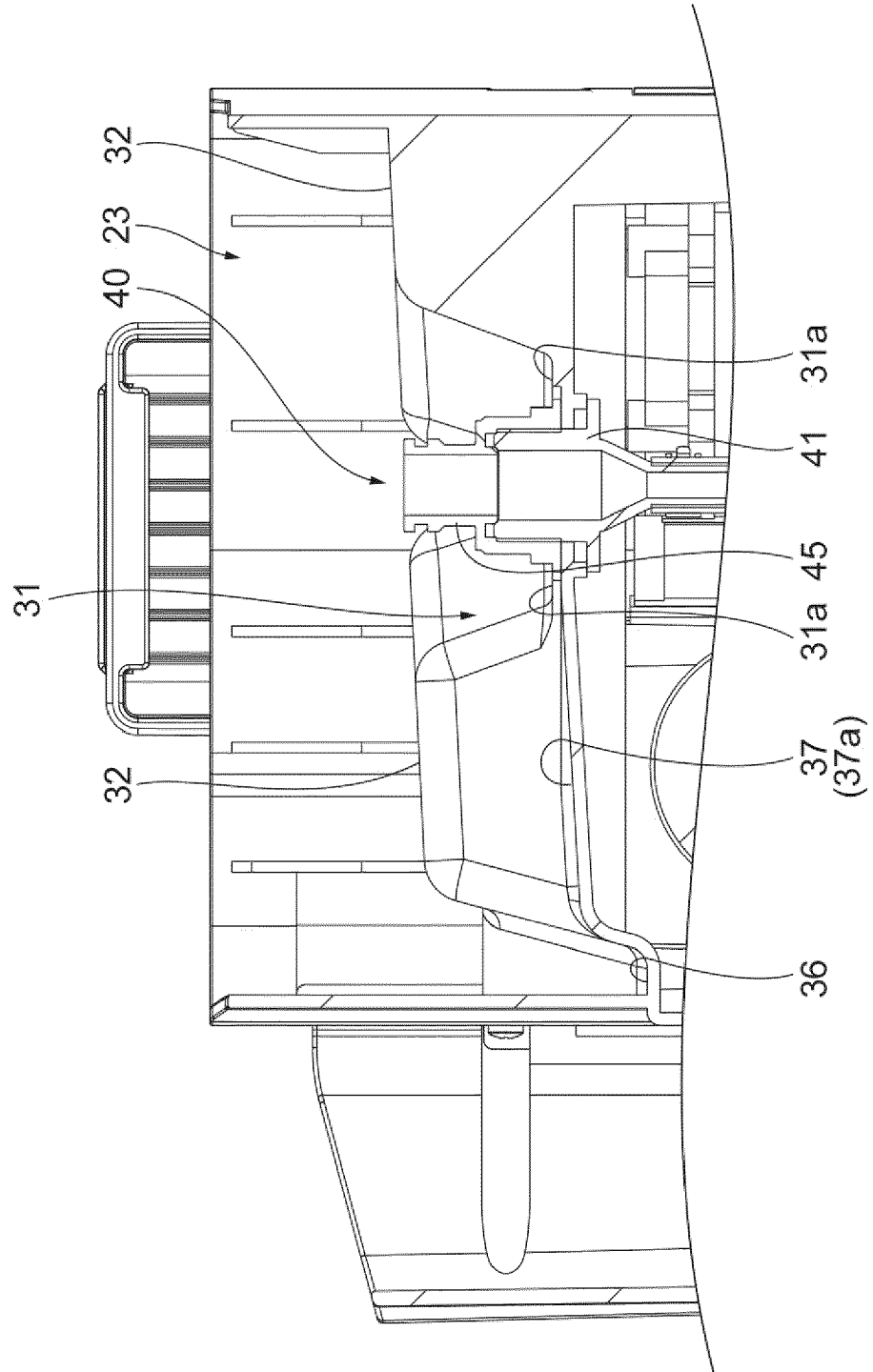


Fig.6





EUROPEAN SEARCH REPORT

Application Number
EP 21 16 7107

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 29 July 2021	Examiner Cavia Del Olmo, D
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 21 16 7107

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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