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(54) CISTERN DOUBLE-FLUSH DEVICE

(57) It comprises in principle a pushbutton that when pressing on it an overflow of a flush system is raised upwards, causing the flush of the tank through a curb attached at the bottom of such tank. The pushbutton is linked to the overflow through a steely wire guided in a flexible tube, connecting such wire by its ends with a first mechanism associated with the pushbutton and a second mechanism associated with the overflow, such overflow including also a bell.

It is characterized in that the bell (7) comprises a top piece (7') and a bottom piece (7"), which joined together define a lower configuration of coupling of battlemented structure which is associated with a surrounding upper section of an intermediate coupling base (43-43'-43") linked to the curb (5-5'-5").

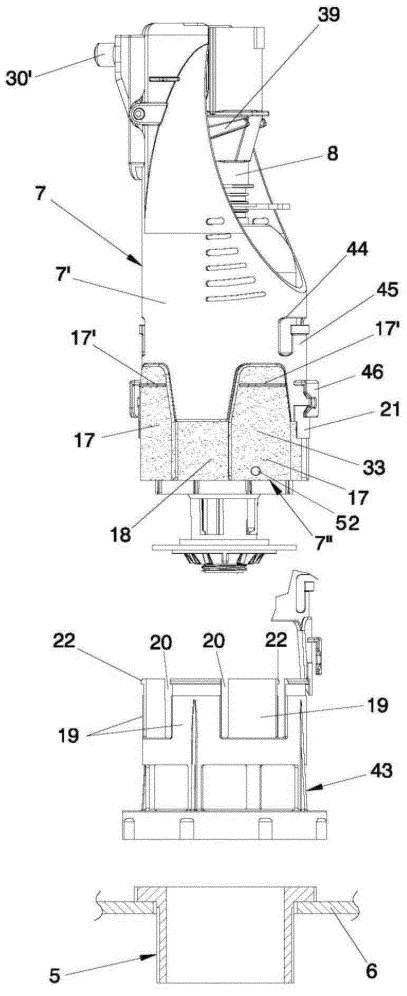

FIG. 2

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Description

OBJECT OF THE INVENTION

[0001] The present invention, as expressed in the statement of this specification, relates to a device for flushing toilet tanks that is of the type wherein you can select a partial flush or a full flush of the tank by pressing down on a double pushbutton with two buttons, so that pressure on one of the two buttons of the double pushbutton is transmitted to the flush system through a steely wire, similar to that employed in the bicycle brakes.

[0002] On this premise, the invention improvements focus on characteristic linking means between the bell of the flush system and a curb fixed at the bottom of the tank.

[0003] Other improvements of the invention are focused in a first upper mechanism associated with the button and a second lower mechanism associated with the overflow, so that both cited mechanisms are related by the steely wire, so by pressing on one of the two buttons on the pushbutton, the overflow amounts up releasing the output of water from the tank through the curb, transmitting the movement through both cited mechanisms and the steely wire that connects them. When stop acting on the pushbutton, the exit of the water from the tank is obturated.

[0004] The benefits are initially the enormous versatility afforded by the new mounting design to the curb of the tank and the constructive simplicity in the elements of wire drive, both in regards to some triggers and in regards to recovery springs, etc., which confer simplicity and economy to the device of the invention.

BACKGROUND OF THE INVENTION

[0005] Currently, there are plenty of devices for flushing toilet tanks generally comprising a pushbutton, a flush system and a curb fixed at the bottom of the tank, such that when acting on the pushbutton the overflow of the flush system is raised releasing the output of water from the tank and when ceasing to exert pressure on such pushbutton the initial position is recovered obturating again the exit from the tank by means of an obturating gum fixed to the overflow that closes the output mouth located in the interior of the curb.

[0006] It is worth noting for example the patent of invention number ES2136547 of the same applicant as the one of the present invention, such patent being referred to a partial or full, double flush device, without having to interrupt the flush by the user. To this end, the pushbutton incorporates a first button associated with a top float for partial flush and a second button associated with a bottom float for full flush.

[0007] These devices for flushing toilet tanks have an excessive complexity in its operation, some of them being imprecise and expensive.

DESCRIPTION OF THE INVENTION

[0008] In order to achieve the objectives and to avoid the drawbacks referred to in the preceding paragraphs, the invention proposes a device for flushing toilet tanks having a pushbutton for flush that when pressing on it an overflow of a flush system is raised upwards, causing the flush of the tank through a curb established in correspondence with the bottom of such tank, linking the pushbutton with the overflow through a steely wire guided in a flexible tube, connecting the above-mentioned steely wire by its ends with a first mechanism associated with a vertical rod of the pushbutton and a second mechanism associated with the overflow, such overflow including also a bell that is linked to the curb of the tank through which the water flows into the toilet when the flush system is activated, the vertical rod being guided on a neck of a fixed housing of the pushbutton.

[0009] It is characterized in that the bell of the flush system comprises a top piece and a bottom piece that joined together define a lower configuration of coupling of battlemented structure, that is associated with a surrounding upper section of an intermediate coupling base through a coupling mechanism, said base being linked in turn to the curb of the tank.

[0010] Another feature of the invention is that the bell has a battlemented lower structure arranged in its top piece, formed by anchoring extensions alternating with intermediate gaps wherein battlemented embossings of the bottom piece are coupled, said bottom piece comprising holes for adjustment of battlements of the coupling base, the latter also having alternate recesses for the coupling of battlemented embossings of the bottom piece of the bell, the recesses and the battlements being arranged in the upper section of the intermediate coupling base, the anchoring extensions having interior embossings snagged on some outer tabs incorporated in the battlements of the intermediate coupling base.

[0011] The invention is characterized also in that above the anchoring extensions and in proximity to them, the top piece of the bell comprises inverted "U"-shaped cuts delimiting operation portions for unnailing the assembly or bell from the intermediate coupling base.

[0012] Another possibility of coupling of the bell of the flush system with regard to the intermediate coupling base is that such coupling is carried out through a bayonet anchoring by rotation of the bell, said anchoring bayonet being determined by female elements that start from an raised area of the battlemented structure of the bell and by male elements in the manner of lugs that start in the intermediate coupling base, while the battlemented structure cited, with the exception of its raised area, fits into the interior of the intermediate coupling base.

[0013] In an embodiment the intermediate coupling base comprises an independent body that connects at its bottom part with the curb of the tank.

[0014] In a second embodiment, the intermediate coupling base and corresponding curb comprise a single

one-piece piece.

[0015] The first mechanism associated with the pushbutton is characterized in that it comprises a top bascule trigger with angular structure, one of whose branches articulates by its free end on an anterior axis integral with a housing of the assembly of the pushbutton, while by the joining area of the two branches of the cited trigger, it connects articulately with a terminal lug integral with one end of the steely wire, the free end of the other matching branch of the top bascule trigger contacting with a vertical rod of the pushbutton, the downward displacement of which makes the top bascule trigger rotate against the resistance of a recovery spring forming part of a second mechanism associated with the overflow.

[0016] The second mechanism associated with the overflow of the flush system is characterized in that it comprises a bottom bascule trigger which articulates into an intermediate piece attached to the top of the bell, such trigger having an angular structure consisting of a vertical branch that incorporates the recovery spring and a double horizontal bent branch that is in contact with the underside of a ring seat of the overflow, connecting at the free end of the vertical branch of the bottom bascule trigger a terminal lug integral with one end of the steely wire.

[0017] The connection articulated in the anterior axis of the top bascule trigger is characterized in that it comprises an open extension mountable and detachable through a displacement perpendicular to the direction of the anterior axis.

[0018] Another feature of the invention is that the bottom bascule trigger has lateral appendages as means of articulation of such bottom bascule trigger, such lateral appendages coupling in the intermediate piece, at the same time that they are located in the area of confluence of the two branches of the above-mentioned bottom bascule trigger.

[0019] The recovery spring of the bottom bascule trigger is characterized in that it comprises at least one elastic fin, in the active position of which it contacts by its free end against an inner part of the bell, so that in this active position of the at least one elastic fin, it tends to position the assembly of the overflow and both mechanisms, first and second, towards its initial resting position corresponding with the obturation of the output mouth of the water from the tank.

[0020] The end sections of the flexible tube that protects the steely wire are anchored, said end sections, in a split top extension fixed to the housing of the pushbutton and in a split bottom extension fixed to the intermediate piece attached to the bell of the flush system. This split structure of such extensions facilitates mounting and placement of the flexible tube.

[0021] Another feature of the invention is that the end sections of the flexible tube where the steely wire is guided, such end sections of the flexible tube incorporate embossings of retention that are embedded in notches established in such split extensions.

[0022] Another feature of the invention is that the inside of the neck of the fixed housing of the pushbutton comprises a first pair of opposing grooves that run the entire length of said neck and a second pair of opposing grooves that only affect a lower section of said neck, fitting in the second pair of opposing grooves end protrusions integral with the vertical rod in the mounted position of the assembly of the pushbutton, while during its assembly the end protrusions of the vertical rod run through the first couple of opposing grooves, this substantially facilitating mounting and dismounting of the vertical rod associated with the two buttons of the pushbutton without having to mount and dismount other elements.

[0023] In another embodiment of the present invention at least one of the battlemented embossings of the lower part of the bell comprises at least one hole in the bottom of the same for the evacuation of water from the interior of the device. Thus these holes prevent the effect of 'inverted glass' generated in the interior of the bell since when said bell is raised for the evacuation of water by the curb, the water from the interior of the bell would be retained in the interior of the same by the above-mentioned effect which would hinder the descent of the device. Through the above-mentioned holes enters air inside of the bell which ensures the water outlet and ensures at the same time the correct descent of the bell and therefore a correct closure of the device.

[0024] Next, in order to facilitate a better understanding of this specification and forming an integral part of the same are attached figures wherein with illustrative and not limiting character the object of the invention has been represented.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025]

Figure 1.- Shows a sectioned elevational view of the device for flushing toilet tanks, object of the invention. Basically it comprises a pushbutton, a flush system with two floats for selecting a partial or full flush through one of the two buttons included in the pushbutton and an intermediate coupling base and curb assembly, fixed at the bottom of the tank, intermediate coupling base to which the flush system is connected. The pushbutton is related to the flush system through a steely wire.

Figure 2.- Shows an exploded view of a first embodiment of the flush system and intermediate coupling base and curb assembly in relation to the anchoring means between the two.

Figure 3.- Shows a view of a one-piece body that makes up the curb and intermediate coupling base assembly.

Figure 4.- Shows an elevational view of a second embodiment of the flush system and intermediate coupling piece and curb assembly in relation to the coupling.

Figure 5.- Shows a sectioned perspective view of

the pushbutton, highlighting a first upper mechanism linked to a second lower mechanism of the flush system through the steely wire.

Figure 6.- Shows a sectioned perspective view of the top of the assembly of the flush system where the second lower mechanism linked to the top of an overflow that forms part of the above-mentioned flush system is highlighted, on the bottom of which an obturating gum is fixed.

Figure 7.- Shows a top plant view of a housing of the pushbutton. Two pairs of opposing grooves are highlighted.

Figure 8.- Shows a sectional view according to the A-A section of the previous figure.

Figure 9.- Shows a sectional view according to the B-B section of figure 7.

EXAMPLE OF EMBODIMENT OF THE INVENTION

[0026] Considering the numbering adopted on the figures, the device for flushing toilet tanks comprises in principle a pushbutton 1 with a first button 2 for a partial flush and a second button 3 for a full flush of the tank, a flush system 4 and a curb 5-5'-5" fixed in the bottom 6 of the tank, the system flush 4 being connected to an intermediate coupling base 43-43'-43" associated to the curb 5-5'-5" through a bell 7 forming part of the above-mentioned flush system 4.

[0027] The flush system 4 includes in addition to the above-mentioned bell 7, an overflow 8, in the lower section of which an obturating gum 9 is fixed that rests on the closing position on a ring lip 10 of the curb 5-5-5", which lip delimits an output mouth of the water from the tank into the toilet when such output mouth is released by pressing on one of the two buttons of the pushbutton 1.

[0028] The overflow 8 is associated in turn with a top float 11 for the partial flush and another bottom float 12 for the full flush. As it is evident, both floats 11-12 are housed within the bell 7, more specifically within the bottom piece 7', which together with another top piece 7" make up the bell 7.

[0029] The elevation of the overflow 8 when acting on one of the buttons of the pushbutton 1 is transmitted through a steely wire 13 protected by a flexible tube 14, a first mechanism 15 that links one end of the steely wire 13 with the pushbutton 1 and a second mechanism 16 linking the other matching end of the steely wire 13 with the upper section of the above-mentioned overflow 8.

[0030] In a first embodiment, the bell 7 has a battlemented lower structure arranged in its top piece 7', formed by anchoring extensions 21, alternating with intermediate gaps 33, wherein battlemented embossings 17 of the bottom piece are coupled 7". At least one of the battlemented embossings 17 has at least one hole 52 on its bottom for the entry of air into the interior of the bell 7 which ensures the emptying of the same during the flushing operation of the device object of the invention. When the bell 7 is closed on the coupling intermediate base 43-43', the at least one hole 52 is on the bottom line of the complementary battlements 19 such that when rising the bell 7 it is always going to allow the entry of air into the interior of the above-mentioned bell 7.

[0031] Said bottom piece 7" comprises gaps 18 where some battlements 19 are adjusted, these alternating in turn with recesses 20 of an intermediate coupling base 43-43', said battlements 19 being complementary with the anchoring extensions 21 of the top piece 7' of the bell 7, the recesses 20 and the battlements 19, being arranged in the upper section of the intermediate coupling base 43-43'. Said anchoring extensions 21 are provided with interior embossings 23 snagged in external tabs 22 incorporated in the battlements 19 of the intermediate coupling base 43 43'.

[0032] With this configuration described above, the flush system 4 couples in the battlements of the intermediate coupling base 43-43' associated to the respective curb 5-5' being attached to the flush system 4 by the clipping action of the two anchoring extensions 21 on the upper edges of said battlements 19, for which they have the above-mentioned external tabs 21, on which the interior embossings 23 of such anchoring extensions 21 are snagged. In this way the bottom piece 7" of the bell 7 is retained by the interaction of the top piece 7' and the coupling base 43-43'.

[0033] Above the anchoring extensions 21 and in proximity to the same, the bell 7 comprises inverted "U"-shaped cuts 44 that delimit operation portions 45 to swing the cited anchoring extensions 21, in such a way that pressing on such activation portions 45 manages to disengage the assembly of the flush system 4 with respect to the intermediate coupling base 43-43' achieving only axial disconnection.

[0034] Figure 4 also shows another option of assembly on the intermediate coupling base 43" that is part of a single one-piece piece together with the standard anchoring curb 5", that is, without the battlements 19, for which the flush system 4 incorporates in the battlemented structure of the bell 7 also bayonet anchorings 24 by rotation of the bell, being determined by male elements 25 in the manner of lugs integral with the above-mentioned intermediate coupling base 43" and female elements 46 integral with the bell that are embedded in the male elements 25 when the bell is rotated in the right direction.

[0035] In this case stops 17' provided in the bottom piece 7' of the bell 7 interact with the upper edge of the intermediate coupling base 43".

[0036] The first mechanism 15 associated with the pushbutton 1, comprises a top bascule trigger 26 with angular structure, one branch of which articulates by its free end on an anterior axis 27 integral with a support 28 of the assembly of the pushbutton 1, while by the joining area of both branches of such top bascule trigger 26 it articulately connects with a terminal lug 29 integral with one end of the steely wire 13. The connection articulated in the anterior axis 27 comprises an open extension 42 to facilitate its extraction perpendicular to the direction of

such anterior axis 27, also allowing having a good lever arm without affecting the anchorage of the steely wire 13.

[0037] On the other hand, the free end of the other matching branch of the top bascule trigger 26 is in contact with a vertical rod 34 of the pushbutton 1, so that when acting on the same, the vertical rod 34 descends against the resistance of a spring 35, pushing such vertical rod 34 by its bottom end to the above-mentioned top bascule trigger 26 pulling the steely wire 13 acting on the second mechanism 16 associated with the overflow 8 raising it upwards to cause the emptying of the tank.

[0038] The pushbutton 1 comprises a fixed housing 47 provided with a neck 48, inwardly incorporating said neck 48 a first pair of opposing grooves 49 running throughout the length of said neck 48 and a second pair of opposing grooves 50 only affecting a lower section of said neck 48, fitting in the second pair of opposing grooves 50 end protrusions 51 integral with the vertical rod 34 in the mounted position of the assembly of the pushbutton 1, while during its assembly the end protrusions 51 run through the first pair of opposing grooves 49.

[0039] Therefore, the first pair of opposing grooves 49 run inside the neck 48 in its entirety, such that facing on them the end protrusions 51 of the vertical rod 34 we introduce, by the top, said vertical rod 34, during its assembly, until it emerges by the lower end of the neck 48, overcoming the resistance of the spring 35, obtaining thereby that the cited end protrusions 51 of the vertical rod 34 exceed said lower end of the neck 48, in order to then rotate 90° said vertical rod 34 and thus be able to introduce such end protrusions 51 in the second pair of smaller length opposing grooves 50, that run only internally a small portion of the neck 48, such as described above.

[0040] The action of the spring 35 of the pushbutton takes back the vertical rod 34 to its working position, this time guided in the second pair of smaller length opposing grooves 50, hiding the end protrusions 51 and leaving the pushbutton mounted without any possibility of disconnection between its different moving parts, such that in this way the assembly functions of the mechanism are simplified, by providing the user with the assembly fully prepared for its connection to the steely wire system.

[0041] In turn, on the support 28 of the pushbutton 1 a split top extension 30 is connected, wherein is fixed an end section of the flexible tube 14 provided with retention embossings 31 that are embedded in small notches 32 of such split extension 30, thus facilitating the fixation and assembly of the flexible tube 14.

[0042] The opposing end section of the flexible tube 14 has other retention embossings 31' that are embedded in other notches 32' located in another split bottom extension 30' connected to the top of the bell 7 of the flush system 4.

[0043] On the other hand, the second mechanism 16 associated with the overflow 8 includes a bottom bascule trigger 36 that articulates in the top of the bell 7 through lateral appendages 37 forming part of such bottom bascule trigger 36. This has in principle an angular structure consisting of a vertical branch 38 and a double horizontal bent branch 39 which is in contact with a ring seat 40 of the overflow 8.

[0044] In the free end of the vertical branch 38 of the bottom bascule trigger 36 articulates a terminal lug 29' where the free end of the steely wire 13 is connected, so that when acting on the pushbutton 1, the steely wire 13 pulls the bottom bascule trigger 36 making it swing against the resistance of a recovery spring 41 forming part of such trigger 36, with which the double horizontal bent branch 39 pushes upwards the overflow 8 to proceed with the flushing of the tank.

[0045] When ceasing pressing on the pushbutton 1, the first mechanism 15 and the second mechanism 16 recover their resting position thanks to the recovery spring 41 formed by a pair of elastic fins 41 that contact in the active position against the inner face of a part of the bell 7, position in which such elastic fins are stressed and tend to position the bottom bascule trigger 36 towards its resting position.

[0046] This bottom bascule trigger 36 that receives the traction of the steely wire 13 of the pushbutton 1 and recovery spring 12, have a one-piece configuration, with which the need to mount independent springs as it occurs in other conventional flush systems is prevented.

Claims

1. Device for flushing toilet tanks, having a flushing pushbutton that when it is pressed an overflow of a flush system rises upwards, causing the flushing of the tank through a curb established in correspondence with the bottom of said tank, the pushbutton being linked with the overflow through a steely wire guided on a flexible tube, connecting said steely wire by its ends with a first mechanism associated with a vertical rod of the pushbutton and a second mechanism associated with the overflow, said overflow further including a bell that is linked to the curb of the tank through which the water flows towards the toilet when the flush system is activated, the vertical rod being guided on a neck of a fixed housing of the pushbutton; **characterized in that** the bell (7) of the flush system (4) comprises a top piece (7') and a bottom piece (7"), which joined together define a lower configuration of coupling of battlemented structure, which is associated with a surrounding upper section of an intermediate coupling base (43-43'-43") through a coupling mechanism, said base being linked in turn to the curb (5-5'-5") of the tank (6).

2. Device for flushing toilet tanks, according to claim 1, **characterized in that** the bell (7) has a battlemented bottom structure arranged in its top piece (7'), formed by anchoring extensions (21) alternating with intermediate gaps (33) wherein are coupled battlement-

ed embossings (17) of the bottom piece (7), comprising said bottom piece (7") gaps (18) for the adjustment of battlements (19) of the coupling base (43-43'), the latter also having alternated recesses (20) for the coupling of battlemented embossings (17) of the bottom piece (7") of the bell (7), the recesses (20) and the battlements (19) being arranged in the upper section of the intermediate coupling base (43-43'), the anchoring extensions (21) having interior embossings (23) snagged in external tabs (22) incorporated in the battlements (19) of the intermediate coupling base (43-43').

3. Device for flushing toilet tanks, according to claim 2, **characterized in that** on top of the anchoring extensions (21) and in proximity to the same, the bell (7) comprises inverted "U"-shaped cuts (44), that delimit operation portions (45) to swing the above-mentioned anchoring extensions (21).

4. Device for flushing toilet tanks, according to claim 1, **characterized in that** the bell (7) of the flush system (4) is anchored to the intermediate coupling base (43) by means of a bayonet anchoring (24) by rotation of the bell (7), said bayonet anchoring comprising female elements (46) that start from a raised area of the battlemented structure of the bell (7) and male elements (25) in the manner of lugs that start from the intermediate coupling base (43"), at the same time that the above-mentioned battlemented structure, with the exception of its raised area, fits into the interior of the intermediate coupling base (43").

5. Device for flushing toilet tanks, according to claim 2, **characterized in that** the intermediate coupling base (43) comprises an independent body which connects at its bottom with the curb (5) of the tank (6).

6. Device for flushing toilet tanks, according to claim 2, **characterized in that** the intermediate coupling base (43'-43") and curb (5'-5") both elements comprise a single one-piece piece.

7. Device for flushing toilet tanks, according to claim 1, **characterized in that** the first mechanism (26) associated with the pushbutton (1) comprises a top bascule trigger (26) with angular structure, one branch of which articulates by its free end in an anterior axis (27) integral with a housing (28) of the assembly of the pushbutton (1), while by the joining area of both branches of said trigger, it connects articulately with a terminal lug (29) integral with one end of the steely wire (13), contacting the free end of the other matching branch of the top bascule trigger (26) with a vertical rod (34) of the pushbutton (1), the downward displacement of which makes the top bascule trigger (26) rotate against the resistance of a recovery spring (41) which forms part of the second mechanism (16) associated with the overflow (8).

8. Device for flushing toilet tanks, according to claim 7, **characterized in that** the second mechanism (16) associated with the overflow (8) of the flush system (4) comprises a bottom bascule trigger (36) which articulates at the top of the bell (7), such trigger (36) having an angular structure consisting of a vertical branch (38) that incorporates the recovery spring (41) and a double horizontal bent branch (39) that is in contact with the bottom side of a ring seat (40) of the overflow (8), connecting at the free end of the vertical branch (38) of the bottom bascule trigger (36) a terminal lug (29) integral with one end of the steely wire (13).

9. Device for flushing toilet tanks, according to claim 8, **characterized in that** the connection articulated in the anterior axis (27) of the top bascule trigger (26) comprises an open extension (42) mountable and detachable through a displacement perpendicular to the direction of the anterior axis (27).

10. Device for flushing toilet tanks, according to claim 9, **characterized in that** the bottom bascule trigger (36) has lateral appendages (37) as a means of articulation of said trigger (36), at the same time that the same are located in the area of confluence of the two branches (38-39) of the bottom bascule trigger (36).

11. Device for flushing toilet tanks, according to claim 8, **characterized in that** the recovery spring (41) of the bottom bascule trigger (36) comprises at least one elastic fin, in the active position of which contacts by its free end against an internal part of the bell (7) of the flush system (4).

12. Device for flushing toilet tanks, according to claim 8, **characterized in that** the end sections of the flexible tube (14) are anchored in a split top extension (30) fixed to the housing (28) of the pushbutton (1) and in a split bottom extension (30') that connects to the bell (7) of the flush system (4).

13. Device for flushing toilet tanks, according to claim 12, **characterized in that** the end sections of the flexible tube (14) comprise retention embossings (31-31') embedded in notches (32-32') located in the interior of the split top extension (30) fixed to the housing (28) of the pushbutton (1) and in the split bottom extension (30') fixed to the intermediate piece (33) attached to the bell (7) of the flush system (4).

14. Device for flushing toilet tanks, according to claim 1, **characterized in that** the neck (48) of the fixed housing (47) of the pushbutton (1), said neck (48) comprises a first pair of opposing grooves (49) that run

throughout the length of said neck (48) and a second pair of opposing grooves (50) that affect only a lower section of said neck (48), fitting in the second pair of opposing grooves (50) end protrusions (51) integral with the vertical rod (34) in the mounted position of the assembly of the pushbutton (1), while during its assembly the end protrusions (51) run through the first pair of opposing grooves (49).

15. Device for flushing toilet tanks, according to any one of the preceding claims, **characterized in that** at least one of the battlemented embossings (17) of the bottom piece (7") of the bell (7) comprises at least one hole (52) in its bottom for the entry of air into the interior of the bell (7).

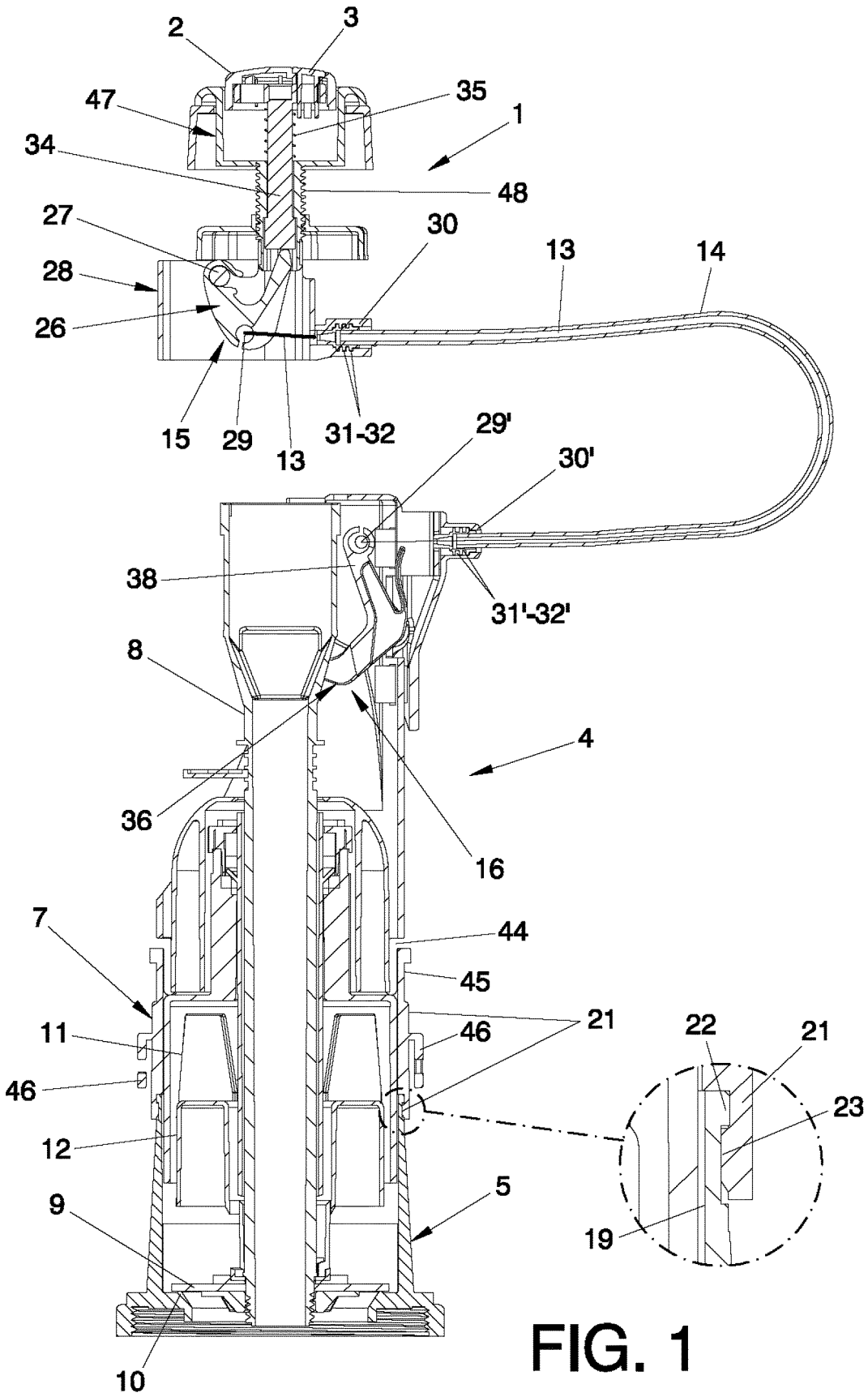
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FIG. 1

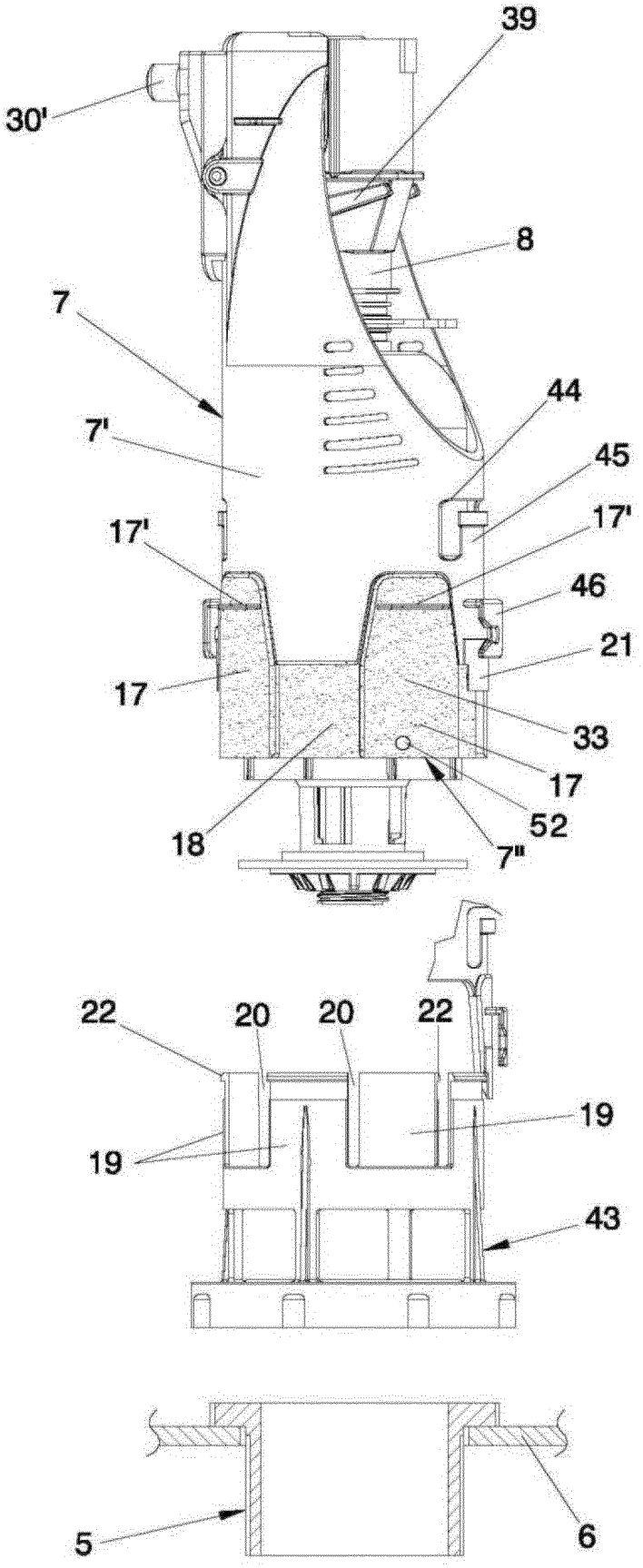

FIG. 2

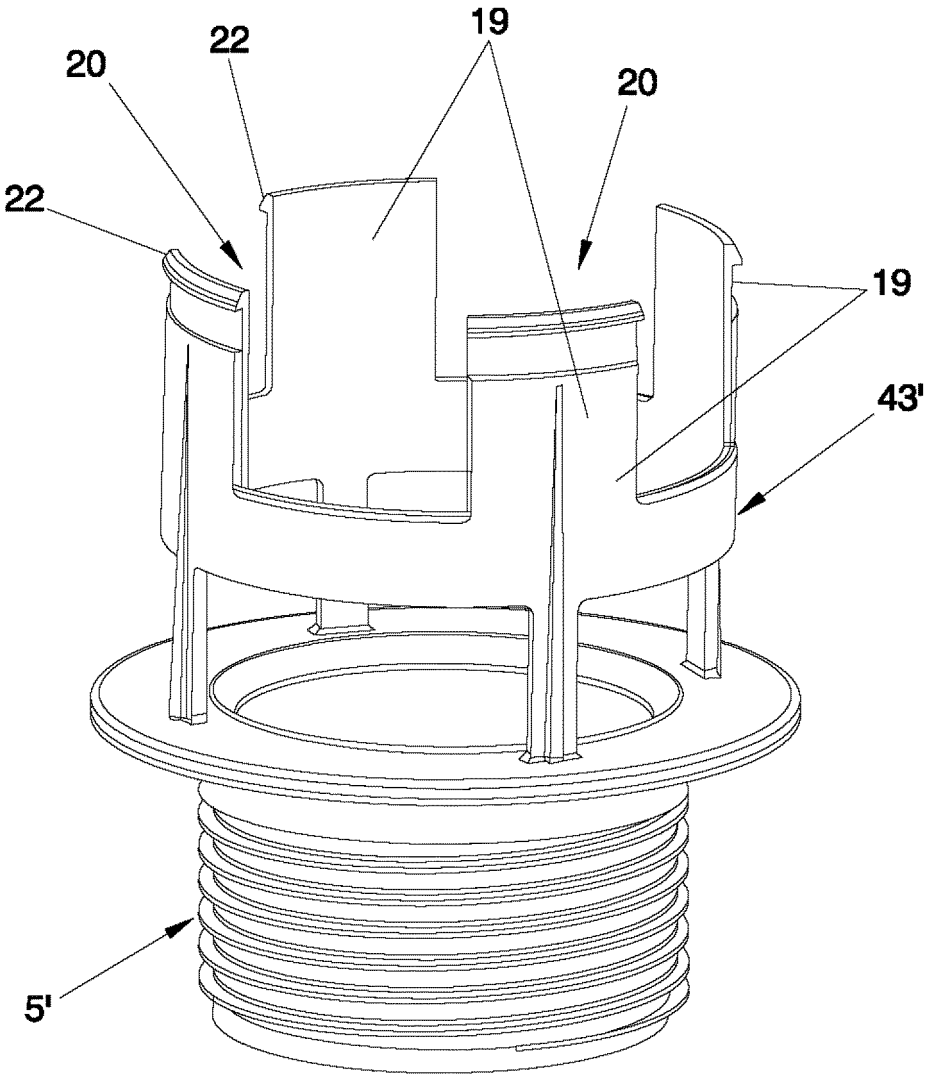

FIG. 3

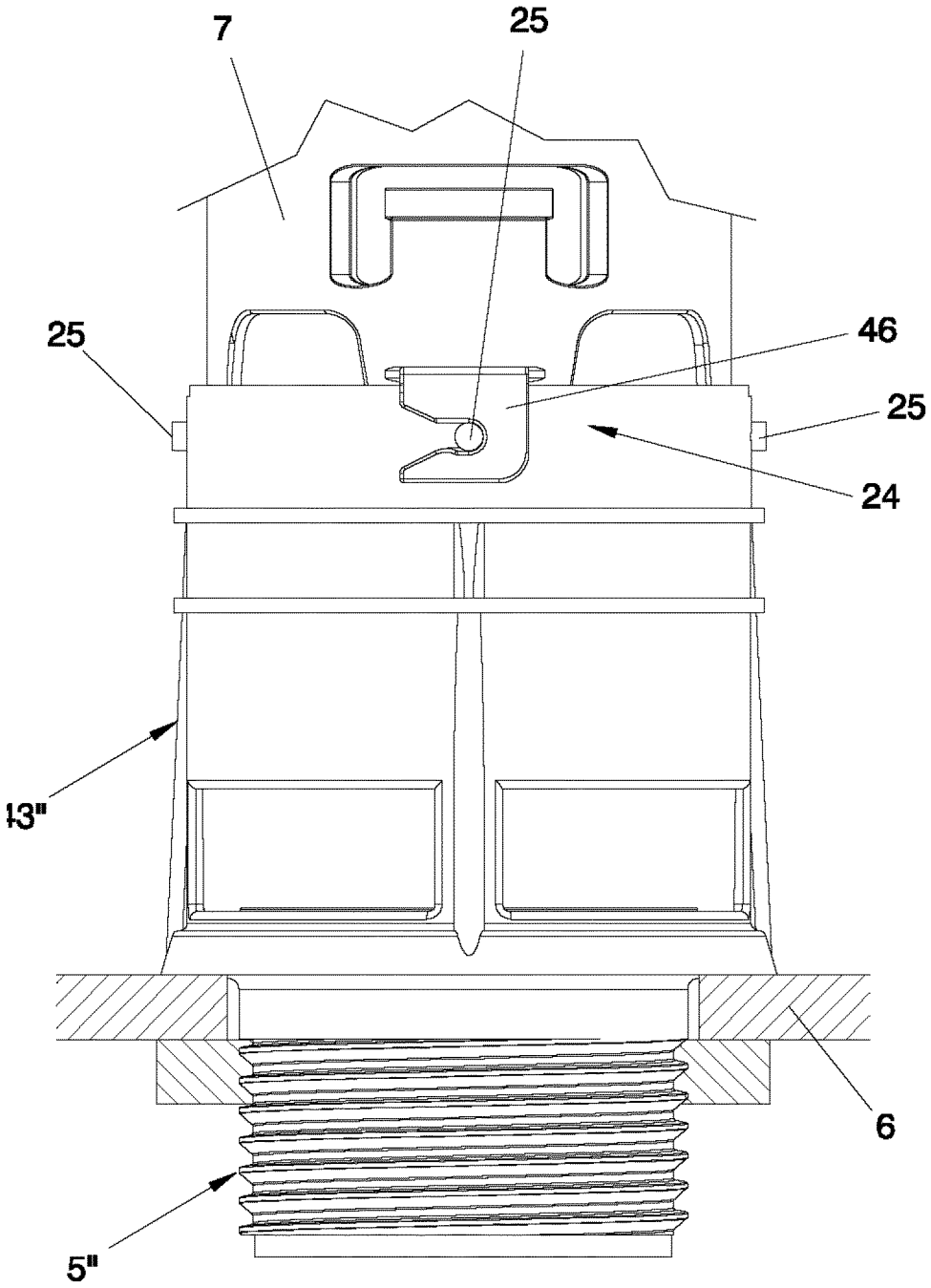

FIG. 4

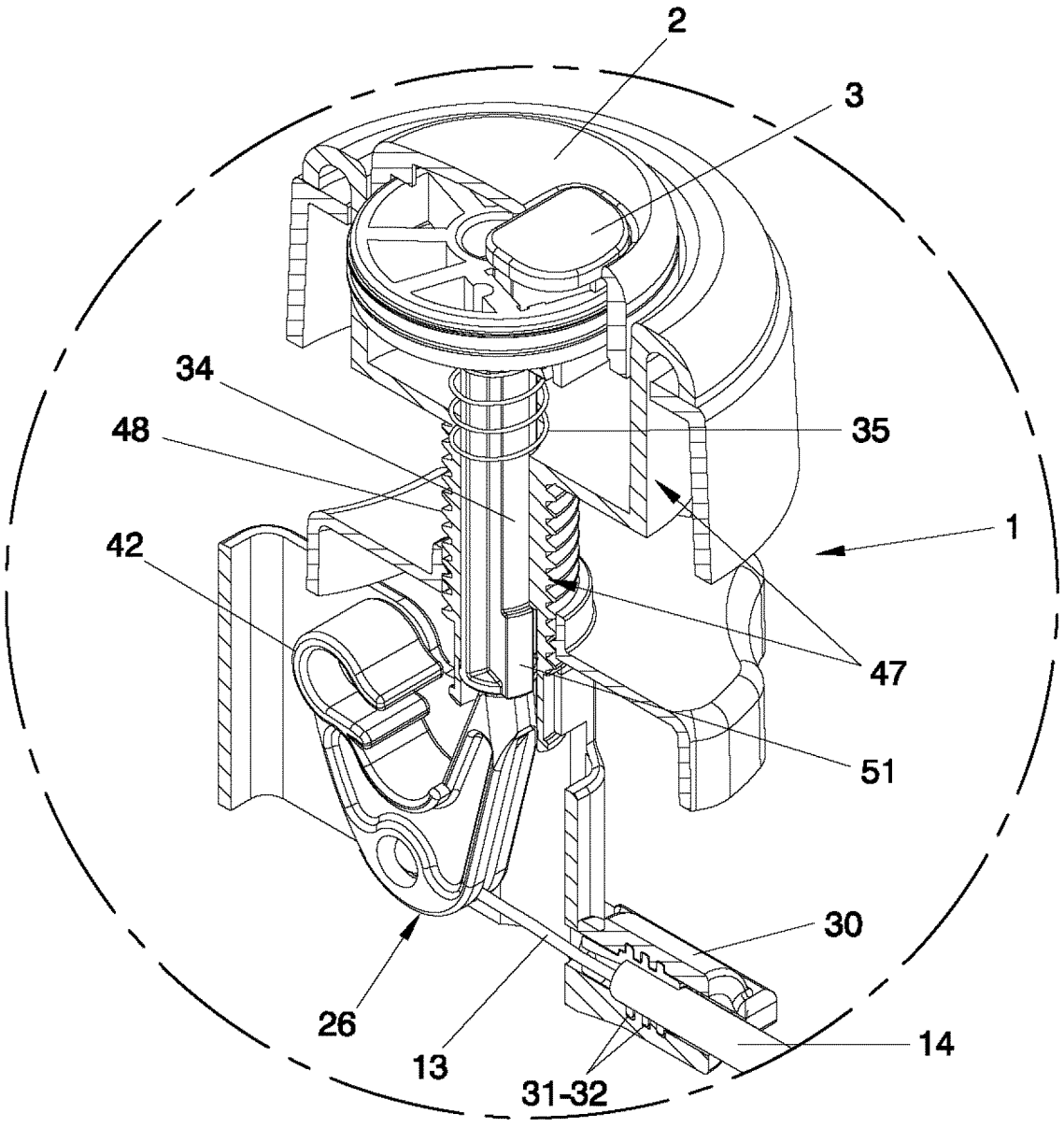

FIG. 5

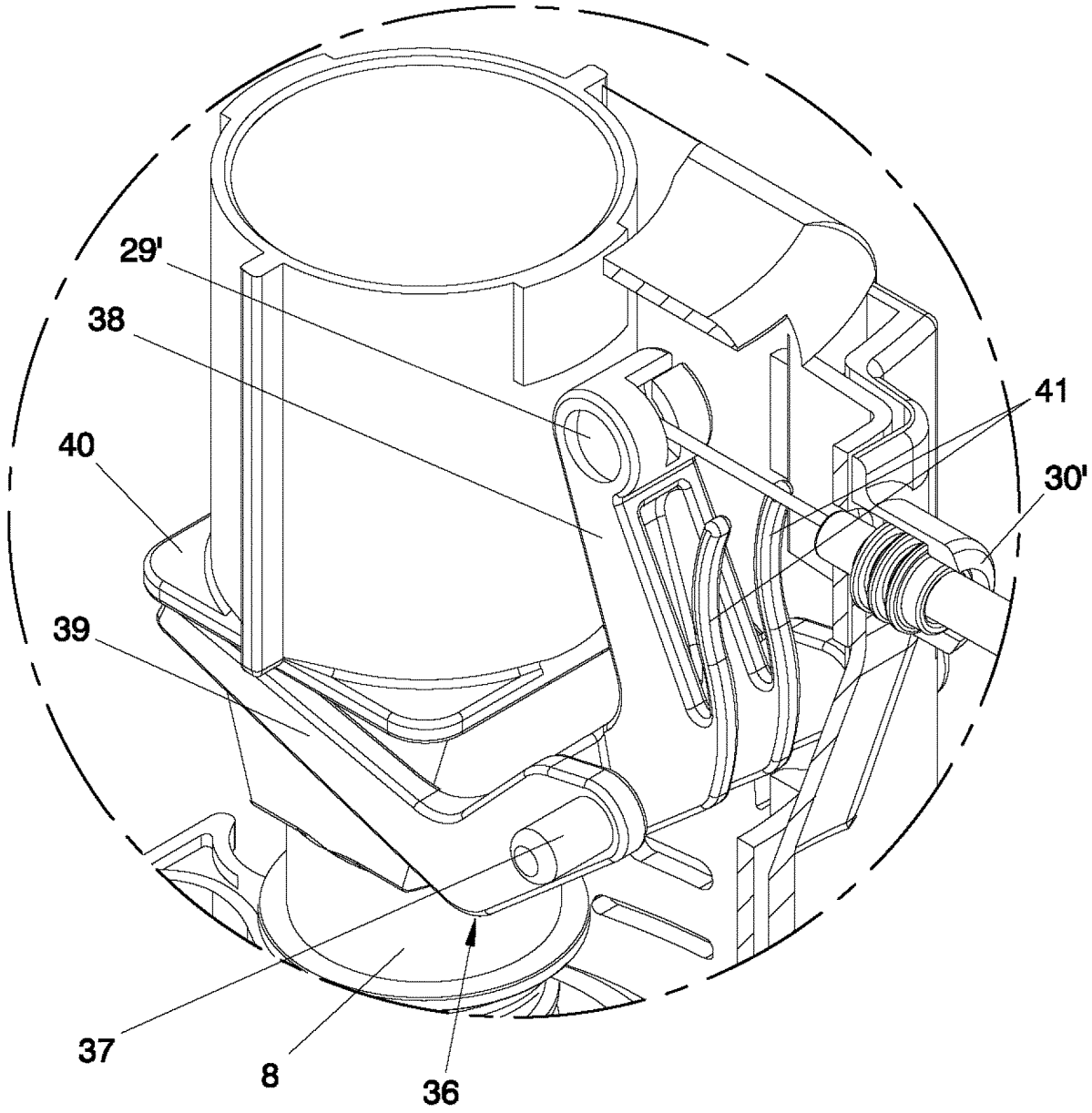

FIG. 6

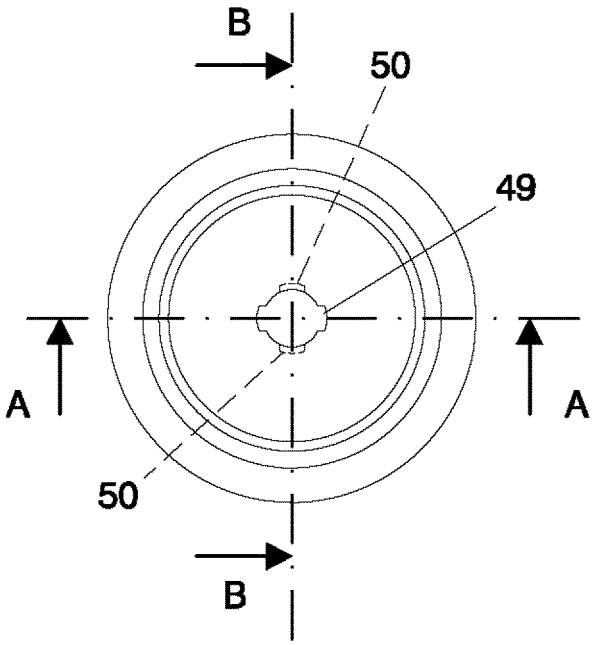

FIG. 7

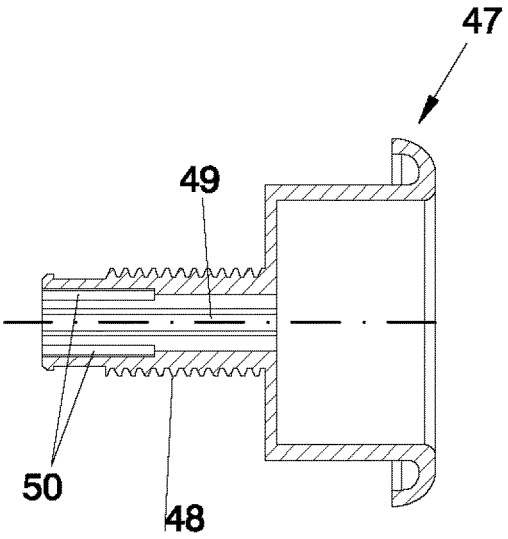

FIG. 9

B-B

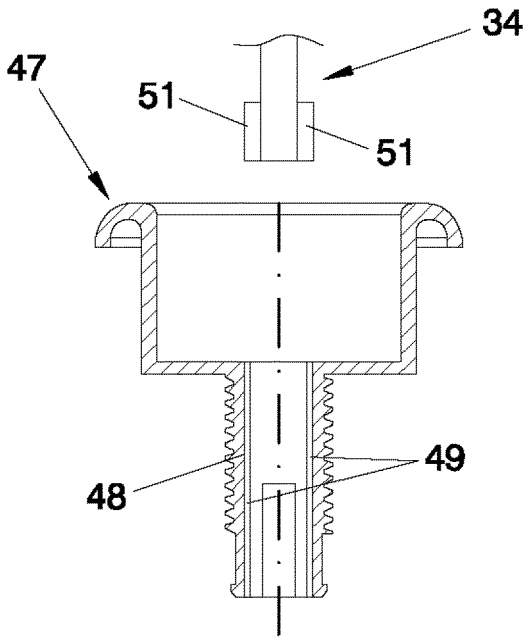

FIG. 8

A-A

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2012/070009

A. CLASSIFICATION OF SUBJECT MATTER

E03D1/14 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E03D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 2547787 Y (NISONG PLASTIC INDUSTRY CO LTD) 30/04/2003, Abstract from DataBase Epodoc. Retrieved from epoque, pn:CN2547787Y. Figures 1-4.	1,15
A	ES 2244272 A1 (FOMINAYA SA) 01/12/2005, column 5, line 34 - column 8, line 64; figures 1 - 4.	1-15
A	EP 0796954 A1 (CECCHI ENZO) 24/09/1997, column 2, línea44- column 5, line 18; figures 1 - 8.	1-15
A	ES 2202509 T3 (OLIVEIRA & IRMAO SA) 01/04/2004, column 2, line 22 - column 6, line 36; figures 1 - 6.	1-15

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
27/03/2012	**(16/04/2012)**
Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04	Authorized officer S. De Miguel De Santos Telephone No. 91 3493270

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/ES2012/070009

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REFERENCES CITED IN THE DESCRIPTION

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