



(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
09.03.2016 Bulletin 2016/10

(51) Int Cl.:

E03D 9/08 (2006.01)

E03D 11/13 (2006.01)

A47K 13/26 (2006.01)

E03D 11/00 (2006.01)

(21) Application number: 15183298.7

(22) Date of filing: 01.09.2015

<div>(84) Designated Contracting States: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR</div> <div>Designated Extension States: BA ME</div> <div>Designated Validation States: MA</div> <div>(30) Priority: 02.09.2014 JP 2014178250</div> <div>(71) Applicant: Toto Ltd. Kitakyushu-shi, Fukuoka 802-8601 (JP)</div>	<div>(72) Inventors:</div> <div> <div>• TOGO, Tatsuro</div> <div>Kitakyushu-shi, Fukuoka 802-8601 (JP)</div> <div>• TSUJI, Kohei</div> <div>Kitakyushu-shi, Fukuoka 802-8601 (JP)</div> </div> <div>(74) Representative: Takeuchi, Maya et al Fédit-Loriot 38, avenue Hoche 75008 Paris (FR)</div>
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(54)

TOILET DEVICE

(57) According to one aspect of the invention, a toilet device mounted to a commode. An interior space is provided in the commode. The interior space communicates with a through-hole provided in an upper surface of the commode. The toilet device comprises a fixing member fixable to the commode, packing covering an outer circumference of the fixing member, and a toilet device main unit mounted above the fixing member. An insertion unit is provided in the fixing member. A water supply hose or a power supply cord connected to the toilet device main unit that is insertable through the insertion unit.

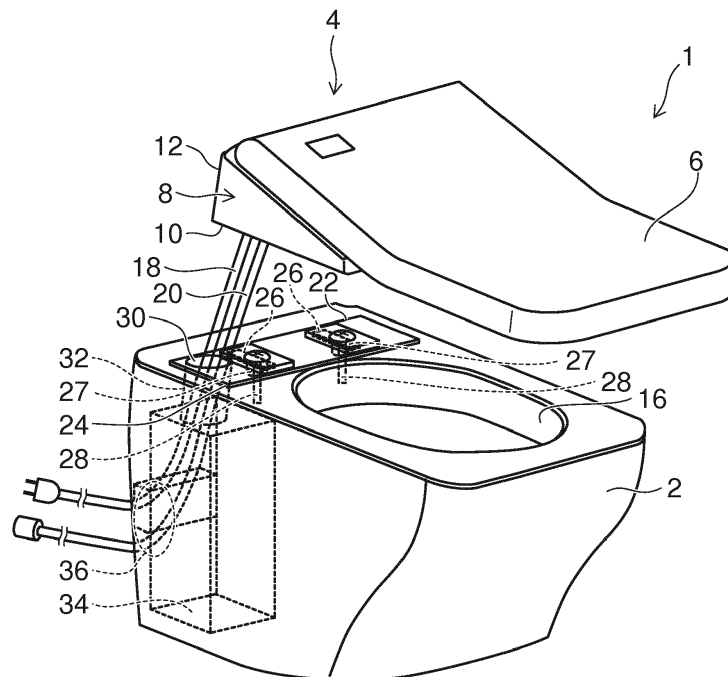


FIG. 4

Description

FIELD

[0001] Embodiments of the invention relate to a toilet device and a commode unit.

BACKGROUND

[0002] In recent years, a toilet device and a commode unit have become common.

[0003] According to JP-A 2005-290967, a sanitary washing toilet seat, which is placed on a western-style toilet and is freely removed or removable, is described.

[0004] However, for the western-style toilet on which the sanitary washing toilet seat described in the JP-A 2005-290967 is placed, the water distribution hose and the power supply cord are directly connected to the sanitary washing toilet seat from outside the western-style toilet. In other words, the water distribution hose and the power supply cord are constantly exposed outside the western-style toilet. Thereby, the design quality of the western-style toilet on which the sanitary washing toilet seat is placed is undesirably poor.

[0005] On the other hand, a method may be considered in which a through-hole is provided in the upper surface of the western-style toilet; and the water distribution hose and the power supply cord are connected to the sanitary washing toilet seat through the through-hole. However, in the case where the through-hole is provided in the upper surface of the western-style toilet, when liquid waste enters through the gap between the upper surface of the western-style toilet and the lower surface of the sanitary washing toilet seat, there is a risk that the liquid waste may undesirably enter the interior of the western-style toilet from the through-hole. Because the cleanability of the interior of the western-style toilet is poor, offensive odors may undesirably occur due to the liquid waste undesirably entering the interior of the western-style toilet.

[0006] The invention is based on the awareness of such problems and has the object of providing a toilet device and a commode unit that can improve the design quality of the commode and suppress the undesirable occurrence of offensive odors due to the liquid waste undesirably entering the interior of the commode.

SUMMARY

[0007] According to one embodiment, a toilet device is provided. The toilet device is mounted to a commode. An interior space is provided in the commode. The interior space communicates with a through-hole provided in an upper surface of the commode. The toilet device comprises a fixing member fixable to the commode, packing covering an outer circumference of the fixing member, and a toilet device main unit mounted above the fixing member. An insertion unit is provided in the fixing mem-

ber. A water supply hose or a power supply cord connected to the toilet device main unit that is insertable through the insertion unit.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008]

FIG. 1 is a schematic perspective view showing a toilet room where a commode unit according to one embodiment of the invention is mounted;

FIGS. 2 and FIG. 3 are schematic front views showing the commode unit of FIG. 1;

FIG. 4 is a schematic exploded view showing the commode unit of FIG. 1;

FIG. 5 is a schematic perspective view showing the fixing member and the packing of FIG. 4;

FIG. 6 is a schematic plan view showing the commode unit in the state in which the toilet device main unit of FIG. 4 is removed;

FIG. 7 is a schematic cross-sectional view of a cross-section A-A of the commode unit of FIG. 6; and

FIG. 8 is a schematic perspective view showing a toilet room in which a commode unit according to another embodiment of the invention is mounted.

DETAILED DESCRIPTION

[0009] A first aspect of the invention is a toilet device mounted to a commode. An interior space is provided in the commode. The interior space communicates with a through-hole provided in an upper surface of the commode. The toilet device comprises a fixing member fixable to the commode, packing covering an outer circumference of the fixing member, and a toilet device main unit mounted above the fixing member. An insertion unit is provided in the fixing member. A water supply hose or a power supply cord connected to the toilet device main unit that is insertable through the insertion unit.

[0010] According to the toilet device, the insertion unit is provided in the fixing member, where the water supply hose or the power supply cord that is connected to the toilet device main unit is insertable through the insertion unit. Thereby, the water supply hose or the power supply cord is concealed in the interior of the commode through the insertion unit and the through-hole of the commode. Thereby, the exposure of the water supply hose or the power supply cord outside the commode can be suppressed. Accordingly, the design quality of the commode can be improved.

[0011] Also, according to the toilet device, the packing that covers the outer circumference of the fixing member is included. Thereby, the liquid waste can be prevented from entering the interior space of the commode through the through-hole. Accordingly, the undesirable occurrence of offensive odors from the interior space of the commode can be suppressed.

[0012] A second aspect of the invention is that the toilet

device according to the first aspect of the invention, wherein the fixing member includes a fixing unit fixed to the commode, the fixing unit has a plate configuration, a longitudinal direction of the plate configuration is a first direction, and the insertion unit is positioned on an outer side of the fixing unit in the first direction.

[0013] According to the toilet device, in the first direction (the longitudinal direction) of the plate configuration, the insertion unit is positioned on the outer side of the fixing unit fixed to the commode. Thereby, when installing the toilet device, the installer can mount the toilet device main unit above the fixing member in a state in which viewing is easy with the naked eye. In other words, a toilet device main unit that has good installability for the commode can be provided.

[0014] A third aspect of the invention is that a commode unit comprising the commode and the toilet device according to the first or second aspect of the invention, wherein the insertion unit is an insertion through-hole provided in the fixing member and an inner diameter of the through-hole is larger than an inner diameter of the insertion through-hole.

[0015] According to the commode unit, the inner diameter of the through-hole of the commode is larger than the inner diameter of the insertion through-hole provided in the fixing member. Thereby, the water supply hose or the power supply cord that is inserted through the insertion through-hole can be inserted easily into the through-hole. In other words, a toilet device main unit that has good installability for the commode can be provided.

[0016] A fourth aspect of the invention is that the commode unit according to the third aspect of the invention further comprising a pipe member provided below the fixing member, wherein the pipe member communicates with the insertion through-hole and the inner diameter of the through-hole is larger than an outer diameter of the pipe member.

[0017] According to the commode unit, the inner diameter of the through-hole is larger than the outer diameter of the pipe member that is provided below the fixing member and communicates with the insertion through-hole. Thereby, the pipe member can guide the water supply hose or the power supply cord inserted through the insertion through-hole into the through-hole. Thereby, the water supply hose or the power supply cord that is inserted through the insertion through-hole can be inserted easily by the installer into the through-hole. In other words, a toilet device main unit that has good installability for the commode can be provided.

[0018] A fifth aspect of the invention is that the commode unit according to the fourth aspect of the invention, wherein the inner diameter of the insertion through-hole is smaller than an inner diameter of the pipe member.

[0019] According to the commode unit, the inner diameter of the insertion through-hole is smaller than the inner diameter of the pipe member. Thereby, the water supply hose or the power supply cord that is inserted through the insertion through-hole can be inserted easily by the

installer into the pipe member. In other words, a toilet device main unit that has good installability for the commode can be provided.

[0020] According to the embodiments of the invention, a toilet device and a commode unit are provided in which the design quality of the commode can be improved and the undesirable occurrence of offensive odors due to the liquid waste undesirably entering the interior of the commode is suppressed.

[0021] Embodiments of the invention will now be described with reference to the drawings. Similar components in the drawings are marked with like reference numerals, and a detailed description is omitted as appropriate.

Commode unit 1

[0022] FIG. 1 is a schematic perspective view showing a toilet room where a commode unit according to one embodiment of the invention is mounted.

[0023] FIG. 2 and FIG. 3 are schematic front views showing the commode unit of FIG. 1.

[0024] First, the commode unit 1 according to one embodiment of the invention will be described using FIG. 1 to FIG. 3.

[0025] As shown in FIG. 1 and FIG. 2, the commode unit 1 is mounted on a floor surface 101 of a toilet room 100. The commode unit 1 includes a commode 2, and a toilet device 4 that is provided above the commode 2. For example, the commode 2 is a floor-mounted water rinsing commode and is made of a ceramic. The toilet device 4 includes a toilet seat (not shown), a toilet lid 6, and a toilet device main unit 8 that is connected to the toilet seat and the toilet lid 6.

[0026] The toilet device main unit 8 includes a case plate 10, a case cover 12, and a functional unit 14. For example, the case plate 10 and the case cover 12 are made of a resin. When viewed from the front (frontward) of the commode 2, the case plate 10 is placed rearward of a bowl 16 (described in FIG. 4) provided in the commode 2. The functional unit 14 includes, for example, a sanitary washing nozzle that washes a private part of a user, and a deodorizing device that removes odors inside the bowl 16. The case cover 12 is fixed to the case plate 10 to cover the functional unit 14.

[0027] As shown in FIG. 3, a power supply cord 18 that is connected to a power supply is connected to the toilet device main unit 8; and a water supply hose 20 that is connected to a water supply source is connected to the toilet device main unit 8. The power supply cord 18 and the water supply hose 20 are flexible. For example, the power supply cord 18 supplies electricity sent from the power supply to the functional unit 14. For example, the water supply hose 20 supplies water sent from the water supply source to the sanitary washing nozzle.

Fixing member and packing

[0028] FIG. 4 is a schematic exploded view showing the commode unit of FIG. 1.

[0029] FIG. 5 is a schematic perspective view showing the fixing member and the packing of FIG. 4.

[0030] FIG. 6 is a schematic plan view showing the commode unit in the state in which the toilet device main unit of FIG. 4 is removed.

[0031] FIG. 7 is a schematic cross-sectional view of a cross-section A-A of the commode unit of FIG. 6.

[0032] A plate (a fixing member) 22 and packing 24 according to one embodiment of the invention will now be described using FIGS. 4 to 7.

[0033] As shown in FIG. 4, the toilet device 4 includes, for example, the plate (the fixing member) 22 made of a resin. The plate 22 has a plate configuration having the longitudinal direction in a first direction. For example, the plate 22 has a rectangular configuration. The first direction is, for example, a direction (the lateral direction) orthogonal to the vertical direction (referring to FIG. 1) and the frontward/rearward direction (referring to FIG. 1). A first fixing hole (a fixing unit) 26 is provided in the plate 22. The plate 22 can be fixed to the commode 2 by inserting a bolt 28 through the first fixing hole 26 into a second fixing hole 27 provided in the upper surface of the commode 2 and fastening with a nut. When mounting the toilet device main unit 8 to the commode 2, first, the plate 22 is fixed to the commode 2. The power supply cord 18 and the water supply hose 20 that are connected to the toilet device main unit 8 are inserted through an insertion through-hole (an insertion unit) 30 provided in the plate 22.

[0034] A through-hole 32 is provided in the upper surface of the commode 2. The through-hole 32 is provided on the rearward side of the bowl 16. Also, an interior space 34 is provided in the interior of the commode 2 on the rearward side of the bowl 16. The interior space 34 is made continuously with the through-hole 32. That is, the interior space 34 communicates with the through-hole 32. Further, a rear hole 36 is provided in the rear surface of the commode 2. The rear hole 36 is made continuously with the interior space 34.

[0035] When mounting the toilet device main unit 8 to the commode 2, first, the plate 22 is fixed to the commode 2. Then, the power supply cord 18 and the water supply hose 20 that are connected to the toilet device main unit 8 are inserted through the insertion through-hole 30 provided in the plate 22. The power supply cord 18 and the water supply hose 20 that are inserted through the insertion through-hole 30 pass through the through-hole 32. The power supply cord 18 and the water supply hose 20 that pass through the through-hole 32 enter the interior space 34. The power supply cord 18 that enters the interior space 34 passes through the rear hole 36 and is connected to the power supply. Also, the water supply hose 20 that enters the interior space 34 passes through the rear hole 36 and is connected to the water supply

source. Thereby, the power supply cord 18 and the water supply hose 20 can be concealed in the interior of the commode 2 through the insertion through-hole 30 and the through-hole 32 of the commode 2. Thereby, the exposure of the power supply cord 18 and the water supply hose 20 outside the commode 2 can be suppressed. Accordingly, the design quality of the commode 2 can be improved.

[0036] Subsequently, the toilet device main unit 8 is placed above the plate 22. At this time, a cutaway portion 38 that is provided in the end portion of the plate 22 engages a hook (not shown) provided in the case plate 10. Thereby, the toilet device main unit 8 can be fixed to the plate 22 easily.

[0037] As shown in FIG. 5, the toilet device 4 includes, for example, the packing 24 formed of rubber. The packing 24 covers the outer circumference of the lower surface (the surface placed on the upper surface of the commode 2) of the plate 22. Thereby, liquid waste that enters between the upper surface of the commode 2 and the toilet device main unit 8 can be prevented from undesirably entering the interior space 34 of the commode 2 via the through-hole 32. Thereby, the undesirable occurrence of offensive odors from the interior space 34 can be suppressed.

[0038] In the state in which the plate 22 is mounted to the commode 2 as shown in FIG. 6, the plate 22 is fixed to the commode 2 so that the insertion through-hole 30 of the plate 22 communicates with the through-hole 32 of the commode 2.

[0039] In the longitudinal direction of the plate 22, for example, the insertion through-hole 30 of the plate 22 is provided not less than 15 centimeters (cm) toward the outer side from a center line X of the plate 22. Also, for example, the through-hole 32 of the commode 2 is provided not less than 15 cm toward the outer side from a center line Y of the commode 2. Further, the interior space 34 of the commode 2 is provided toward the outer side from the center line Y of the commode 2. The plate 22 is fixed to the commode 2 so that the center line X and the center line Y are at the same position. Thereby, a large interior space 34 can be ensured in the interior of the commode 2 even in the case where the drain trap (not shown) of the commode 2 is positioned on the center line Y of the commode 2. Also, the power supply cord 18 and the water supply hose 20 can be concealed in the interior of the commode 2 through the insertion through-hole 30 and the through-hole 32 of the commode 2 even in the case where the drain trap of the commode 2 is positioned on the center line Y of the commode 2.

[0040] In the longitudinal direction of the plate 22, for example, the first fixing hole 26 of the plate 22 is provided not less than 10 cm toward the outer side from the center line X of the plate 22. Also, for example, the second fixing hole 27 of the commode 2 is provided not less than 10 cm toward the outer side from the center line Y of the commode 2. Thereby, the plate 22 can be easily fixed to the commode 2 by inserting the bolt 28 through the first

fixing hole 26 into the second fixing hole 27 provided in the upper surface of the commode 2 and fastening the nut even in the case where the drain trap of the commode 2 is positioned on the center line Y of the commode 2.

[0041] In the longitudinal direction of the plate 22, the insertion through-hole 30 is positioned on the outer side of the first fixing hole 26. Thereby, when installing the toilet device 4 on the commode 2, the installer can mount the toilet device main unit 8 above the plate 22 in a state in which viewing is easy with the naked eye. In other words, the toilet device main unit 8 that has good installability for the commode 2 can be provided. Also, because the installer can mount the toilet device main unit 8 above the plate 22 in the state in which viewing is easy with the naked eye, the mistake of causing the power supply cord 18 or the water supply hose 20 to be undesirably pinched between the commode 2 and the toilet device 4 can be suppressed.

[0042] As shown in FIG. 7, the toilet device 4 includes a pipe member 40 below the plate 22. The pipe member 40 is a tubular body having a circular columnar configuration and is made of a resin. For example, the lower end of the plate 22 and the upper end of the pipe member 40 are connected using a bonding agent. An inner diameter A of the through-hole 32 of the commode 2 is larger than an outer diameter B of the pipe member 40. Also, the pipe member 40 is inserted into the through-hole 32. Thereby, the water supply hose 20 or the power supply cord 18 that is inserted through the insertion through-hole 30 can be guided by the pipe member 40 into the through-hole 32. Thereby, the water supply hose 20 or the power supply cord 18 that is inserted through the insertion through-hole 30 can be inserted easily by the installer into the through-hole 32. In other words, the toilet device main unit 8 that has good installability for the commode 2 can be provided.

[0043] The inner diameter A of the through-hole 32 of the commode 2 is larger than an inner diameter C of the insertion through-hole 30. Thereby, the water supply hose 20 or the power supply cord 18 that is inserted through the insertion through-hole 30 can be inserted easily into the through-hole 32. In other words, the toilet device main unit 8 that has good installability for the commode 2 can be provided.

[0044] Also, the inner diameter C of the insertion through-hole 30 is smaller than an inner diameter D of the pipe member 40. Thereby, the water supply hose 20 or the power supply cord 18 that is inserted through the insertion through-hole 30 can be inserted easily into the pipe member 40. In other words, the toilet device main unit 8 that has good installability for the commode 2 can be provided.

[0045] Thereby, according to the toilet device 4 of the embodiment, the insertion through-hole 30 is provided in the plate 22, where the water supply hose 20 or the power supply cord 18 that is connected to the toilet device main unit 8 is insertable through the insertion through-hole 30. Thereby, the water supply hose 20 or the power supply

cord 18 is concealed in the interior of the commode 2 through the insertion through-hole 30 and the through-hole 32 of the commode 2. Thereby, the exposure of the water supply hose 20 or the power supply cord 18 outside the commode 2 can be suppressed. Accordingly, the design quality of the commode 2 can be improved.

[0046] Also, according to the toilet device 4, the packing 24 that covers the outer circumference of the lower surface of the plate 22 is included. Thereby, the liquid waste can be prevented from entering the interior space 34 of the commode 2 through the through-hole 32. Accordingly, the undesirable occurrence of offensive odors from the interior space 34 of the commode 2 can be suppressed.

Modifications

[0047] One embodiment of the invention is described above. However, the invention is not limited to such a description.

[0048] FIG. 8 is a schematic perspective view showing a toilet room in which a commode unit according to another embodiment of the invention is mounted.

[0049] Although the commode 2 is a floor-mounted water rinsing commode in one embodiment of the invention, the commode 2 is not limited thereto and may be a wall-hung water rinsing commode. In other words, as in FIG. 8, the commode unit 1A may be mounted to a wall surface 102 of the toilet room 100. The commode unit 1A has the same function as the commode unit 1 described above.

[0050] Although both the power supply cord 18 and the water supply hose 20 are connected to the toilet device main unit 8 in one embodiment of the invention, the invention is not limited thereto. In other words, one of the power supply cord 18 or the water supply hose 20 may be connected. In such a case, the water supply hose 20 or the power supply cord 18 that is connected to the toilet device main unit 8 is inserted through the insertion through-hole 30, the through-hole 32, and the rear hole 36.

[0051] Although the plate 22 has, for example, a rectangular configuration in one embodiment of the invention, the plate 22 is not limited thereto and may have, for example, a circular configuration. However, in the case where the plate 22 has a square configuration, the "longitudinal direction" of the plate 22 may be either the vertical direction or the horizontal direction of the plate 22.

[0052] Although the insertion unit is the insertion through-hole 30 having a hole configuration in one embodiment of the invention, the insertion unit is not limited thereto and may be, for example, a cutaway portion having a cutaway configuration for inserting through.

[0053] Although the plate 22 and the pipe member 40 are connected using a bonding agent in one embodiment of the invention, the invention is not limited thereto. Namely, for example, the plate 22 and the pipe member 40 may have a fitting connection or may be formed as one body.

[0054] Appropriate design modifications to the embodiments described above made by one skilled in the art also are within the scope of the invention to the extent that the features of the invention are included. For example, the configurations, dimensions, materials, arrangements, etc., of the components included in the commode unit 1, etc., the mounting method of the commode unit 1, etc., are not limited to those illustrated and can be modified appropriately.

[0055] Furthermore, various components in the above embodiment can be combined with each other as long as technically feasible. Such combinations are also encompassed within the scope of the invention as long as they include the features of the invention.

[0056] While certain embodiments have been described, these embodiments have been presented by way of example only, and are not intended to limit the scope of the inventions. Indeed, the novel embodiments described herein may be embodied in a variety of other forms; furthermore, various omissions, substitutions and changes in the form of the embodiments described herein may be made without departing from the spirit of the inventions. The accompanying claims and their equivalents are intended to cover such forms or modifications as would fall within the scope and spirit of the invention.

Claims

1. A toilet device (4) mounted to a commode (2), an interior space (34) being provided in the commode, the interior space communicating with a through-hole (32) provided in an upper surface of the commode, the toilet device comprising:
 - a fixing member (22) fixable to the commode (2);
 - packing (24) covering an outer circumference of the fixing member (22); and
 - a toilet device main unit (8) mounted above the fixing member (22),
 - an insertion unit (30) being provided in the fixing member (22), a water supply hose (20) or a power supply cord (18) connected to the toilet device main unit (8) being insertable through the insertion unit.
2. The device according to claim 1, wherein the fixing member (22) includes a fixing unit (26) fixed to the commode (2), the fixing unit having a plate configuration, a longitudinal direction of the plate configuration being a first direction, and the insertion unit (30) is positioned on an outer side of the fixing unit (26) in the first direction.
3. A commode unit (1), comprising the commode (2) and the toilet device (4) according to claim 1 or 2, the insertion unit (30) being an insertion through-hole provided in the fixing member (22),

an inner diameter of the through-hole being larger than an inner diameter of the insertion through-hole.

4. The commode unit (1) according to claim 3, further comprising a pipe member (40) provided below the fixing member (22), the pipe member communicating with the insertion through-hole (30), the inner diameter of the through-hole being larger than an outer diameter of the pipe member.
5. The commode unit (1) according to claim 4, wherein the inner diameter of the insertion through-hole is smaller than an inner diameter of the pipe member.

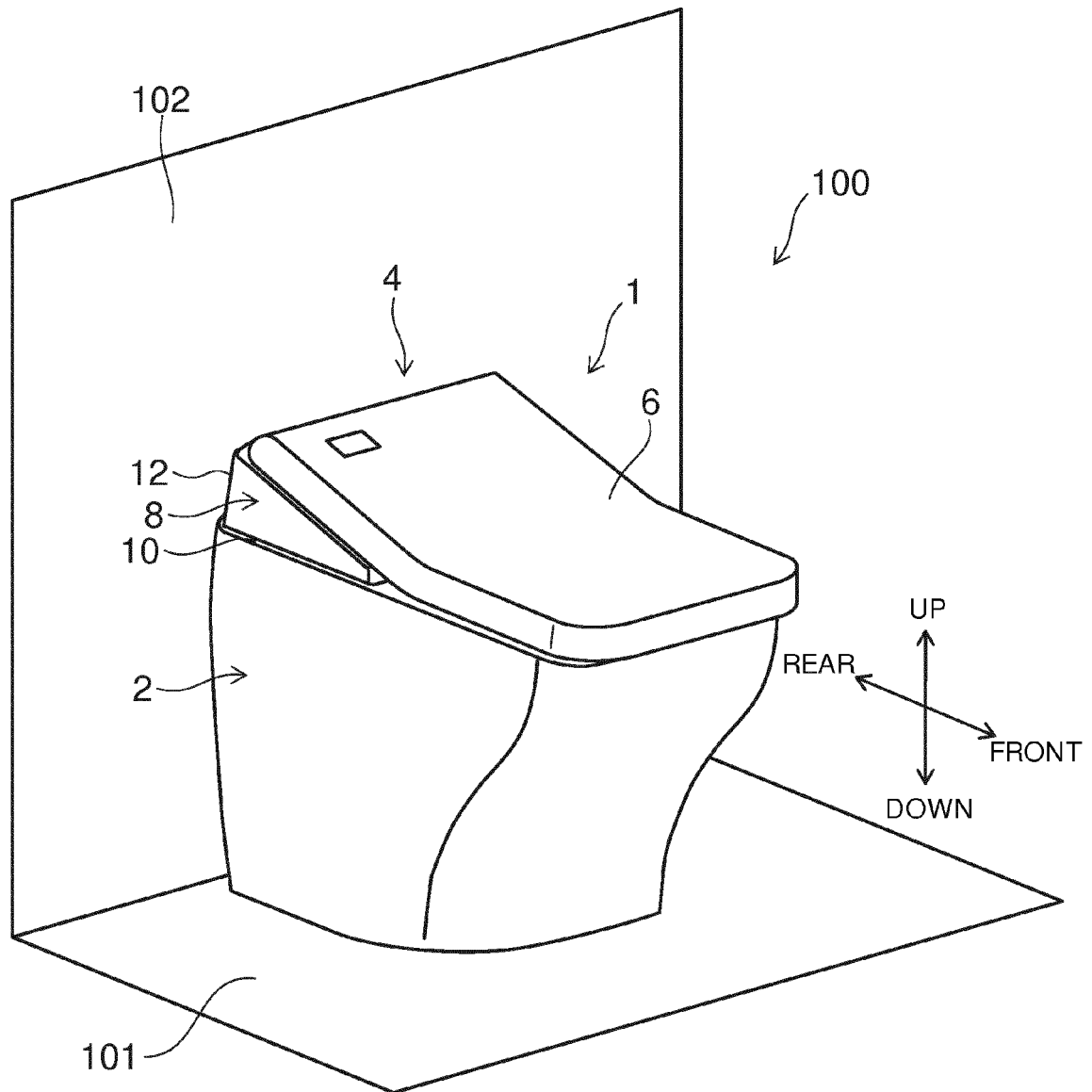


FIG. 1

FIG. 2

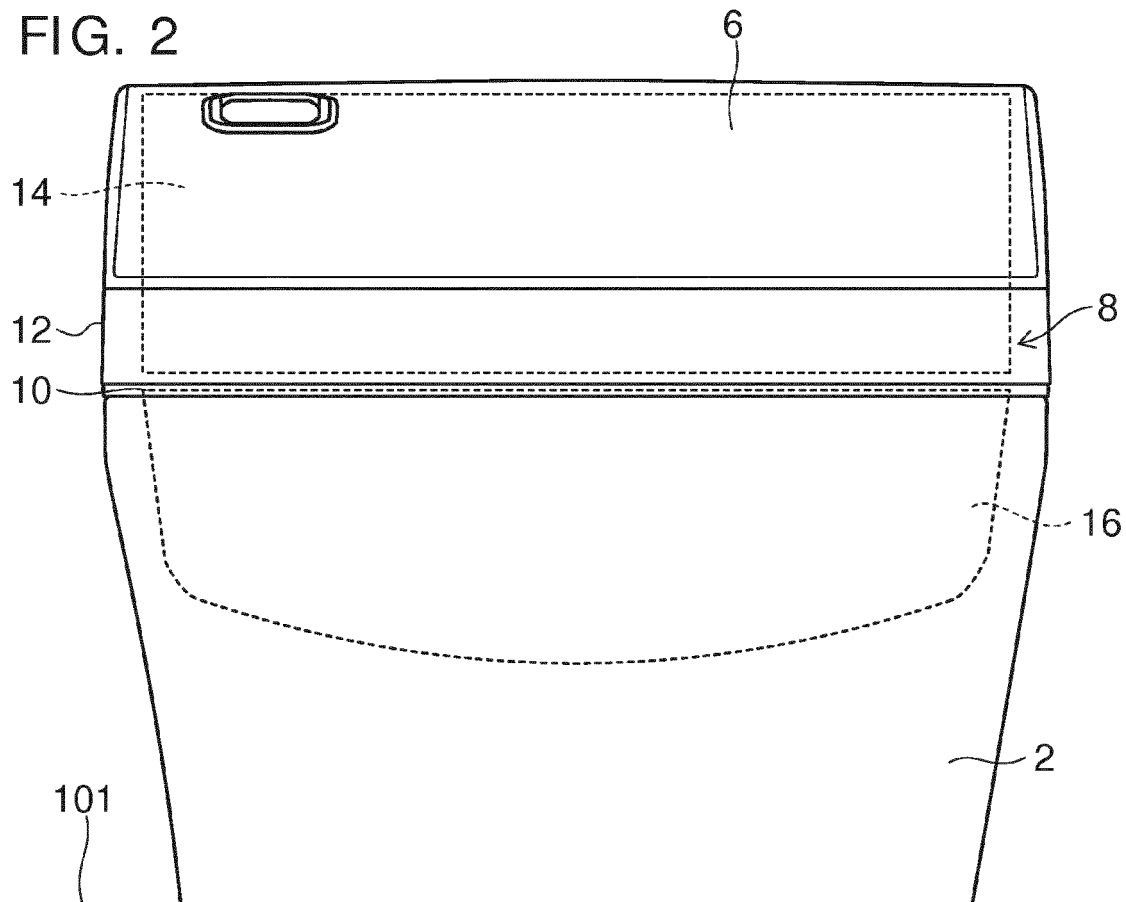
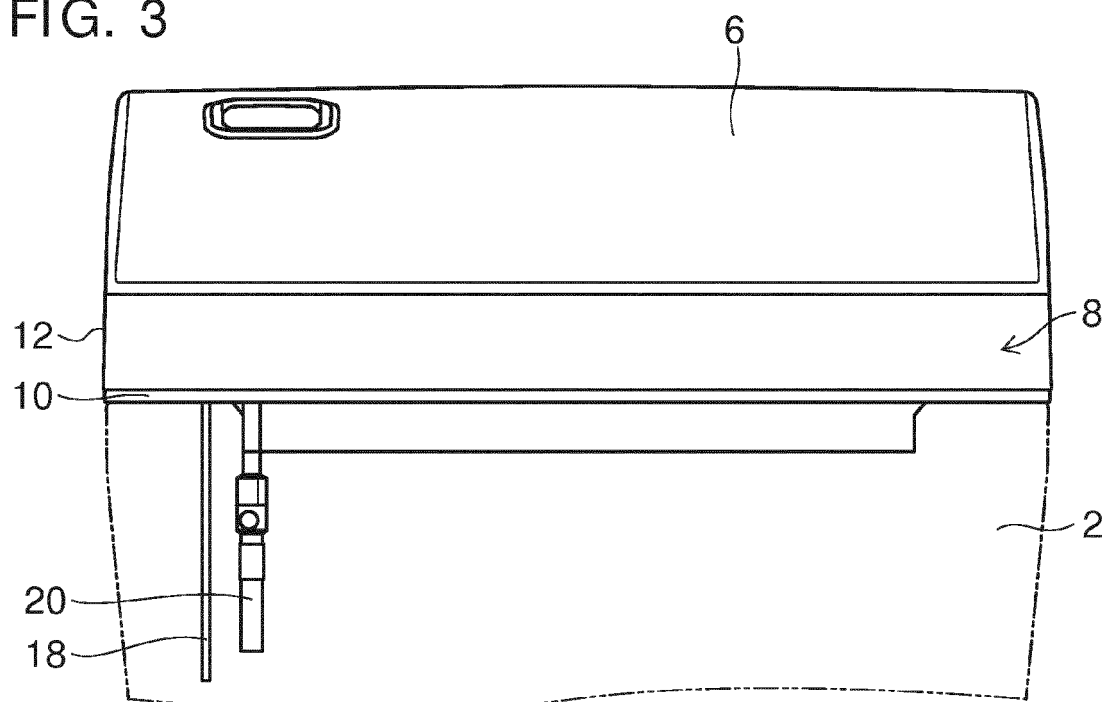


FIG. 3



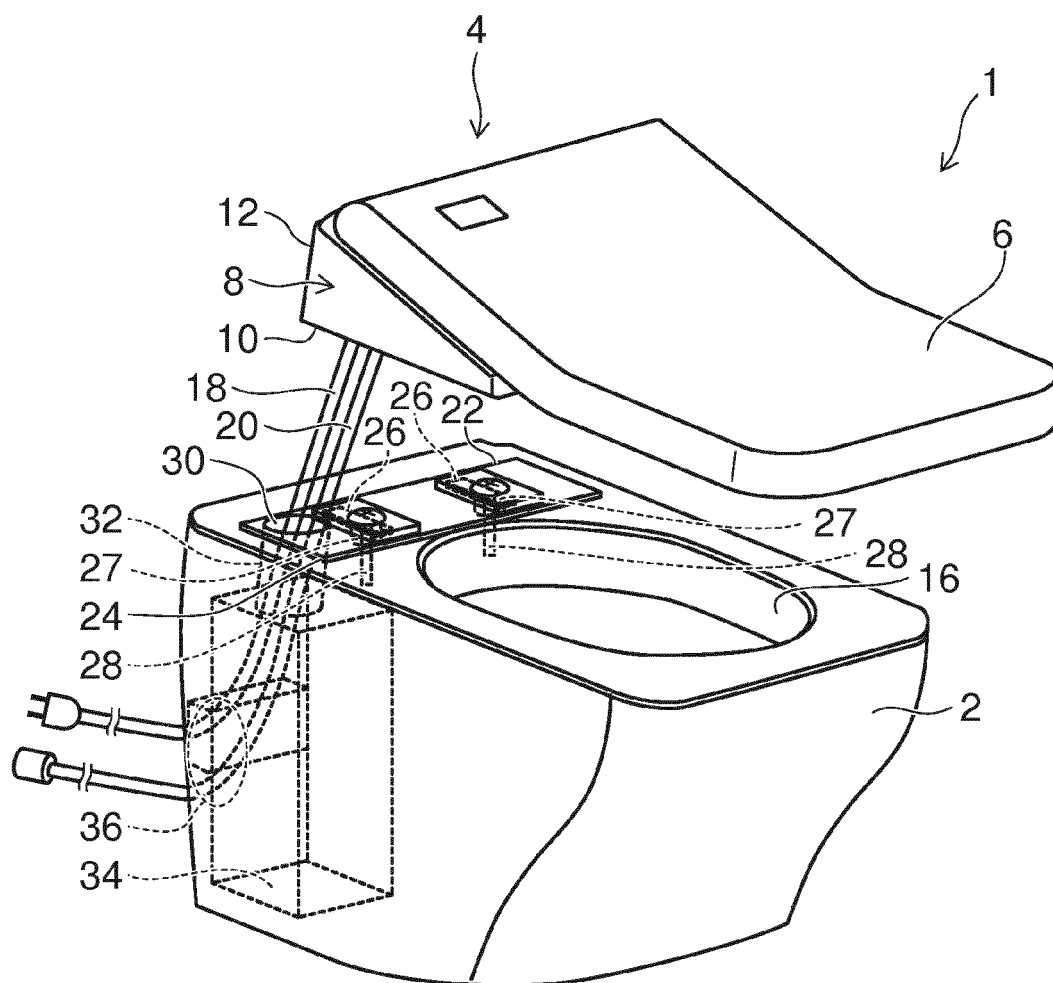


FIG. 4

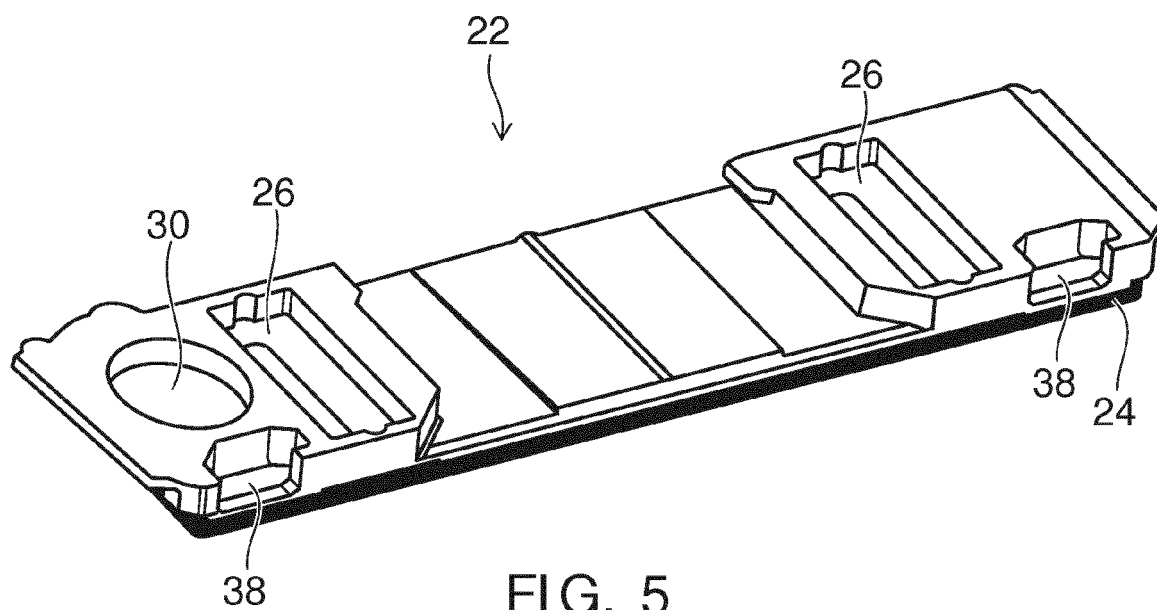


FIG. 5

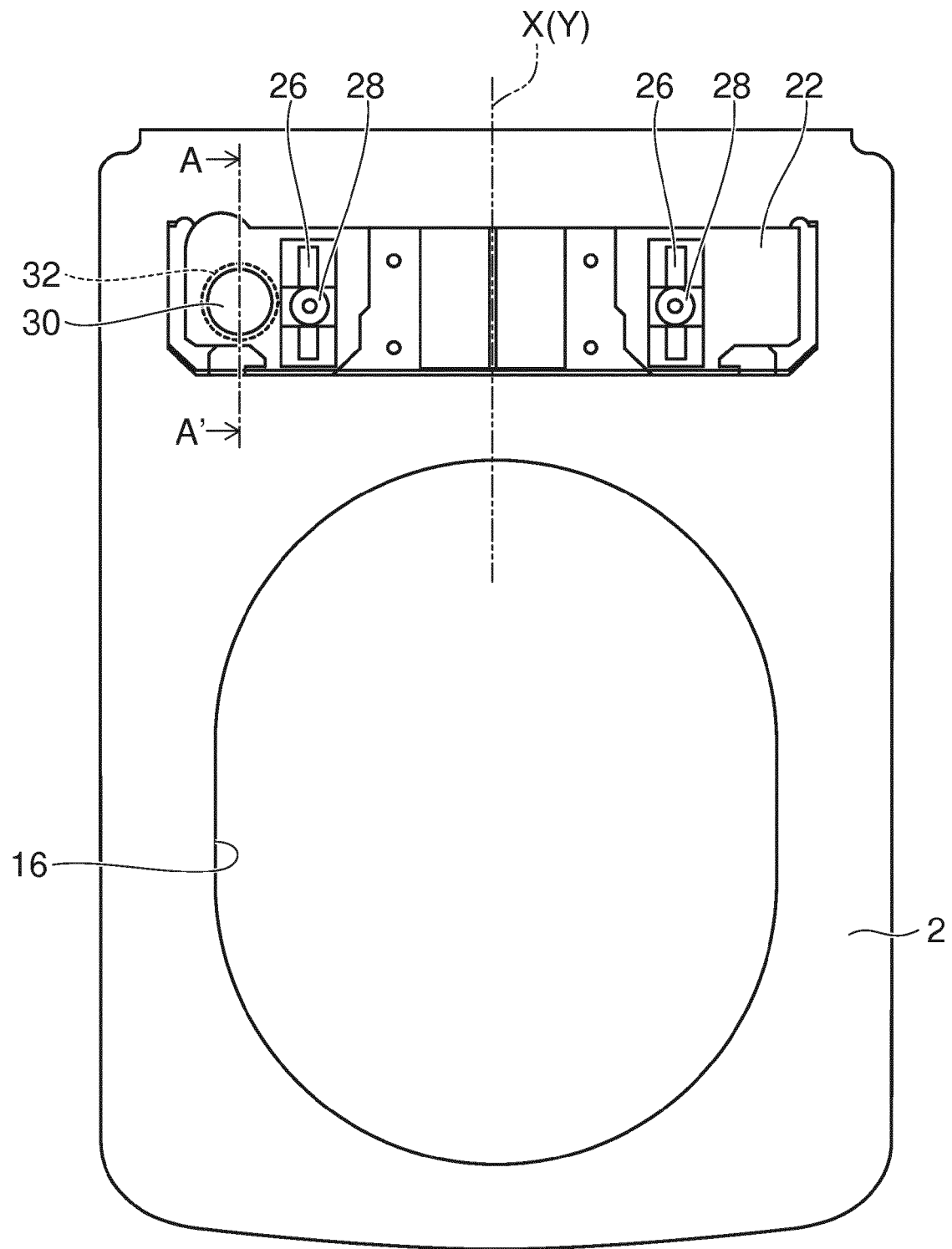


FIG. 6

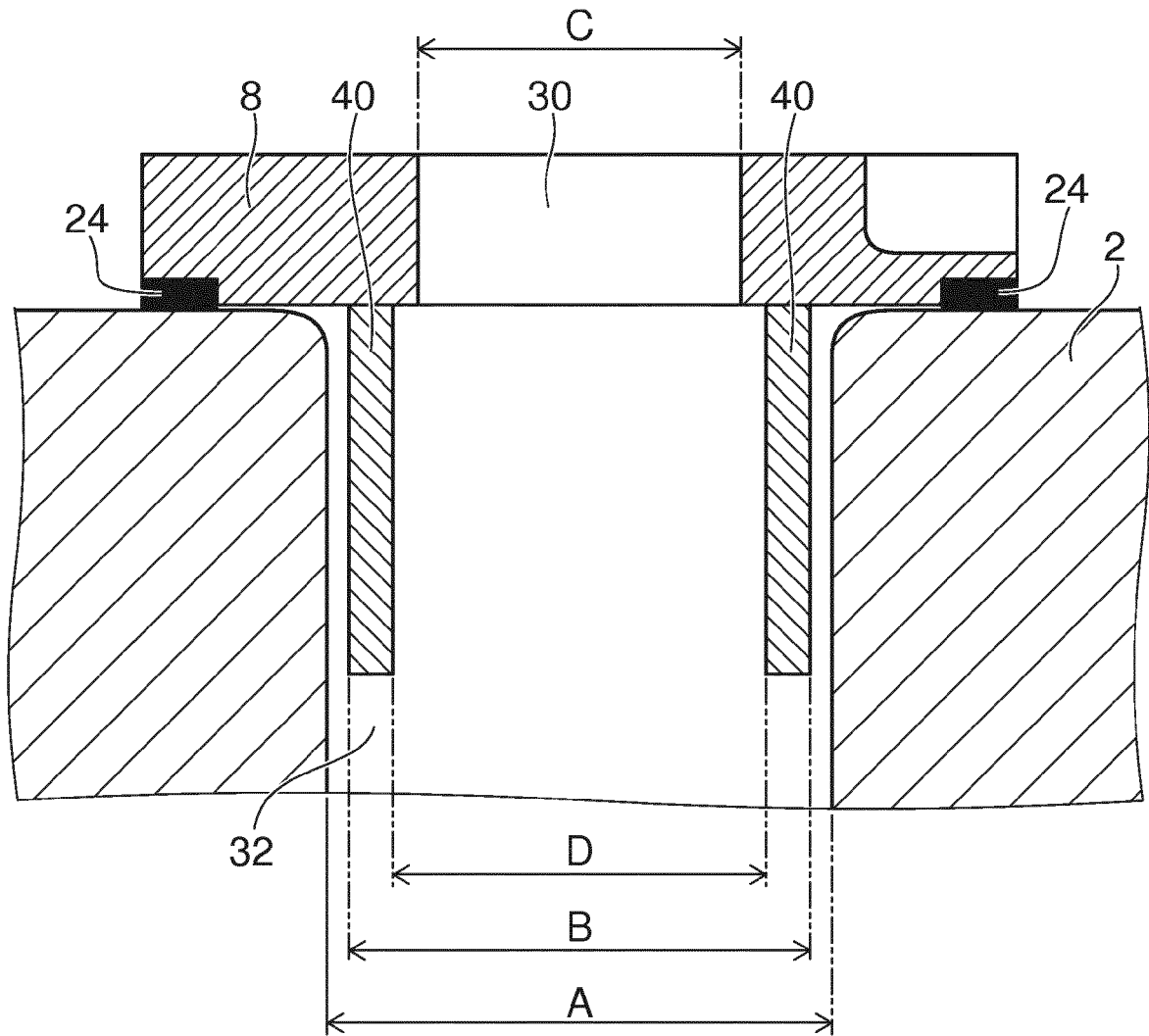


FIG. 7

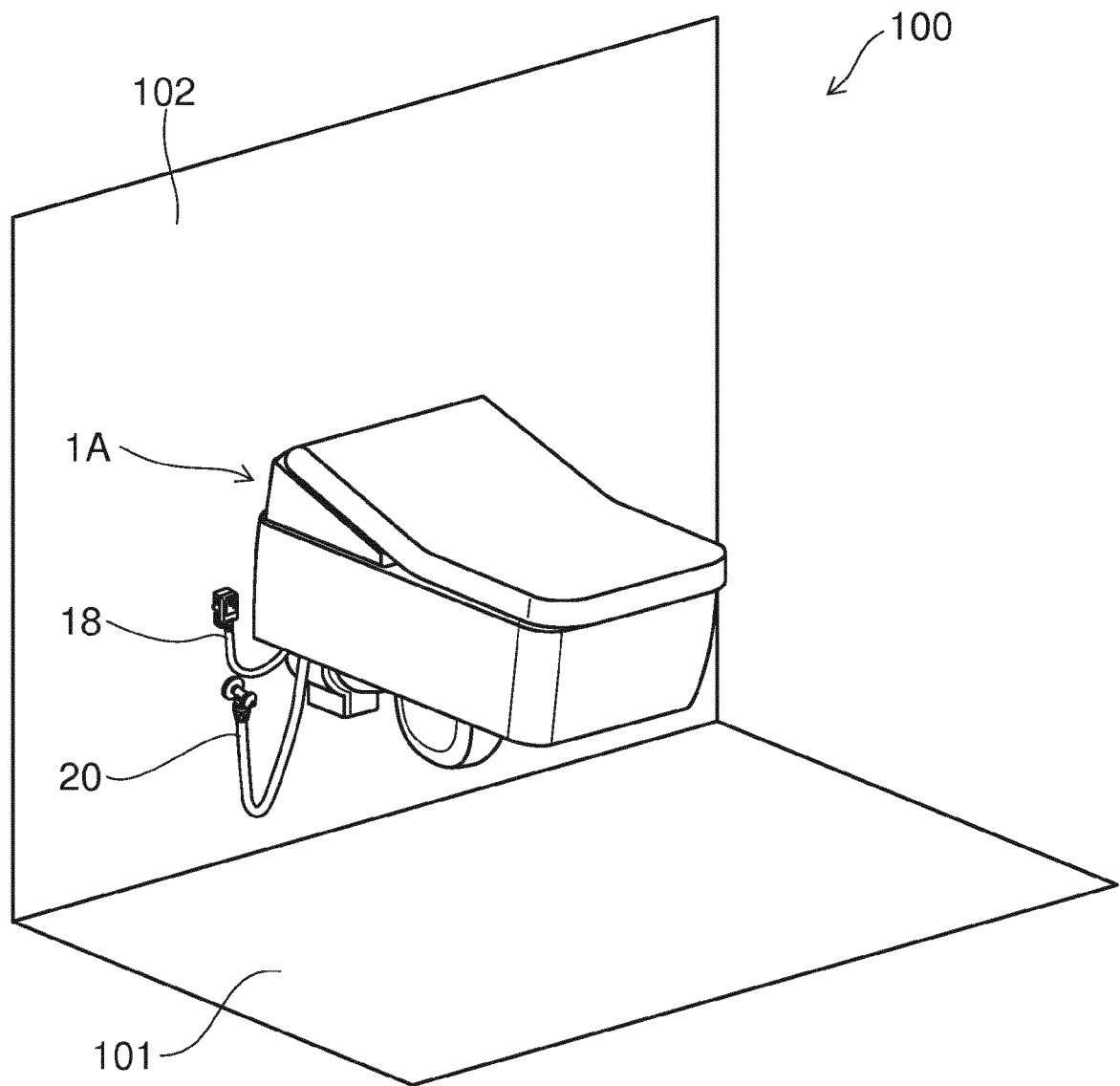


FIG. 8



EUROPEAN SEARCH REPORT

Application Number
EP 15 18 3298

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EPO FORM 1503 03.82 (P04C01)

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

EP 15 18 3298

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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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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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