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(54) **CISTERN FOR A FLUSHING TANK**

(57) A cistern (2) for a flushing tank, in particular for a ceramic flushing tank, comprises a body (4) substantially in the shape of a bowl to contain water; a plate (8) positioned at a lower end (5) of the body (4) and having a radially outer flange (15) ; and a distributor (20), which projects from the plate (8) and comprises a central collar (21), closed by a cap (22), and a pair of opposite tubular arms (23) extending laterally from the collar (21); the body (4), the plate (8) with the flange (15), and at least one upper part (30) of the distributor (20) form a single monolithic piece (41); whereas a lower part (31) of the distributor (20) consists of a further piece (42), also preferably monolithic, joined to the upper part (30) by a mechanical fastening system (32).

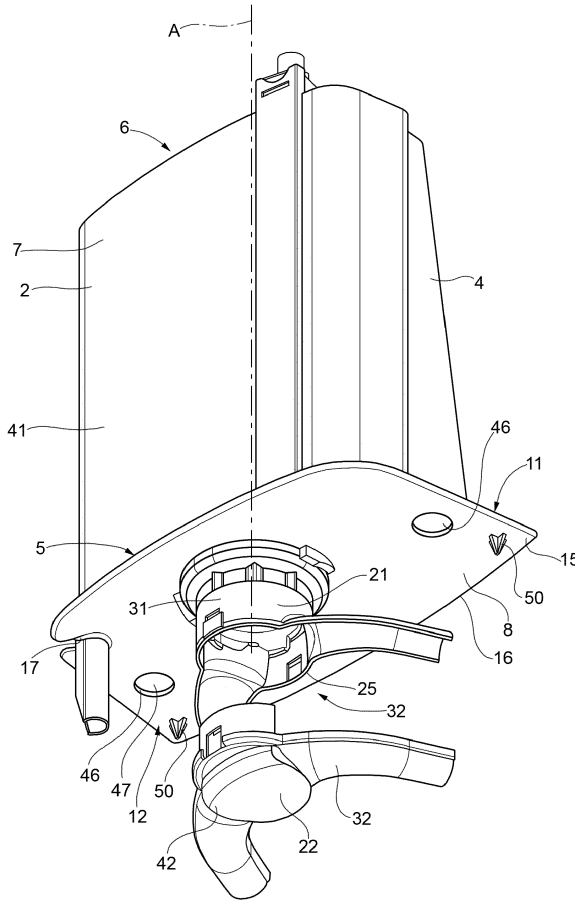

FIG. 2

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Description

[0001] The present invention relates to a cistern for a flushing tank, in particular for a ceramic flushing tank; and to a flushing tank, in particular a ceramic flushing tank, provided with said cistern.

[0002] Ceramic tanks are common types of flushing tanks for sanitary appliances. Ceramic flushing tanks are normally intended to remain in sight, not being built-in or concealed in a wall.

[0003] In some cases, ceramic flushing tanks rest on a support surface, for example on the rear upper edge of a sanitary bowl, and are connected to a drain distributor that takes the water discharged from the flushing tank to the sanitary bowl.

[0004] Therefore, specific flushing tanks must be designed and constructed for each sanitary bowl, with consequent complications and increases in costs both in the manufacturing stage and in the product management and transport stage.

[0005] Moreover, the tank is rested on, and fixed to, the bowl by means of suitable elements, for example plates or flanges having fastening members; these elements typically consist of separate pieces.

[0006] Usually, the distributor also consists of a further separate component, possibly made up of several pieces, which must be mounted on the flushing tank, i.e. connected to a drain hole of the flushing tank.

[0007] Consequently, according to the prior art, several components must be manufactured and assembled even during the installation stage of the flushing tank.

[0008] On the other hand, it is not normally possible to manufacture a number of components together to form monolithic pieces, given the particular shape that at least some of the components, such as the distributor, must have.

[0009] An object of the present invention is to provide flushing tanks, particularly made of ceramic, which are more simple and less expensive to construct and install compared to the prior art.

[0010] In particular, it is an object of the invention to provide a cistern for a flushing tank which, compared to the solutions of the prior art, is particularly easy to implement and extremely versatile, and allows the flushing tank to be assembled and fitted in place in a simple and quick way.

[0011] Therefore, the present invention relates to a cistern for a flushing tank, in particular for a ceramic flushing tank, as defined essentially in the appended claim 1 and, in its additional features, in the dependent claims.

[0012] The invention also relates to a flushing tank, in particular a ceramic flushing tank, provided with said tank, as defined in the appended claim 14.

[0013] Thus, the invention provides a cistern for a flushing tank which, compared to the solutions of the prior art, is not only particularly simple to manufacture and assemble, but is also extremely versatile, allowing flushing tanks to be assembled and installed in a simple and quick way, also obtaining various aesthetic aspects with a reduced number of components.

[0014] The invention is further described in the following, non-limiting, implementation examples, with reference to the accompanying figures in which:

- Figure 1 is a rear-bottom perspective view of a flushing tank equipped with a cistern according to the invention;
- Figure 2 is a rear-bottom perspective, and partially exploded, view of the cistern in Figure 1;
- Figure 3 is a view in longitudinal section of a detail of the cistern in Figure 1;
- Figure 4 is a front view of a detail of the cistern in Figure 1;
- Figure 5 is a view in enlarged scale of the detail highlighted in Figure 4.

[0015] The numeral 1 in Figure 1 shows, as a whole, a flushing tank for a sanitary appliance.

[0016] The tank 1 extends along an axis A (vertical in use) and comprises an inner cistern 2, configured to contain water, and an outer casing 3, for example a ceramic casing, mounted on the outside of the cistern 2, covering the cistern 2 and possibly interchangeable with another casing (different in shape, appearance, finishing, etc.).

[0017] Also with reference to Figures 2-5, the cistern 2 has a body 4 essentially in the shape of a bowl (optionally with curved sides and/or rounded edges) which extends along the axis A between a lower end 5 and an upper end 6. In particular, the cistern 2 has a side wall 7 closed in a loop around the axis A; and a lower-end plate 8, located at the lower end 5 and transversal to the axis A and to the side wall 7. The lower end 5 is closed by the plate 8, which acts as the bottom wall of the cistern 2; the upper end 6 is open.

[0018] The cistern 2 is configured so as to accommodate a drain valve and a supply valve, essentially known per se and not shown for simplicity.

[0019] The plate 8 has an upper face 11, facing the cistern 2, and a lower face 12, opposite the upper face 11. The plate 8 comprises a central part 13, which forms the bottom wall of the cistern 2 and is provided with a through hole 14 communicating with the interior of the cistern 2; and a radially outer flange 15, arranged around the central part 13.

[0020] The flange 15 is substantially perpendicular to the axis A and projects laterally around the side wall 7. In particular, the flange 15 has a radially outer peripheral edge 16 which projects all around the lower end 5 of the cistern 2.

[0021] Optionally, the plate 8 is also provided with an auxiliary hole 17 for insertion of a fitting of the supply valve, for instance, arranged in an eccentric or decentralised position (i.e. laterally shifted) with respect to the hole 14, in particular on the flange 15.

[0022] The cistern 2 is provided with a distributor 20,

which projects from the plate 8 and comprises a central collar 21, which projects from the face 12 around the hole 14 and is closed by a cap 22, and a pair of opposite tubular arms 23, which extend from the collar 21 and define internally respective conduits.

[0023] In particular, the collar 21 has a root edge 24, joined to the face 12 of the plate 8, and a free-end edge 25, which is closed by the cap 22; the arms 23 are curved and project from an outer side wall 26 of the collar 21 from opposite sides of the collar 21; the wall 26 is provided with a pair of openings 27 communicating with the conduits defined inside the arms 23.

[0024] Advantageously, the distributor 20 is made of two distinct parts 30, 31, constituted by respective pieces manufactured separately and joined together by a mechanical fastening system 32: an upper part 30 and a lower part 31.

[0025] The upper part 30 comprises the collar 21 and a first pair of curved half-shells 33 which project laterally from the collar 21 and define respective upper portions of the arms 23.

[0026] The lower part 31 comprises the cap 22, shaped so as to close the collar 21, and a second pair of curved half-shells 34 which project laterally from the cap 22 and define respective lower portions of the arms 23; the upper half-shells 33 and the lower half-shells 34 being shaped so as to match and join along respective lateral joining edges 35 to form the tubular arms 23; for example, the half-shells 33, 34 have a substantially U-shaped cross section. Each half-shell 33 has a pair of side edges 35 facing respective lateral edges 35 of an opposite half-shell 34.

[0027] The mechanical fastening system 32 comprises pairs of fastening members 36, 37, in particular snap-on fastening members, carried by the parts 30, 31, respectively, and cooperating to fasten the parts 30, 31 to each other.

[0028] In particular, the fastening members 36, 37 comprise opposed teeth carried by the parts 30, 31 and shaped so as to engage with one another axially, i.e. in a direction that is substantially parallel to the axis A, subject to radial elastic deformation, i.e. in a direction substantially transverse to the axis A.

[0029] In the non-limiting example shown, the fastening members 36 on the part 30 comprise a pair of teeth 36a arranged on the collar 21, and additional pairs of teeth 36b located on the half-shells 33, along the edges 35.

[0030] The corresponding fastening members 37 on the part 31 comprise a pair of teeth 37a arranged on a peripheral edge of the cap 22 and which engage the teeth 36a to fasten the cap 22 to the collar 21; and further pairs of teeth 37b located on the half-shells 34 along the edges 35 and which engage the teeth 36b to fasten the half-shells 33, 34.

[0031] Preferably, the teeth 36a, 36b are at diametrically opposite positions on the collar 21 and on the cap 22 between the arms 23.

[0032] Preferably, then, the teeth 36b, 37b are shaped as continuous ridges longitudinally elongated along the edges 35. In particular, the teeth 36b are defined by respective longitudinal ridges which project from the half-shells 33 along the respective edges 35 and radially protrude outside the half-shells 33; the teeth 36b are inserted in respective grooves 38 formed along the edges 35 of the lower half-shells 34; the teeth 37b are in turn defined by longitudinal ridges which project from respective outer side edges of the grooves 38 to engage the teeth 36b.

[0033] Advantageously, the cistern 2 (i.e. the body 4), the plate 8 and the upper part 30 of the distributor 20 form a single monolithic piece 41, for example made of polymeric material (plastic); whereas the lower part 31 of the distributor 20 consists of an additional piece 42, also preferably monolithic, distinct and separate, i.e. manufactured separately, for instance again in polymeric material (plastic), and then joined to the piece 41.

[0034] The collar 21 internally houses (Figure 4) an end sleeve 43 of a support structure 44 of the drain valve; the sleeve 43 is arranged through the hole 14 and in turn has a hole 45 that defines a drain hole of the drain valve and is delimited by a cooperating sealing seat in use with a stopping of the drain valve.

[0035] The flange 15 of the plate 8 provides a support to the outer casing 3 and is used to place the cistern 2 on a support surface, for example on a sanitary bowl (not shown).

[0036] The flange 15 is provided with at least one centring member 46 shaped so as to cooperate with the casing 3 to centre the casing 3 on the flange. For example, the flange 15 has a pair of through holes 47 which receive respective pins 48 which extend downward from the casing 3.

[0037] The casing 3, only shown schematically in Figure 1, is shaped, for example, like a hollow shell 49, is preferably monolithic and for example made of ceramic or other valuable material, with a shape and size such as to cover the cistern 2 (which is housed inside the casing 3) and to rest, with its own lower end edge, on the flange 15.

[0038] The flange 15 (or the plate 8) is also provided with positioning members 50 for positioning the plate 8 (and hence the cistern 2) in a predetermined position on the support surface (sanitary bowl). For example, the positioning members 50 comprise a pair of pins which extend from the lower face 12 of the plate 8 and are located at respective lateral ends of the flange 15 to engage respective seats formed in the support surface.

[0039] Lastly, it is understood that the cistern and the flushing tank as described and illustrated herein can be subject to modifications and variations without departing from the scope of the accompanying claims.

Claims

1. A cistern (2) for a flushing tank, in particular for a

ceramic flushing tank, comprising a body (4) substantially in the shape of a bowl for containing water; a plate (8) positioned at a lower end (5) of the body (4) and having a radially outer flange (15) projecting laterally about a lateral wall (7) of the body (4); and a distributor (20), which projects from the plate (8) and comprises a central collar (21), closed by a cap (22), and a pair of opposite tubular arms (23) extending laterally from the collar (21); wherein the body (4), the plate (8) with the flange (15), and at least one upper part (30) of the distributor (20) form a single monolithic piece (41).

2. A cistern according to claim 1, wherein the distributor (20) is made of an upper part (30), which is part of said monolithic piece (41), and at least one lower part (31) joined to the upper part (30) by a mechanical fastening system (32).

3. A cistern according to claim 2, wherein the upper part (30) comprises the collar (21) and a first pair of curved upper half-shells (33) which project laterally from the collar (21) and define respective upper portions of the arms (23); and the lower part (31) comprises the cap (22), shaped so as to close the collar (21), and a second pair of curved lower half-shells (34) which project laterally from the cap (22) and define respective lower portions of the arms (23); the upper half-shells (33) and the lower half-shells (34) being shaped so as to match and join along respective lateral joining edges (35) to form the arms (23).

4. A cistern according to claim 2 or 3, wherein the upper half-shells (33) and the lower half-shells (34) have a substantially U-shaped cross section.

5. A cistern according to one of claims 2 to 4, wherein the mechanical fastening system (32) comprises fastening members (36, 37) carried by the upper part (30) and by the lower part (31), respectively, and cooperating to fasten the upper part (30) and the lower part (31) to each other.

6. A cistern according to claim 5, wherein the fastening members (36, 37) are snap-on fastening members.

7. A cistern according to claim 6, wherein the fastening members (36, 37) comprise opposite teeth carried by the upper part (30) and by the lower part (31), respectively, and shaped so as to engage with one another axially, i.e. in a direction substantially parallel to the axis (A), subject to radial elastic deformation, i.e. in a direction substantially transverse to the axis (A).

8. A cistern according to claim 7, wherein the fastening members (36, 37) comprise first teeth (36a, 37a) arranged on the collar (21) and on the cap (22) and cooperating to fasten the cap (22) to the collar (21).

9. A cistern according to claim 8, wherein the first teeth (36a, 37a) are arranged in pairs at diametrically opposite positions on the collar (21) and the cap (22) between the arms (23).

10. A cistern according to one of claims 7 to 9, wherein the fastening members (36, 37) comprise second teeth (36b, 37b) positioned on the upper half-shells (33) and the lower half-shells (34) along the respective lateral joining edges (35) and cooperating to fasten the upper half-shells (33) and the lower half-shells (34).

11. A cistern according to claim 10, wherein the second teeth (36b, 37b) are shaped as continuous ridges longitudinally elongated along the lateral joining edges (35).

12. A cistern according to claim 11, wherein the second teeth (36b, 37b) are defined by first longitudinal ridges which project from the upper half-shells (33) along the respective lateral joining edges (35) and radially protrude outside the upper half-shells (33) and are inserted in respective grooves (38) formed along the lateral joining edges (35) of the lower half-shells (34); and by second longitudinal ridges which project from respective outer lateral edges of the grooves (38).

13. A cistern according to one of the preceding claims, wherein the flange (15) is provided with positioning members (50) for positioning the plate (8) and hence the cistern (2) in a predetermined position on a support surface, for example on a sanitary bowl.

14. A flushing tank (1) for a sanitary appliance, in particular a ceramic flushing tank, comprising a cistern (2) according to one of the preceding claims, and an outer casing (3), fitted outside the cistern (2) to cover the cistern (2) and possibly interchangeable with another casing.

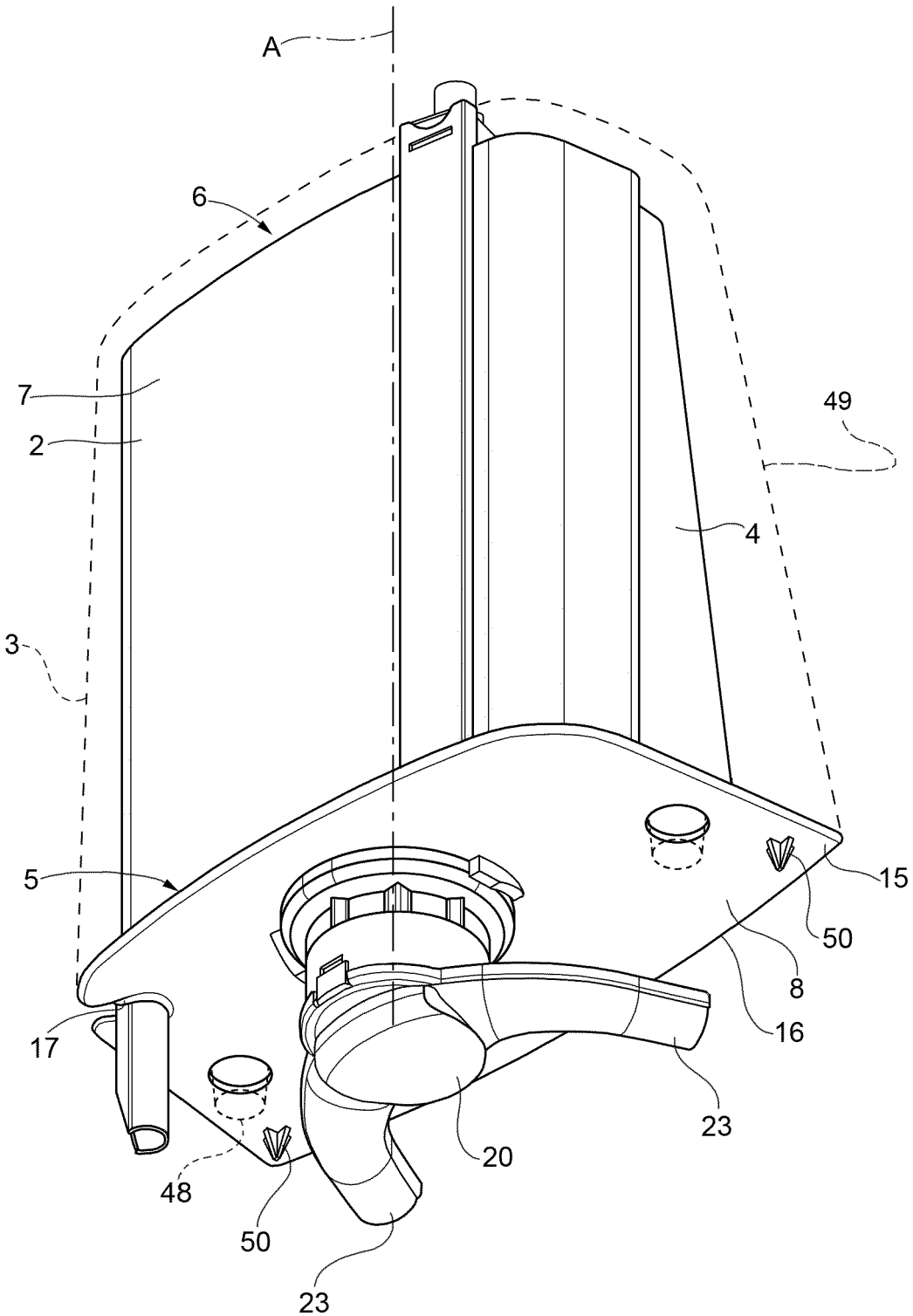

FIG. 1

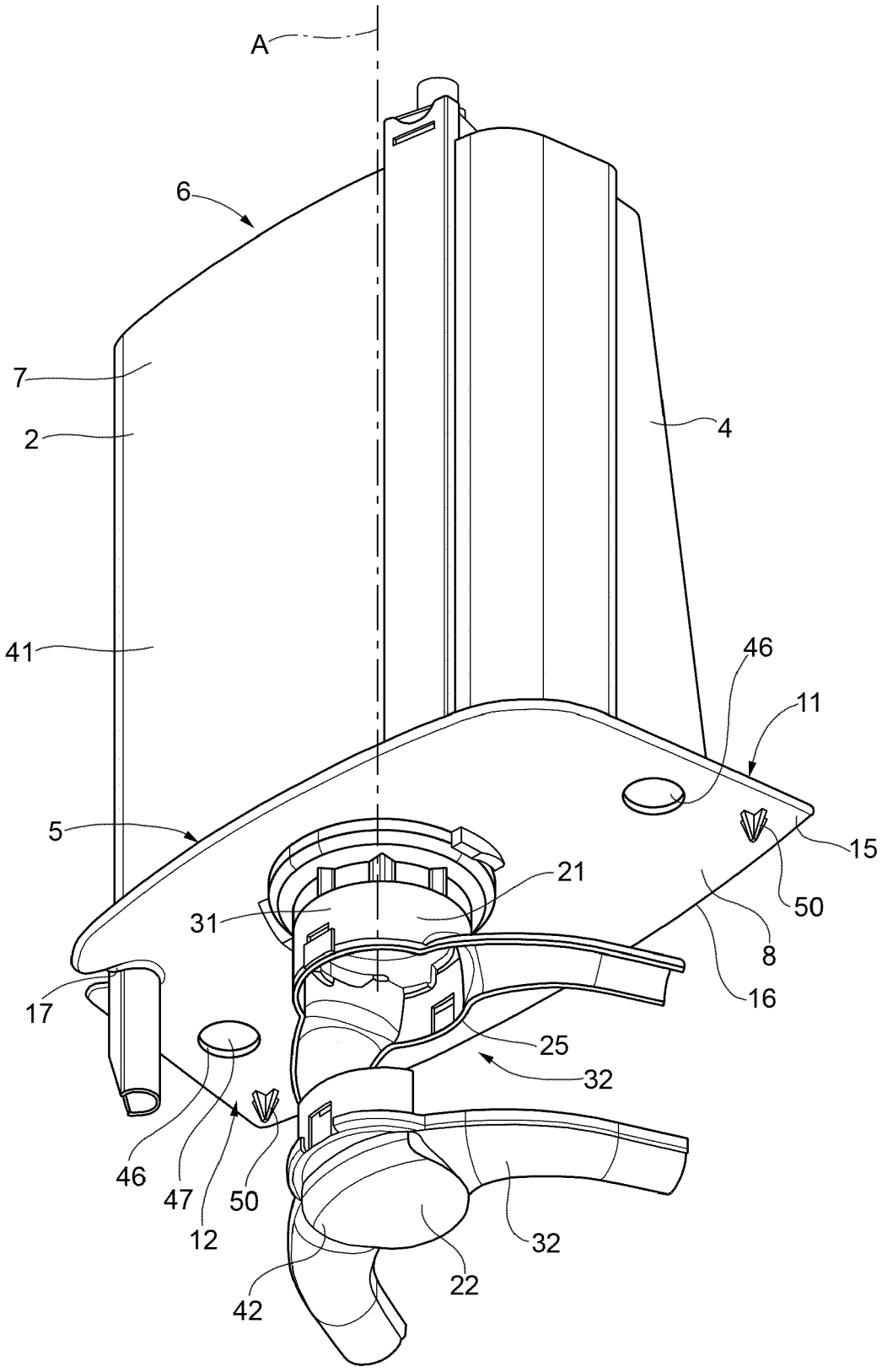

FIG. 2

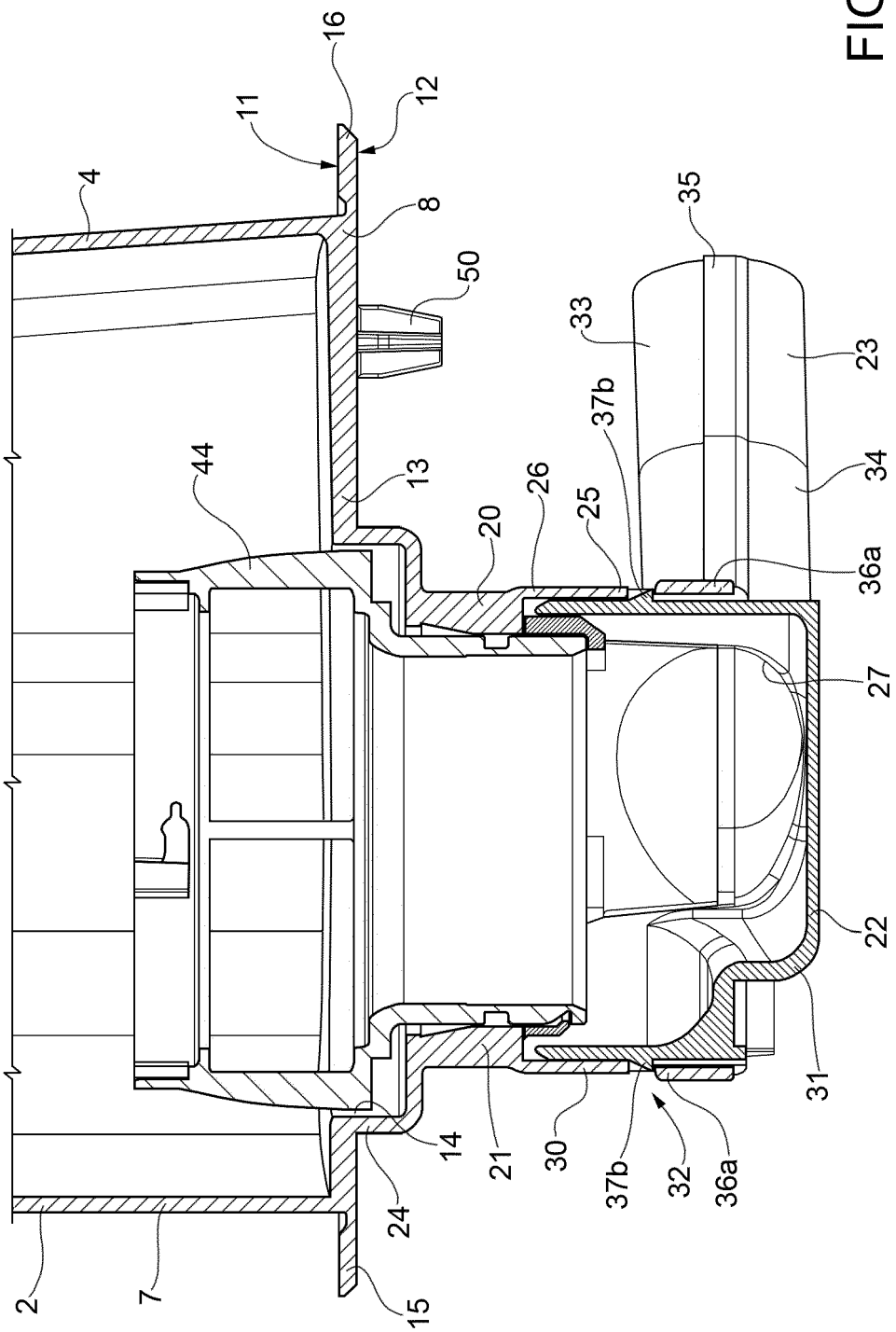
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FIG. 3

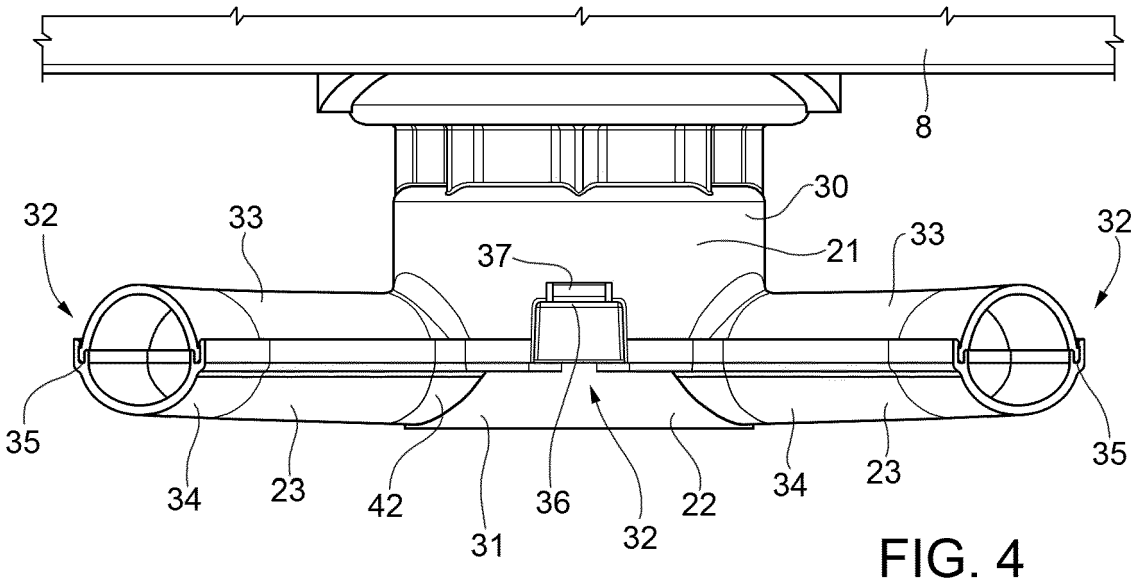
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FIG. 4

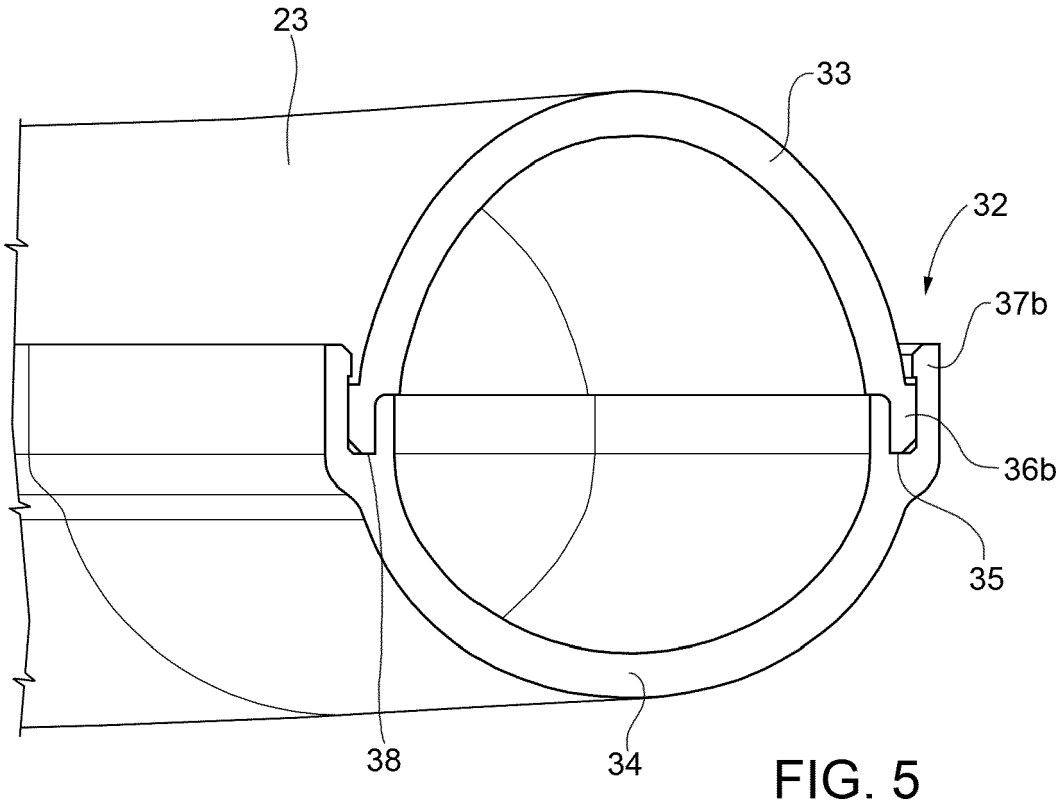
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FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 16 19 0179

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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	18 January 2017	Leher, Valentina

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