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(54) MOUNTING SYSTEM FOR A FLUSHING TANK, IN PARTICULAR A CERAMIC FLUSHING TANK

(57) A mounting system (2) for a flushing tank (1), in particular a ceramic flushing tank comprises an inner cistern (5) and a mounting flange (6) provided with respective fastening members (37, 38) cooperating with one another for removably fixing the cistern (5) onto an upper face (32) of the flange (6) in a predetermined installation position in which the flange (6) projects laterally beyond the cistern (5) for providing support to an outer casing (7) which can be fitted to the outside of the cistern (5) to cover the cistern (5).

FIG. 1

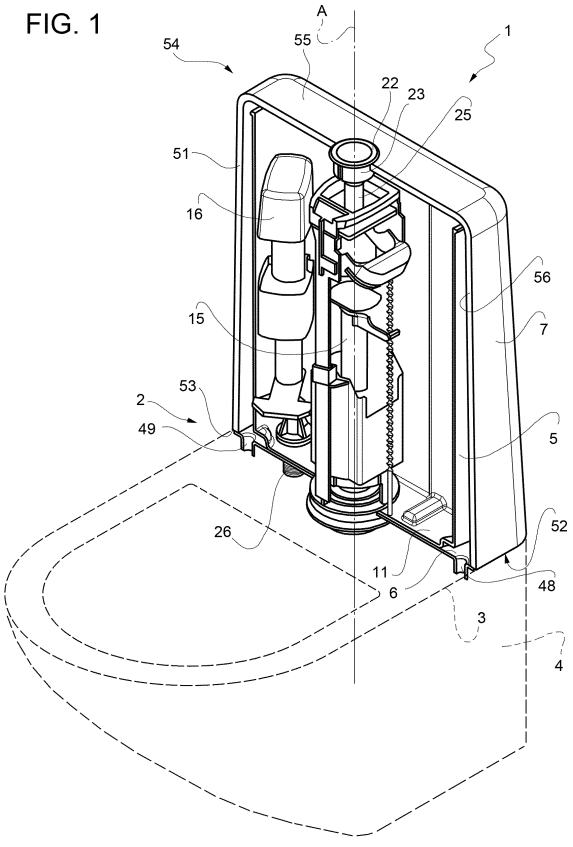

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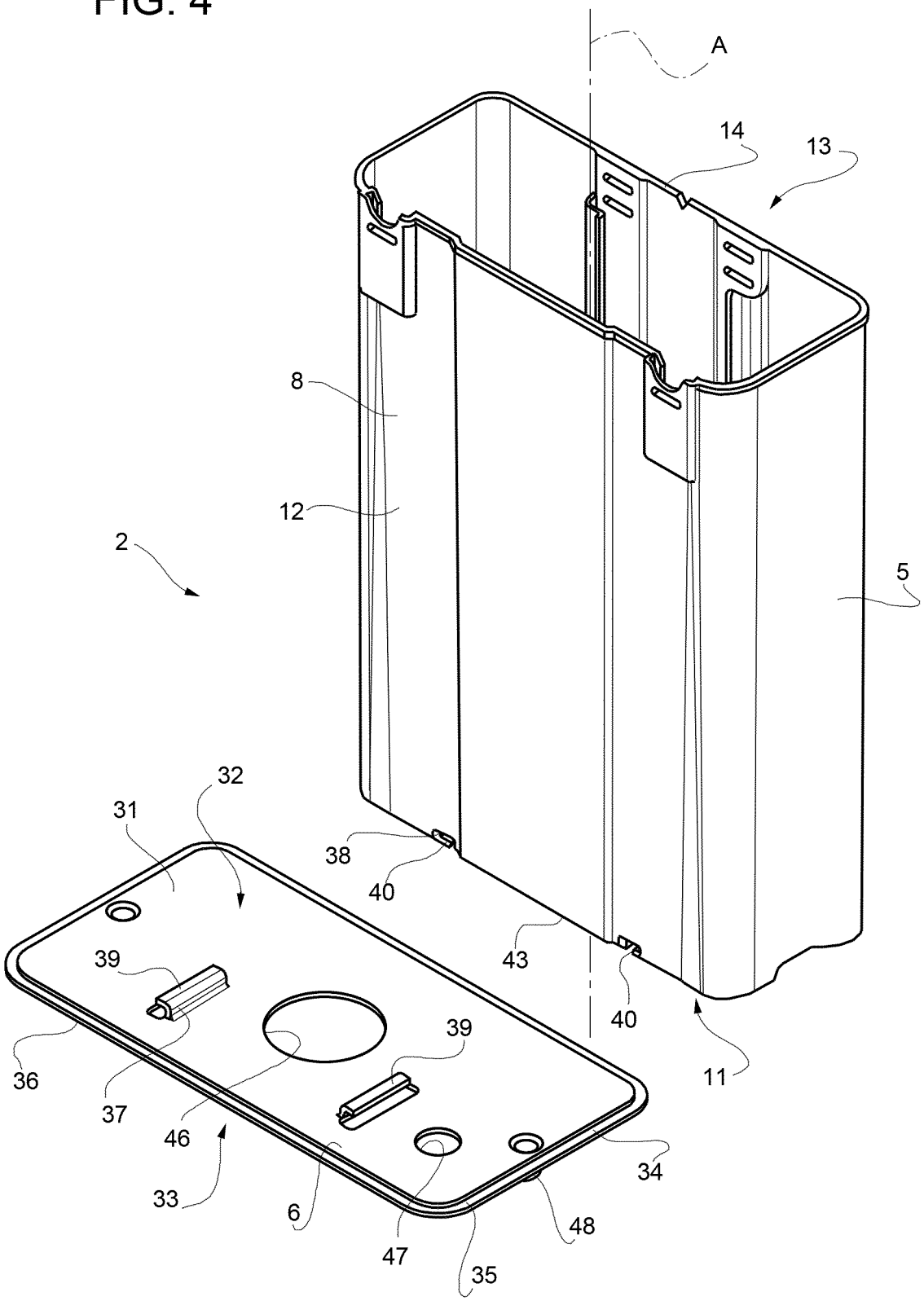
FIG. 4



Description

[0001] The present invention relates to a mounting system for mounting a flushing tank, in particular a ceramic flushing tank, on a support surface, in particular on a sanitary bowl; and a flushing tank fitted with such a mounting system.

[0002] A common type of flushing tank for sanitary appliances is that of the ceramic tank. Ceramic flushing tanks are normally intended to remain in view, not being recessed and concealed in a wall.

[0003] In some cases, ceramic flushing tanks are supported on a support surface, for example on a rear top edge of the sanitary bowl with which they form an integrated assembly both from the functional and aesthetic point of view.

[0004] It is therefore necessary to design and make specific flushing tanks for each sanitary bowl, with consequent complications and cost increases both in the production phase, and in the management and transport of products.

[0005] One purpose of this invention is to provide a mounting system for flushing tanks which, compared to the solutions of the prior art is equally, if not more, simple and versatile.

[0006] One particular purpose of the invention is to make it possible to fit flushing tanks having different aspects limiting the number of different components to be produced.

[0007] The present invention therefore relates to a mounting system for a flushing tank, in particular a ceramic flushing tank as defined in essential terms in the appended claim 1 and, in its additional features, in the dependent claims.

[0008] The invention also relates to a flushing tank, in particular a ceramic flushing tank, as defined in the appended claim 11.

[0009] The mounting system of the invention is particularly simple and versatile, making it possible to mount a flushing tank simply and quickly.

[0010] The invention also makes it possible to fit flushing tanks having different aspects, limiting the number of different components to produce, store and manage.

[0011] The invention is further described in the following non-limiting embodiment examples, with reference to the appended drawings wherein:

- Figure 1 is a perspective view from the front and above, partially in longitudinal cross-section, of a flushing tank fitted with a mounting system according to the invention;
- Figure 2 is a partially exploded perspective view from the front and above, of the flushing tank in figure 1;
- Figure 3 is a perspective view from the front and above, partially in longitudinal cross-section and with parts exploded and parts removed for clarity, of the flushing tank in Figure 1;
- Figure 4 is an exploded perspective view of the mounting system used in the flushing tank in Figure 1;
- Figures 5 and 6 show respective details of the flushing tank and mounting system in figure 1.

[0012] In Figure 1, reference numeral 1 globally denotes a flushing tank for a sanitary appliance.

[0013] In particular, the tank 1 is a ceramic flushing tank, meaning by this term a flushing tank having at least some visible portions (i.e. intended to remain visible in use; for example, as will be described in greater detail below, an outer casing) made of ceramic, or other similar valuable material.

[0014] The flushing tank 1 extends along an axis A (vertical in use) and comprises a mounting system 2 for mounting the flushing tank 1 on a support surface 3, in particular on a sanitary bowl 4 (shown schematically only in figure 1).

[0015] With reference also to figures 2, 3 and 4, the mounting system 2 comprises an inner cistern 5, configured to contain water, and a mounting flange 6 which, in use, engages the cistern 5 and provides support to an external casing 7, in particular a casing in ceramic or other valuable material, mounted outside the cistern 5 to cover the cistern 5.

[0016] The cistern 5 has an essentially tray-shaped body 8 (optionally with arched sides and/or rounded corners) which extends along the axis A and is preferably made of a polymeric material (plastic); in particular, the cistern 5 has a bottom wall 11 transverse to the axis A and a side wall 12 closed in a loop around the axis A and which juts out from the bottom wall 11. The cistern 5 has an upper open end 13 (axially opposite the bottom wall 11), delimited by a peripheral edge 14.

[0017] The cistern 5 is configured so as to house a flush valve 15 and a feed valve 16, in itself essentially known and not illustrated or described in detail for simplicity.

[0018] In general terms, the flush valve 15 comprises a support structure 17 which can be fixed to the cistern 5 and having a discharge hole 18 delimited by a sealing seat 19; a movable (sliding) shutter member 20 in the structure 17 cooperating with the sealing seat 19 to open / close the discharge hole 18; and an actuator mechanism 21 that moves the shutter member 20 and is controlled by a control unit 22. The control unit 22 comprises for example a hollow body 23, having a lower end portion 24 externally threaded which screws onto an upper end 25 of the structure 17 and houses one or two buttons acting on the actuator mechanism 21.

[0019] The feed valve 16, for example of the type with a tap controlled by a float, is connectable, via a joint 26, to an external water network to fill the cistern 5 after each flush of water performed by the flush valve 15.

[0020] The bottom wall 11 of the cistern 5 is provided with a through outlet hole 27 in which an end collar 28 of the flush valve 15 can be inserted; in particular, an end collar 28 of the support structure 17 of the flush valve 15

is through inserted in the hole 27; the collar 28 is provided with the discharge hole 18.

[0021] Optionally, the bottom wall 11 is also provided with an inlet hole 29 for the insertion of the joint 26 of the feed valve 16.

[0022] The hole 27 is preferably placed in the centre and/or along a centreline plane (parallel to the axis A) of the bottom wall 11, between two opposite side edges 30 of the bottom wall 11. The inlet hole 29 is arranged in an eccentric position or decentralised (i.e. shifted sideways) with respect to the hole 27, in the vicinity of one of the side edges 30.

[0023] The mounting flange 6 comprises or consists of a substantially flat plate 31 orthogonal to the axis A, preferably monolithic and made of polymeric material (plastic). The flange 6 has two opposite faces 32, 33 substantially flat and parallel and orthogonal to the axis A: an upper face 32 which is facing, in use, towards the cistern 5 and supports the cistern 5 and the casing 7; and a lower face 33 which is facing, in use, towards the bowl 4 and rests on the support surface 3 of the bowl 4.

[0024] The upper face 32 has at least one centering element 34 shaped so as to cooperate with the casing 7 for centering the casing 7 on the flange 6. For example, the centering element 34 consists of an annular groove 35 placed along a perimetrical edge 36 of the flange 6.

[0025] The flange 6 has, in the non-limiting example illustrated, a substantially rectangular plan shape with rounded corners, and thus the edge 36 too is substantially rectangular with rounded corners; it is understood that the flange 6 and the edge 36 may have different shapes (for example generally polygonal, possibly with rounded and/or chamfered sides and/or corners, or oval, elliptical, etc.).

[0026] The flange 6 and the cistern 5, specifically the bottom wall 11 of the cistern 5, are provided with respective fastening members 37, 38 cooperating with each other to engage axially (along the axis A), and preferably in a removable manner, the flange 6 to the cistern 5.

[0027] In particular, the fastening members 37, 38 cooperate to removably fix the cistern 5 to the upper face 32 of the flange 6 in a predetermined installation position, in which the bottom wall 11 of the cistern 5 rests on the upper face 32 of the flange 6 and the flange 6 protrudes laterally beyond the bottom wall 11 to provide support to the external casing 7.

[0028] For example, the fastening members 37, 38 respectively comprise a pair of teeth 39 projecting from the upper face 32 of the flange 6, and a pair of seats 40 formed on the bottom wall 11 and shaped so as to receive respective teeth 39.

[0029] With reference also to Figure 5, the teeth 39 are elongated longitudinally on the face 32 and have, for example, a substantially L-shaped cross section so as to present respective attachment surfaces 41 parallel to the face 32 and perpendicular to the axis A.

[0030] The seats 40 have respective front access openings 42 formed on a lower edge 43 of the side wall 11 of the cistern 5; and are closed at the rear (i.e. at the respective rear ends opposite the front access openings 42) by respective stop shoulders 44. The seats 40 have a shape matching the teeth 39 and have, in particular, respective attachment surfaces 45 parallel to the face 32 and cooperating axially (in a direction orthogonal to the axis A) with respective attachment surfaces 41 of the teeth 39.

[0031] The teeth 39 can be slidingly inserted in the seats 40 through the openings 42 until they stop against the shoulders 44, thereby attaching the cistern 5 on the flange 6 in a predetermined installation position.

[0032] The flange 6 is provided with a main hole 46, placed substantially centrally on the flange 6 through the flange 6, and, optionally, with an auxiliary lateral hole 47, located in the proximity of a side of the flange 6 through the flange 6.

[0033] When the flange 6 is mounted on the cistern 5 in the installation position, the holes 46, 47 are aligned parallel to the axis A to the outlet hole 27 and the inlet hole 29 of the cistern 5 respectively, so that, in use, the end collar 28 of the flush valve 15 is inserted through the outlet hole 27 of the cistern 5 and the main hole 46 of the flange 6, and the joint 26 of the feed valve 16 is inserted through the inlet hole 29 of the cistern 5 and the auxiliary hole 47 of the flange 6.

[0034] With reference also to Figure 6, the flange 6 is also equipped with positioning members 48 for positioning the flange 6 in a predetermined position on the bowl 4, and precisely on the support surface 3.

[0035] For example, the positioning members 48 comprise a pair of pins 49 that protrude from the lower face 33 of the flange 6 and are located at respective lateral ends of the flange 6 to engage respective centering seats 50 formed in the bowl 4.

[0036] The casing 7 (figures 1, 2) comprises or consists of a hollow, inverted-cup shell 51, preferably monolithic and for example made of ceramic or other valuable material, having a shape and dimensions such as to cover the inner cistern 5.

[0037] In particular, the casing 7 extends along the axis A between an open lower end 52, provided with a contact edge 53 formed so as to cooperate with the centering element 34 and in particular as to engage the groove 33 of the flange 6; and a top end 54 closed by an end wall 55 transverse to the axis A. The casing 7 has a side wall 56 closed in a loop around the axis A; the wall 56 extends from the end wall 55 and terminates with the contact edge 53. The wall 55 is provided with a through-hole 57 which houses the control unit 22.

[0038] Preferably, the lower end 52 of the casing 7 has a cross section slightly larger than the flange 6, so that the edge 53 protrudes laterally beyond the perimetrical edge 36 of the flange 6.

[0039] The mounting system 2 is used to mount the flushing tank 1 on the sanitary bowl 4.

[0040] The cistern 5 and the flange 6 are made as separate pieces and then assembled together, for example

at the factory before shipment to retailers or installers or other users. It is thus possible to make various different flanges 6, having different dimensions and/or forms, to associate with different cisterns 5.

[0041] To mount the flange 6 on the cistern 5, the bottom wall 11 of the cistern 5 is laid on the upper face 32 of the flange 6 and the teeth 39 aligned with the respective access openings 42 and inserted in the respective seats 40, making the teeth 39 slide up against the shoulders 44.

[0042] Then, the flush valve 15 and the feed valve 16 can be mounted in the cistern 5 by inserting the collar 28 of the flush valve 15 through the outlet hole 27 of the cistern 5 and the main hole 46 of the flange 6; and inserting the joint 26 of the feed valve 16 through the inlet hole 29 of the cistern 5 and the auxiliary hole 47 of the flange 6.

[0043] To block the flush valve 15 and the feed valve 16 respective threaded ring-nuts 58, 59 (figure 3) are used which engage respective threaded outer portions 60, 61 of the collar 28 and of the joint 26, projecting axially outside the cistern 5 and beyond the flange 6 and precisely beyond the lower face 33 of the flange 6.

[0044] The outer casing 7 is then mounted on the flange 6 to cover the inner cistern 5. The casing 7 is fitted from above around the cistern 5 until it rests, on its edge 53, on the flange 6; in particular, the edge 53 engages the groove 35, ensuring the centering of the casing 7.

[0045] Lastly, the casing 7 is blocked at the top by the control unit 22, which is inserted through the hole 57, abuts axially against the wall 55 and is screwed onto the structure 17. This way, the casing 7 remains axially blocked between the ring nut 58 and the body 23 of the control unit 22.

[0046] The flange 6 also performs a protection function of the casing 7 during storage and transport.

[0047] Thus, when the flushing tank 1 is mounted on the sanitary appliance, the flange 6 is interposed between the bowl 4 and the flushing tank 1; precisely, the flange 6 is interposed both between the bowl 4 and the cistern 5, and between the bowl 4 and the casing 7.

[0048] The flushing tank 1 described above is advantageously part of a mounting system of a flushing tank in which a single cistern 5 can be used with a flange 6 selected from a plurality of different flanges for mounting different casings 7 on bowls also possibly different from one another.

[0049] The system thus includes a cistern 5 (meaning thereby cisterns 5 all made the same as one another), and a series of flanges 6 different from each other but all having fastening members 37 suitable to engage the cistern 5 (i.e. respective batches of flanges 6, each batch being of identical flanges different from the flanges of the other batches).

[0050] The flanges 6 of the various batches differ for example in shape, size, proportions, position of the positioning members 48, and so on.

[0051] The flanges 6 of each batch (all the same as each other) have positioning members 48 shaped and located so as to engage the centering seats 50 of the casings 7 which the cistern 5 is to be fitted with.

[0052] This way it is possible to use the same cistern 5 on various sanitary appliances, changing only the mounting flange 6, and thus adapt the cistern 5 to casings 7 different from each other.

[0053] The system thus also includes a series of casings 7 (i.e. respective batches of casings 7, each batch being formed of identical casings) different from each other and provided with centering seats 50 arranged to receive the positioning members 48 of at least one type of flange 6.

[0054] It is however understood that the system may also comprise a series of cisterns 5 (i.e. batches of cisterns 5) different from each other in shape and/or size but all having fastening members 38 suitable to cooperate with the fastening members 37 of the flanges 6.

[0055] Lastly, it is understood that further modifications and variations may be made to the mounting system and flushing tank described and illustrated herein while remaining within the scope of the appended claims.

Claims

1. A mounting system (2) for a flushing tank (1), in particular a ceramic flushing tank; the mounting system (2) comprising an inner cistern (5), extending substantially along an axis (A) and configured for containing water and housing a flush valve (15); and a mounting flange (6); the flange (6) and the cistern (5) being provided with respective fastening members (37, 38) cooperating with one another for removably fixing the cistern (5) onto an upper face (32) of the flange (6) in a predetermined installation position, in which a bottom wall (11) of the cistern (5) rests on the upper face (32) of the flange (6) and the flange (6) projects laterally beyond the bottom wall (11) for providing support to an outer casing (7), in particular a casing made of ceramic or another valuable material, which can be fitted outside the cistern (5) to cover the cistern (5).

2. A mounting system according to claim 1, wherein the fastening members (37, 38) comprise a pair of teeth (39) projecting from the upper face (32) of the flange (6), and a pair of seats (40) formed on the bottom wall (11) of the cistern (5) and shaped so as to receive respective teeth (39) and axially hook the teeth (39).

3. A mounting system according to claim 2, wherein the seats (40) have respective front access openings (42), formed on a lower edge (43) of a lateral wall (12) of the cistern (5); and are closed at the back by respective stop shoulders (44); the teeth (39) being slidable in the seats (40) through the openings (42) up to stop against the shoulders (44).

4. A mounting system according to one of the preceding claims, wherein the flange (6) is provided with a main through hole (46) which is aligned, when the cistern (5) and the flange (6) are in the installation position, with an outlet hole (27) formed through the bottom wall (11) of the cistern (5) for receiving an end collar (28) of a flush valve (15).

5. A mounting system according to claim 4, wherein the flange (6) is provided with a lateral auxiliary hole (47), positioned eccentrically with respect to the main hole (46) and aligned, when the cistern (5) and the flange (6) are in the installation position, with an inlet hole (29) formed through the bottom wall (11) of the cistern (5) for receiving a joint (26) of a feed valve (16).

6. A mounting system according to one of the preceding claims, wherein the upper face (32) of the flange (6) has at least one centering element (34) shaped so as to cooperate with the casing (7) for centering the casing (7) on the flange (6).

7. A mounting system according to one of the preceding claims, wherein the upper face (32) of the flange (6) has an annular groove (35), positioned along a perimetrical edge (36) of the flange (6).

8. A mounting system according to one of the preceding claims, wherein the flange (6) is provided with positioning members (48) projecting from a lower face (33) of the flange (6) and shaped so as to engage respective centering seats (50) formed on a support surface (3), in particular of a sanitary bowl (4).

9. A mounting system according to one of the preceding claims, comprising an outer casing (7), in particular a casing made at least partly of ceramic or another valuable material, shaped so as to be mounted outside the cistern (5) to cover the cistern (5).

10. A mounting system according to one of the preceding claims, comprising one cistern (5) and a series of flanges (6) different from one another but all having fastening members (37) apt to fasten the cistern (5).

11. A flushing tank (1) for a sanitary appliance, in particular a ceramic flushing tank, comprising a mounting system (2) according to one of the preceding claims for mounting the tank (1) onto a support surface (3), in particular on a sanitary bowl (4).

FIG. 1

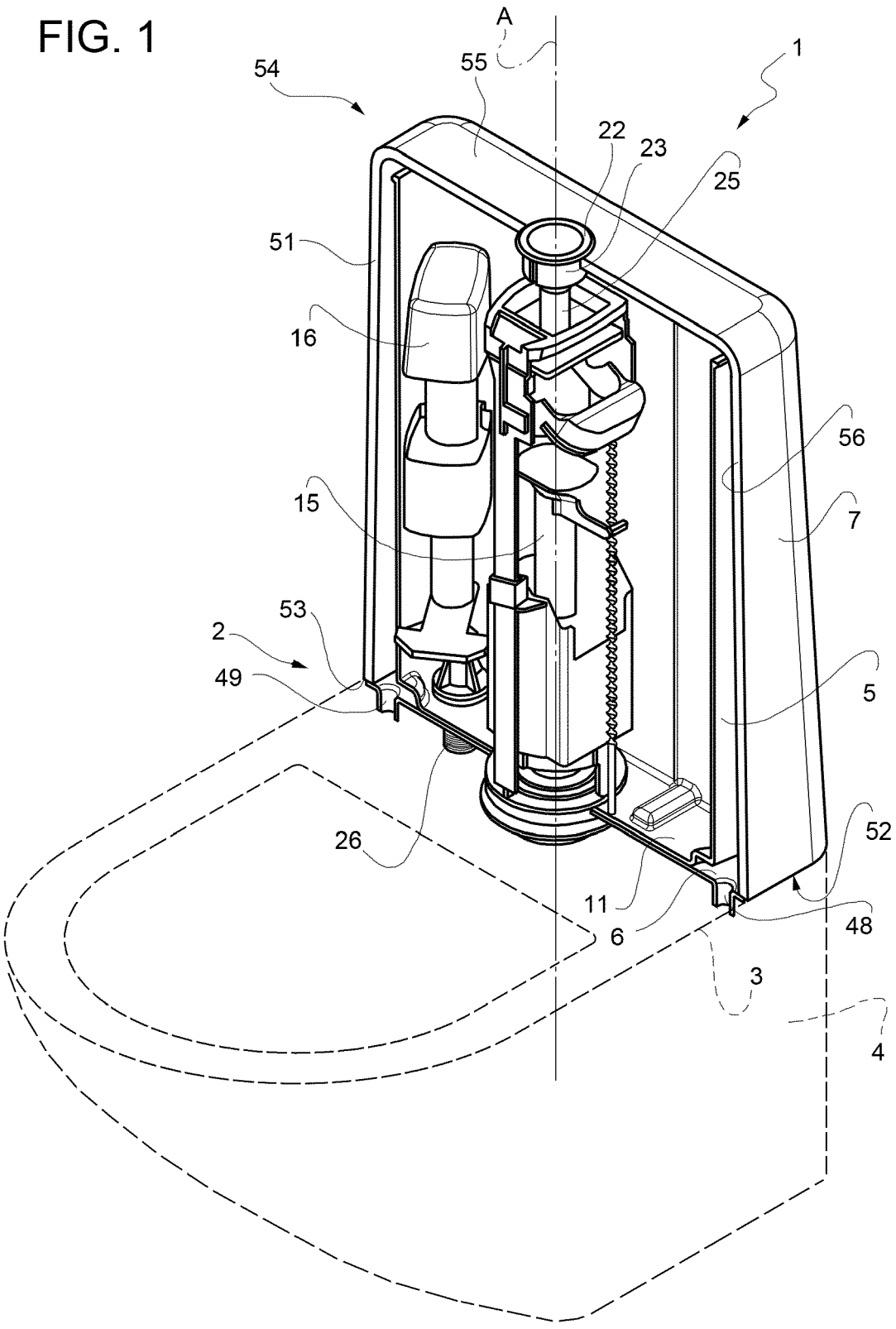


FIG. 2

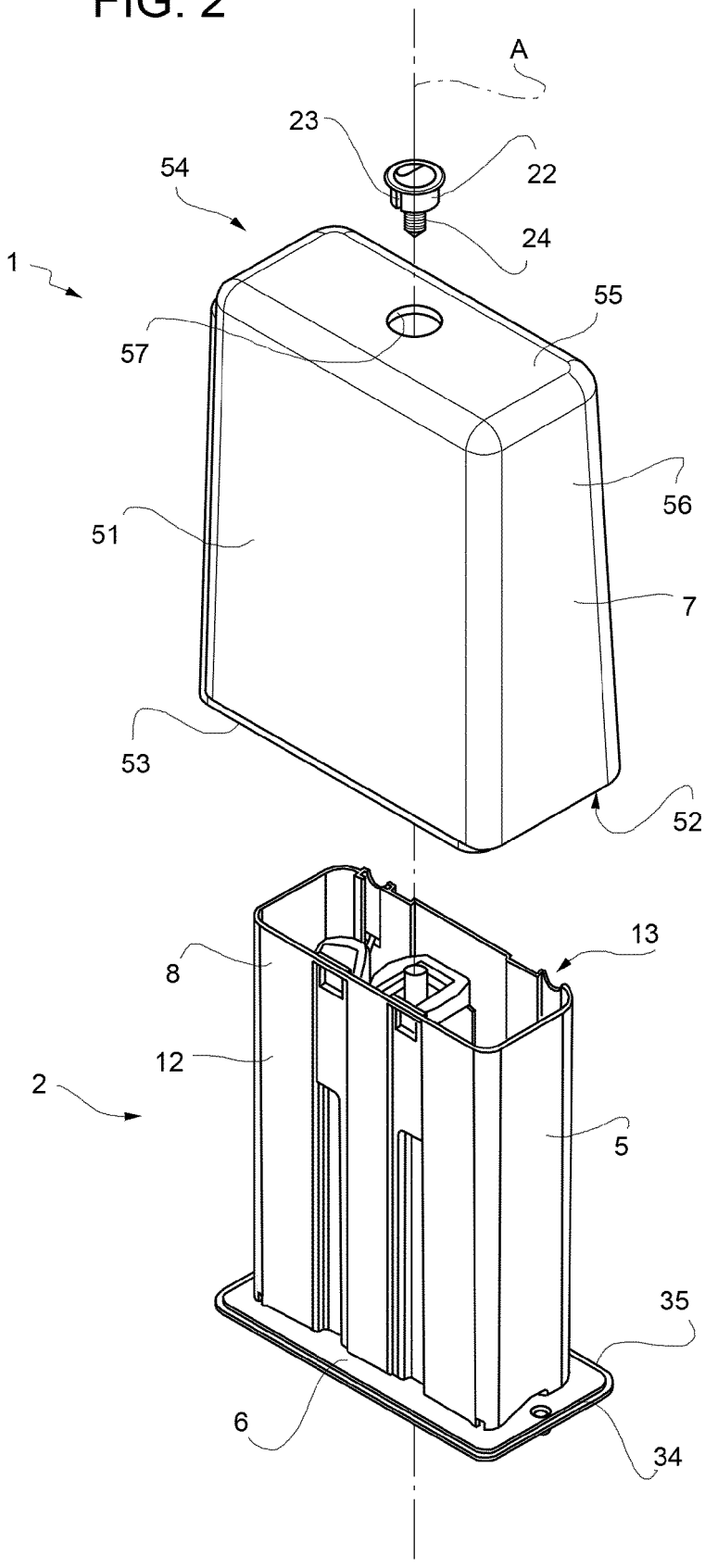


FIG. 3

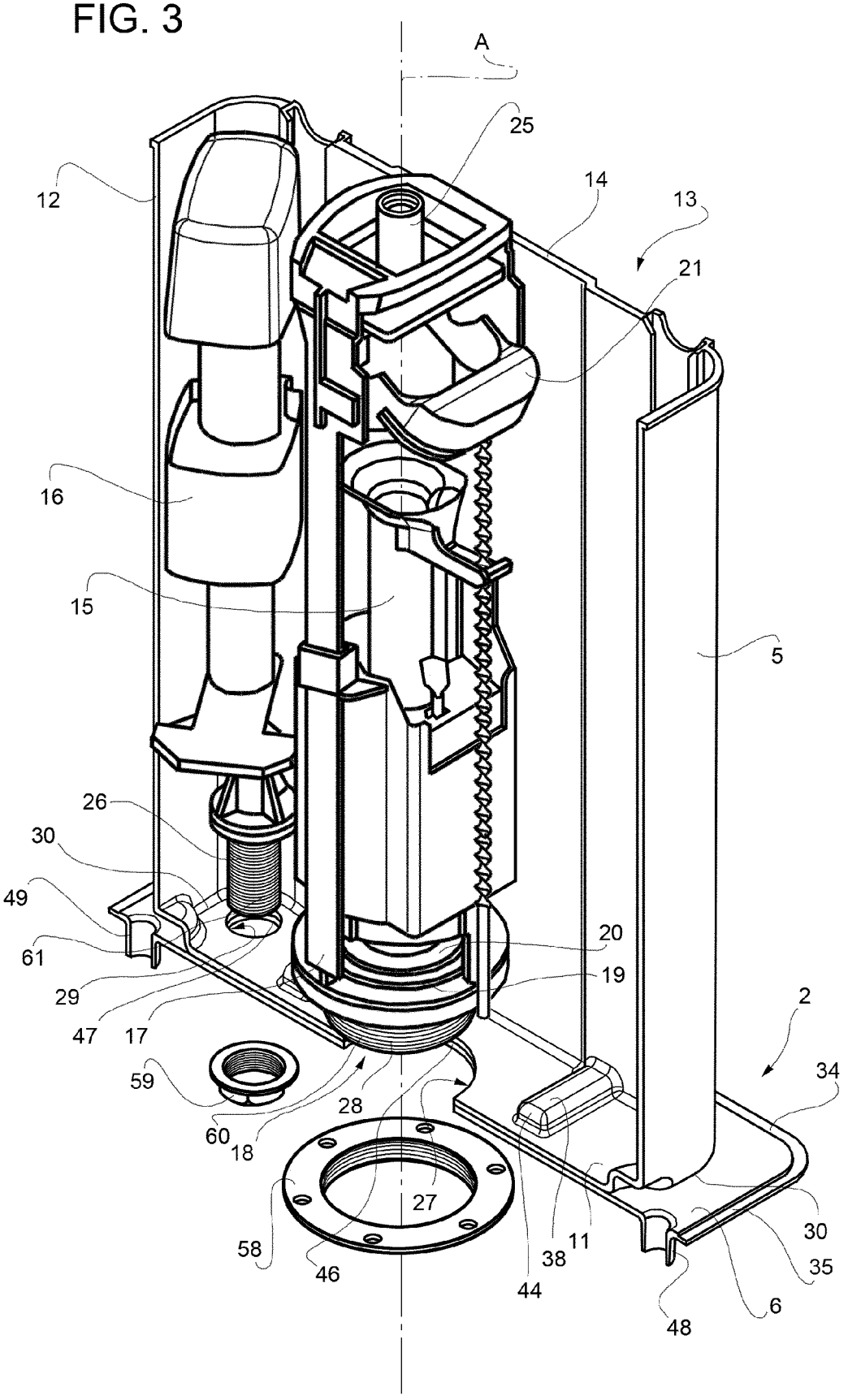

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FIG. 4

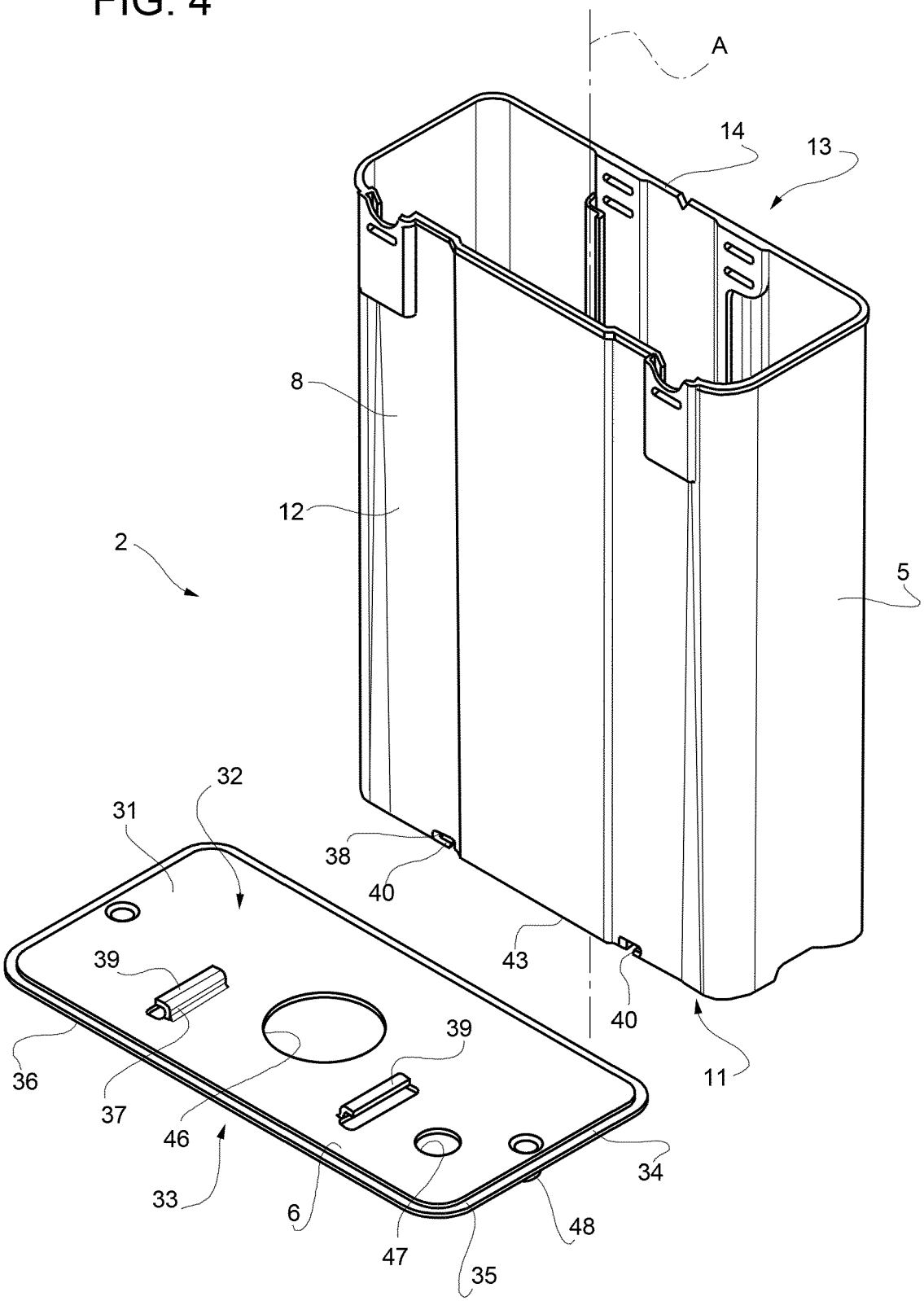


FIG. 5

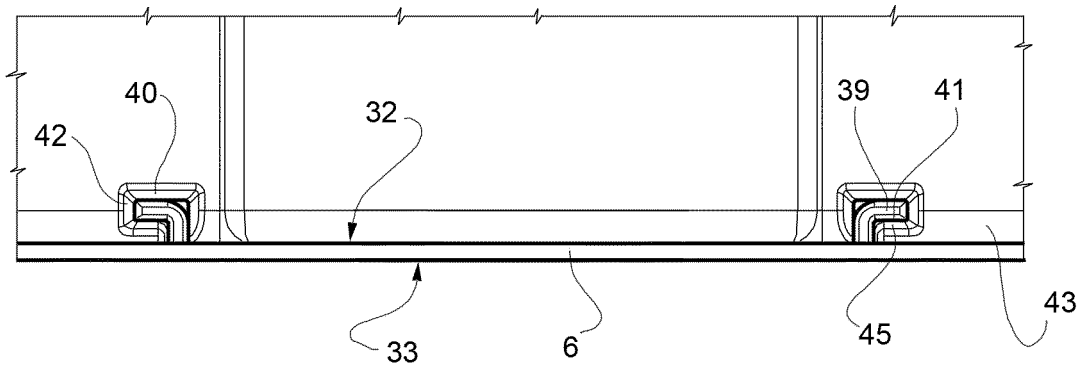
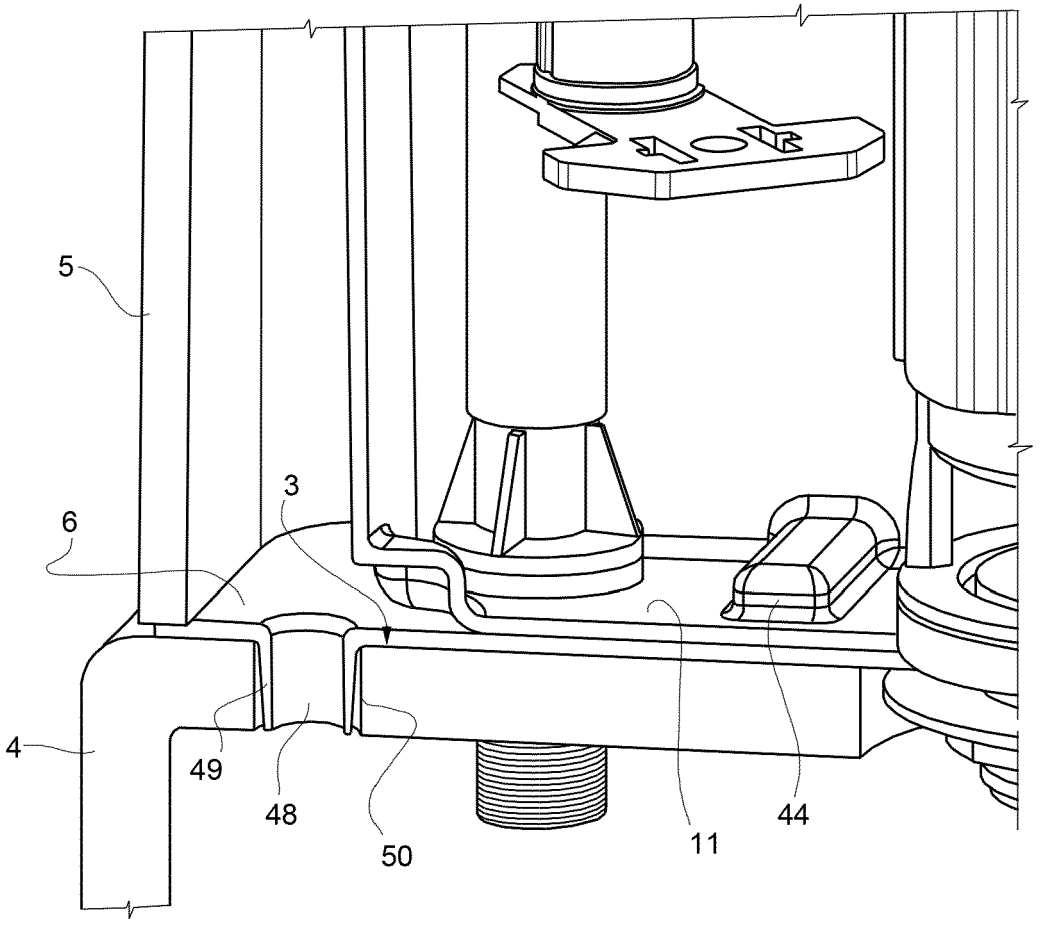


FIG. 6



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EUROPEAN SEARCH REPORT

Application Number
EP 16 18 1812

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	10 October 2016	Isailovski, Marko

CATEGORY OF CITED DOCUMENTS

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