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(71) Applicant: **Fominaya, S.A.**
46117 Betera, Valencia (ES)

(72) Inventor: **FOMINAYA GONZÁLEZ, Pablo**
46117 Bétera (Valencia) (ES)

(74) Representative: **Ballester Cañizares, Rosalia**
Ballester Intellectual Property SLP
Avda. de la Constitución16, 1º D
03002 Alicante (ES)

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(54) **DEVICE FOR REGULATING THE HEIGHT OF A CISTERN FLUSHING MECHANISM**

(57) The invention relates to a device for regulating the height of a cistern flushing mechanism to adapt it to the same comprising a long part (1), which is adjustable axially and fits into a conduit (2) which passes through the upper base (4a) of the main body (4) of the flushing mechanism (5) and finding itself associated with a part of a push mechanism (19) which, when activated, moves the main body (4) of the flushing mechanism (5) downwards. Said conduit (2) is defined by two facing extensions (3), in the form of a neck, which start from the upper base (4a) of the main body (4). A circular tightening part (8) is coupled around the two facing extensions (3). Furthermore, the facing extensions (3) have inner opposing portions which face opposite portions of the long part (1). The long part can be used to assume a locked position in which it is axially retained, and a release position.

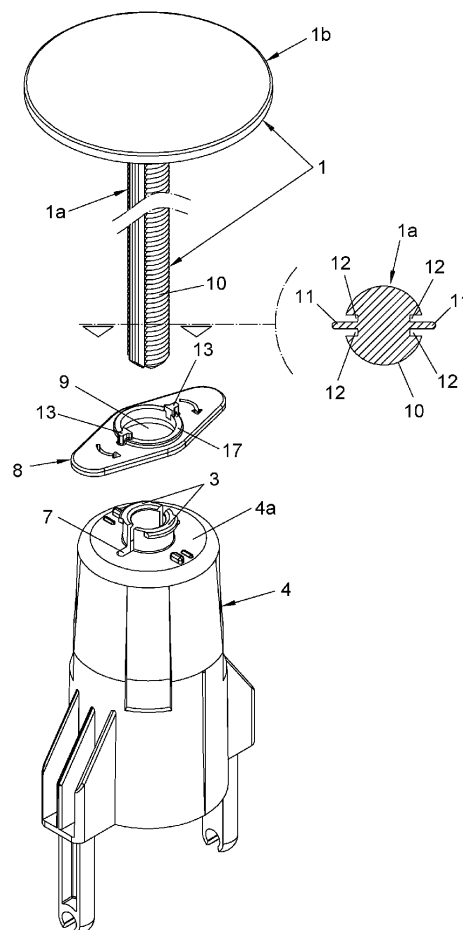


FIG. 1

Description

OBJECT OF THE INVENTION

[0001] This invention, as expressed in the heading, refers to a device for regulating the height of a cistern flushing mechanism, the purpose of which is to lock and improve the regulation of height of a means of activating the cistern flushing mechanism.

PRIOR ART

[0002] Currently, one of the most important actions in the installation of a flushing mechanism in a cistern is regulating its height to adapt it to the size of said cistern, and that the range of activation is correct for its functioning.

[0003] In this sense, the invention patent with the publication number ES 2258900 is known about, which consists of a system to block regulating elements of a cistern which is destined to prevent the involuntary turning of height regulating elements fitted inside the cistern, so that the regulating elements are associated with guide screws, wherein the coupling between these and the surfaces said screws abut, and said coupling includes male and female parts which prevent involuntary turning and unscrewing.

DESCRIPTION OF THE INVENTION

[0004] The device for regulating the height of a cistern flushing mechanism which constitutes the object of the invention, comprises a long part fitted inside a centred hole which passes through an upper base of a main body of the flushing mechanism, wherein the position of said long part is axially regulatable, and wherein the long part is associated with a part of a push mechanism which, when activated, moves the main body of the flushing mechanism downwards by means of the long part.

[0005] The centred hole of the main body of the flushing mechanism comprises a conduit defined by two facing extensions which start from the upper base of the main body, said conduit also passing through the upper base of the main body.

[0006] The two facing extensions are fitted inside a circular orifice comprising a tightening part coupled around said facing extensions which comprise a neck-like structure; wherein some of the outer faces of the facing extensions are in contact with the edge of the orifice of the tightening part which has gyratory mobility around the facing extensions.

[0007] The two facing extensions have inner opposing portions which face opposite portions of the long part; wherein, in a locking position of the long part, the tightening part deforms the facing extensions causing the axial retention of the long part through the mediation of the inner opposing portions of the two facing extensions, and, in a release position, the tightening part does not deform

the facing extensions, the long part having axial mobility.

[0008] Some of the upper edges of the facing extensions have internal wings facing the opposing portions of the long part and other external wings; wherein the tightening part is axially retained between the upper base of the main body and the outside wings of the two facing extensions.

[0009] The tightening part incorporates two opposing projections which protrude above an upper face of said tightening part and which are at the height of the external wings of the facing extensions; wherein, in the locking position of the long part, said projections press against the external wings through mediation of the two opposing projections which protrude above the upper face of the tightening part; and wherein, in the release position of the long part, the opposing projections are not in contact with said external wings of the facing extensions.

[0010] The opposing projections of the facing extensions are adjacent to the orifice of the tightening part; wherein inner areas of the projections are a continuation of the annular surface which defines the orifice of the tightening part.

[0011] The long part comprises a rod consisting of two transversal striations and two longitudinal wings disposed in a perpendicular plane with respect to the plane where the transversal striations, which face the inner opposing portions of the two facing extensions which form part of the main body of the flushing mechanism, are found.

[0012] The longitudinal wings fit into opposing grooves as a means of guiding the axial movement of the long part when it comes to positioning it at the required height.

[0013] Said opposing grooves are defined between pairs of opposing edges of the facing extensions and between other pairs of opposing edges which define open slits of the upper base of the main body; wherein said open slits communicate with the interior space of the orifice located in said upper base.

[0014] The rod of the long part comprises two pairs of collateral grooves between which are located some initial sections of the longitudinal flaps.

[0015] A lower face of the tightening part includes two opposing nerves which are complemented by two pairs of protrusions in opposition which start from the upper base of the main body; wherein, when the tightening part is located in an anchoring position in which the tightening part deforms the facing extensions causing the axial retention of the long part, the two opposing nerves click into place into each of the channels defined by these pairs of protrusions blocking the tightening part from turning.

[0016] The orifice of the tightening part is reinforced by two annular ribs corresponding to the upper and lower opposing faces of said tightening part. In turn, the opposing projections protrude above the annular rib disposed in the upper face of the tightening part.

[0017] Thus, in one embodiment the device of the invention is applicable to flushing mechanisms wherein the

link between the flushing mechanism and the push mechanism is a set of facing disks which should be regulated to the correct height: a disk which forms part of the push mechanism and the extreme disk which forms part of the long part, all according to the height of the cistern so that, once the regulation has been made, they should be perfectly fixed to prevent said regulation from being lost due to continued use.

[0018] The main body has been equipped with an elastic coupling mechanism comprising the two facing extensions which define the conduit through which the rod of the long part, which also includes the extreme activation disk on which the push mechanism disk has an impact when it is activated, shall move axially.

[0019] The way of locking the long part at the required height is achieved by means of the tightening part, so that once the long part has been axially positioned in the appropriate position, the tightening part turns one quarter turn, passing from an unlocked or inactive position to a locking or anchoring position in which the opposing projections of said tightening part are pressing against the external wings of the two facing extensions and the internal wings of said facing extensions are pressing against the transversal striations of the long part.

[0020] To regulate the height of the long part, firstly, once the flushing mechanism and the push mechanism have been installed in their respective locations, the cistern cover is positioned so that the push mechanism disk and the extreme disk of the long part are in contact, so that its rod slides axially to the upper operating limit of the flushing system to then activate the push mechanism so that the disks are located at the correct operating height.

[0021] In the next phase it is now possible to turn the tightening part to position the long part in its correct location.

[0022] With this simple operation the flushing mechanism has been perfectly regulated with total precision and its activation elements have been correctly locked to prevent said regulation from being lost through use.

[0023] It is worth pointing out that, although the push mechanism and the long part come into contact with each other by means of their respective disks, it is also possible for them to come into contact with each other by means of other different elements of the disks.

[0024] Below, to provide a better understanding of this description, and forming an integral part of the same, a series of figures, in which the object of the invention has been represented in an illustrative and non-limiting way, is enclosed.

BRIEF DESCRIPTION OF THE FIGURES

[0025]

Figure 1.- Shows an exploded view of the device for regulating the height of a cistern flushing mechanism, which is the object of the invention.

Figure 2.- Shows a view in sectional perspective of the device of the invention.

Figure 3.- Shows a perspective view of a main body which forms part of the cistern flushing mechanism, wherein said main body has a characteristic structure which forms part of the device of the invention.

Figure 4.- Shows a perspective view of a tightening part which forms part of the invention.

Figure 5.- Shows a perspective view of the application of the device of the invention.

DESCRIPTION OF AN EXAMPLE EMBODIMENT OF THE INVENTION

[0026] Bearing in mind the numbering adopted in the figures, the device for regulating the height of a cistern flushing mechanism comprises a long part (1), the height of which is regulatable, fitted inside a conduit (2) defined by two facing extensions (3), which comprise a wrap-around neck-like structure and which start from an upper base (4a) of a main body (4), which forms part of a cistern (6) flushing mechanism (5), said conduit (2) also passing through the upper base (4a) of the main body (4).

[0027] The two facing extensions (3) of the neck are separated by two opposing grooves, wherein said facing extensions (3) have upper edges wherein they form internal wings (3a) and external wings (3b), under which a tightening part (8), which has an orifice (9), is coupled around the two facing extensions (3) of the neck, wherein some outside faces of the two facing extensions (3) of the neck fit precisely into said orifice (9). Said opposing grooves also pass through the upper base (4a) of the main body (4) of the flushing mechanism (5), forming in said upper base (4a) two open slits (7) which form part of the aforementioned opposing grooves.

[0028] Said tightening part (8) is axially retained between the upper base (4a) of the main body (4) and the external wings (3b) of the two facing extensions (3). Whereas the internal wings (3a) of said facing extensions (3) are in contact with the long part (1).

[0029] Said long part (1) can be firmly anchored in different positions to locate an upper edge of the long part (1) which faces a lower edge of a push mechanism (19) fitted in a cover (6a) of the cistern (6), so that by pressing said push mechanism (19) it moves the main body (4) of the flushing mechanism (5) downwards through the mediation of the long part (1), thus causing the cistern (6) to empty through its outlet pipe.

[0030] The long part (1) comprises a rod (1 a) and an extreme disk (1 b) with which a part of the push mechanism comes into contact when it is pressed in order to activate the flushing mechanism (5) and empty the cistern (6). The rod (1 a) of the long part (1) has two transversal striations (10) and two longitudinal flaps (1 1) disposed in a plane which is perpendicular to the plane

wherein the transversal striations (10) are found, so that the longitudinal flaps (11) fit into the opposing grooves to guide the movement of the long part (1) when it comes to positioning it at the required height. The rod (1a) of the long part (1) comprises two pairs of collateral grooves (12) between which some initial sections of the longitudinal grooves (11) are located.

[0031] The transversal striations (10) of the long part (1) face the internal wings (3a) of the two facing extensions (3), so that the tightening part (8) being in an anchoring position, some sharp edges of the internal wings (3a) of the facing extensions (3) press in opposition against the two transversal striations (10) of the long part (1). In this anchoring position, the tightening part (8) presses against the external wings (3b) of the facing extensions (3) through the mediation of two opposing projections (13) which protrude above an upper face of the tightening part (8) and which are adjacent to the orifice (9) of said tightening part (8).

[0032] Whereas, a lower face of the tightening part (8) opposed to the upper face, includes two nerves (14) in opposition which are complemented by two pairs of protrusions (15) in opposition which start from the upper base (4a) of the main body (4), so that when the tightening part (8) is located in the anchoring position, the two nerves (14) click into place into each of the channels (16) defined by these protruding pairs (15), thus ensuring said anchoring position.

[0033] To lock and unlock the anchoring position of the long part (1) it is necessary to turn the tightening part (8) with enough force for it to deform elastically when the nerves (14) come into contact with the protrusions (15) of the upper base (4a) of the main body (4) of the flushing mechanism (5). During this operation, the two facing extensions (3) in contact with the main body (4) of the flushing mechanism (5) also deform elastically inwards.

[0034] On the other hand, to pass from an inactive position to an active position wherein the long part (1) is locked axially, the tightening part (8) turns until the opposing projections (13) of the tightening part (8) come into radial contact with the two external wings (3b) of the facing extensions (3) and the nerves (14) of the tightening part (8) fit into the channels (15) defined by the pairs of protrusions (15) of the main body (4) of the flushing mechanism (5).

[0035] When the tightening part (8) is in an inactive position, its opposing projections (13) are not in contact with the external wings (3b) of the two facing extensions (3) which form part of the main body (4) of the flushing mechanism (5) and therefore the long part (1) can move axially to locate it at the required height, since in said inactive position, the two internal wings (3a) are not pressing against the two transversal striations (10) of the long part (1).

[0036] On the other hand, the orifice (9) of the tightening part (8) is reinforced by two annular ribs (17), (18) corresponding to the upper and lower faces of said tightening part (8), respectively; wherein the opposing pro-

jections (13) protrude above the annular rib (17) disposed in the upper face of the tightening part (8).

[0037] In one embodiment, the device of the invention is applicable to flushing mechanisms (5) wherein the link between the flushing mechanism (5) and the push mechanism (19) is a set of facing disks which should be regulated to the correct height: a disk (19a) which forms part of the push mechanism (19) and the extreme disk (1b) which forms part of the long part (1), all of which according to the height of the cistern (6), so that once the regulation has been made, they should be perfectly fixed to prevent said regulation from being lost due to continued use.

Claims

1. DEVICE FOR REGULATING THE HEIGHT OF A CISTERN FLUSHING MECHANISM, which comprises a long part fitted inside a centred hole which passes through an upper base (4a) of a main body (4) of the flushing mechanism (5), wherein the position of said long part is axially regulatable and wherein the long part is associated with a part of a push mechanism (19) which, when activated, moves the main body (4) of the flushing mechanism (5) downwards through the long part; characterised because:

- the centred hole of the main body (4) of the flushing mechanism (5) comprises a conduit (2) defined by two facing extensions (3) which start from the upper base (4a) of the main body (4), the upper base (4a) of the main body (4) also passing through said conduit (2); the two facing extensions (3) are fitted inside a circular orifice (9) made up of a tightening part (8) coupled around said facing extensions (3); wherein some outside faces of the facing extensions (3) are in contact with the edge of the orifice (9) of the tightening part (8), which has gyratory mobility around the facing extensions (3);
- the two facing extensions (3) have inner opposing portions which face opposite portions of the long part (1); wherein in a lock position of the long part (1), the tightening part (8) deforms the facing extensions (3) causing the axial retention of the long part (1) through the mediation of the inner opposing portions of the two facing extensions (3), and, in a release position, the tightening part (8) does not deform the facing extensions (3), the long part (1) having axial mobility.

2. DEVICE FOR REGULATING THE HEIGHT OF A CISTERN FLUSHING MECHANISM, according to claim 1, characterised because upper edges of the facing extensions (3) have internal wings (3a) facing the opposing portions of the long part (1), and other external wings (3b); wherein the tightening part (8)

is axially retained between the upper base (4a) of the main body (4) and the external wings (3b) of the two facing extensions (3).

3. DEVICE FOR REGULATING THE HEIGHT OF A CISTERN FLUSHING MECHANISM, according to claim 2, characterised because the tightening part (8) incorporates two opposing projections (13) which protrude above an upper face of said tightening part (8) and which are at the height of the external wings (3b) of the facing extensions (3); wherein, in the locking position of the long part (1), said projections (13) press against the external wings (3b) through the mediation of two opposing projections (13) which protrude above the upper face of the tightening part (8); and wherein, in the release position of the long part (1), the opposing projections (13) are not in contact with said external wings (3b) of the facing extensions (3).
4. DEVICE FOR REGULATING THE HEIGHT OF A CISTERN FLUSHING MECHANISM, according to claim 3, characterised because the opposing projections (13) of the facing extensions (3) are adjacent to the orifice (9) of the tightening part (8); wherein some internal areas of the projections (13) are a continuation of the annular surface which defines the orifice (9) of the tightening part (8).
5. DEVICE FOR REGULATING THE HEIGHT OF A CISTERN FLUSHING MECHANISM, according to claim 1, characterised because: the long part (1) comprises a rod (1 a) consisting of two transversal striations (10) and two longitudinal flaps (1 1) disposed in a perpendicular plane with respect to the plane in which the transversal striations (10), which face the inner opposing portions of the two facing extensions (3) in contact with the main body (4) of the flushing mechanism (5), are found; the longitudinal flaps (1 1) fit into opposing grooves as a means of guiding the axial movement of the long part (1) when it comes to positioning it at the required height.
6. DEVICE FOR REGULATING THE HEIGHT OF A CISTERN FLUSHING MECHANISM, according to claim 5, characterised because the opposing grooves are defined between pairs of opposing edges of the facing extensions (3) and between pairs of opposing edges which define open slits (7) of the upper base (4a) of the main body (4); wherein said open slits (7) communicate with the interior space of the orifice (9) located in said upper base (4a).
7. DEVICE FOR REGULATING THE HEIGHT OF A CISTERN FLUSHING MECHANISM, according to claim 5, characterised because the rod (1 a) of the long part (1) comprises two pairs of collateral grooves (12) between which some initial sections of

the longitudinal flaps (1 1) are located.

8. DEVICE FOR REGULATING THE HEIGHT OF A CISTERN FLUSHING MECHANISM, according to claim 1, characterised because a lower face of the tightening part (8) includes two nerves (14) in opposition which are complemented by two pairs of protrusions (15) in opposition which protrude from the upper base (4a) of the main body (4); wherein the tightening part (8) is located in an anchoring position wherein the tightening part (8) deforms the facing extensions (3) causing the axial retention of the long part (1), the two nerves (14) in opposition click into place into each channel (16) defined by these pairs of protrusions (15) blocking the tightening part (8) from turning.
9. DEVICE FOR REGULATING THE HEIGHT OF A CISTERN FLUSHING MECHANISM, according to claim 1, characterised because the orifice (9) of the tightening part (8) is reinforced by two annular ribs (17), (18), corresponding to the upper and lower opposing faces of said tightening part (8).
10. DEVICE FOR REGULATING THE HEIGHT OF A CISTERN FLUSHING MECHANISM, according to claims 3 and 9, characterised because the opposing projections (13) protrude above the annular rib (17) disposed in the upper face of the tightening part (8).
11. DEVICE FOR REGULATING THE HEIGHT OF A CISTERN FLUSHING MECHANISM, according to claim 1, characterised because the link between the flushing mechanism (5) and the push mechanism (19) is a set of facing disks: a disk (19a) which forms part of the push mechanism (19) and an extreme disk (1 b) which forms part of the long part (1).

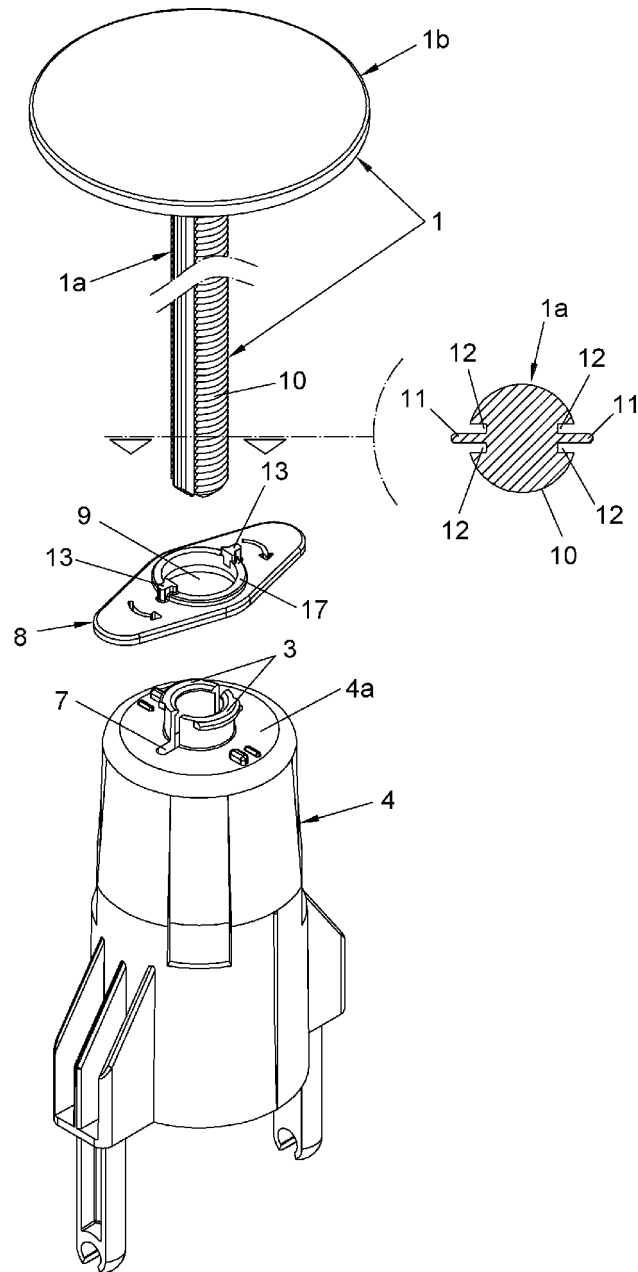


FIG. 1

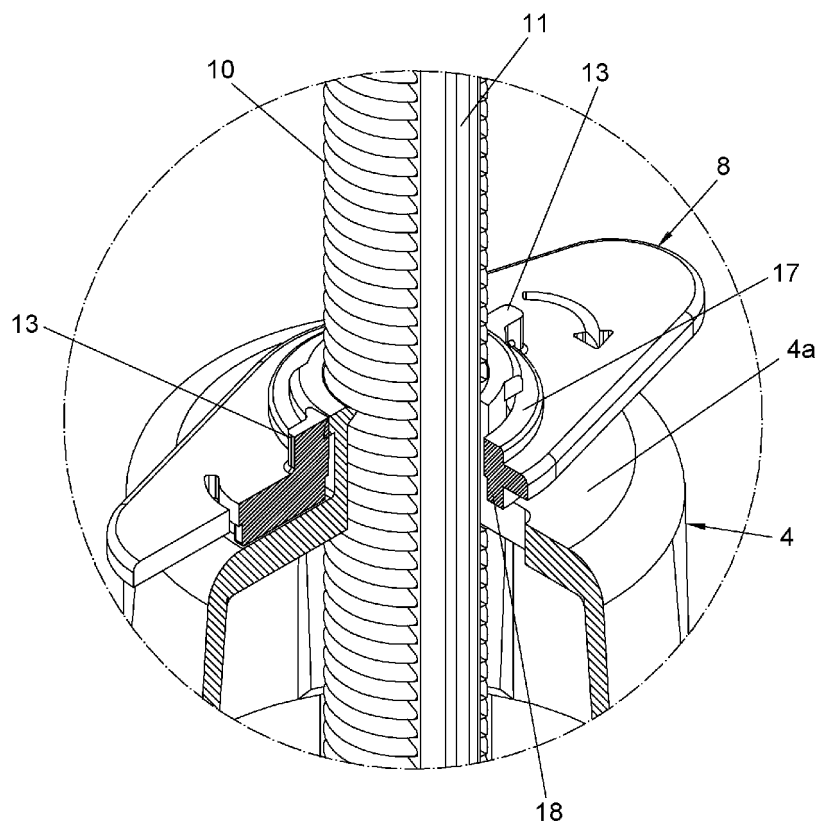


FIG. 2

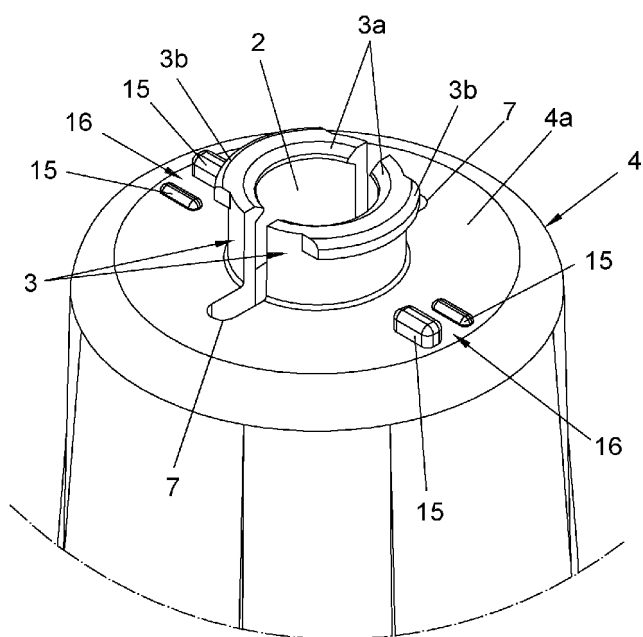


FIG. 3

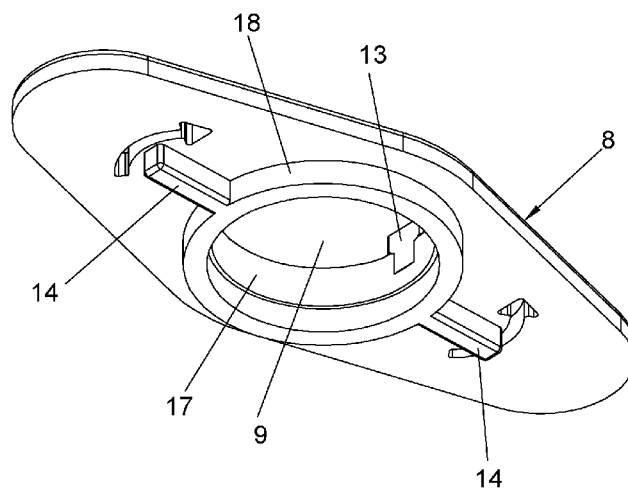


FIG. 4

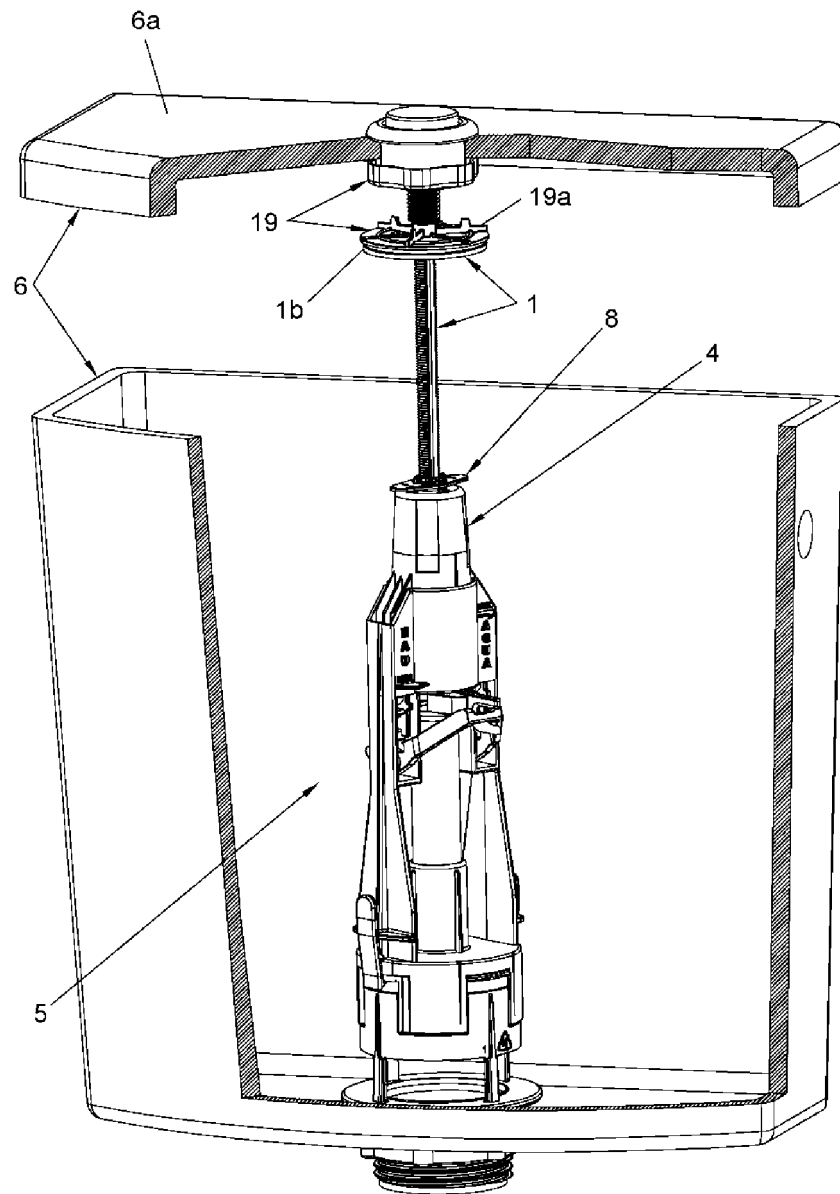


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2016/070738

A. CLASSIFICATION OF SUBJECT MATTER

E03D1/24 (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

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Y	ES 1053738U U (FOMINAYA SA) 01/05/2003, column 3, line 56 - column 6, line 21; figures 1-8	1, 2, 11
A		3-10
Y	ES 2258900 A1 (FOMINAYA SA) 01/09/2006, column 3, line 29 - column 4, line 31; figures 1 - 2.	1, 2, 11
A		3-10
A	ES 2116565T T3 (GEBERIT TECHNIK AG) 16/07/1998, column 2, line 31 - column 4, line 57; figures 1 - 4.	1-11
A	EP 1310603 A1 (IDROLS SA) 14/05/2003, figures 1 - 8. claims 1-6;	1-11

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search
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(16/01/2017)

Name and mailing address of the ISA/

Authorized officer
S. De Miguel De Santos

OFICINA ESPAÑOLA DE PATENTES Y MARCAS
Paseo de la Castellana, 75 - 28071 Madrid (España)
Facsimile No.: 91 349 53 04

Telephone No. 91 3493270

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2016/070738

C (continuation).	DOCUMENTS CONSIDERED TO BE RELEVANT	
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REFERENCES CITED IN THE DESCRIPTION

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