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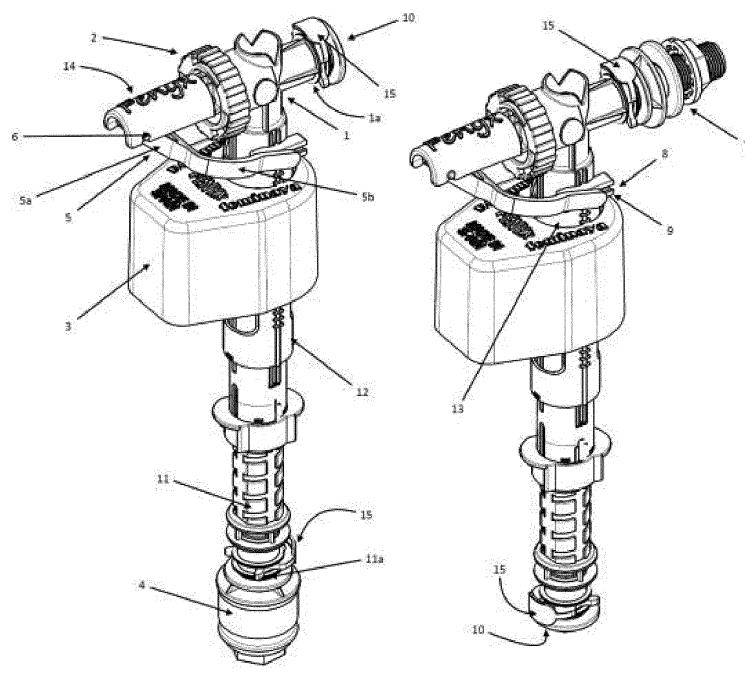
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(54) **INLET VALVE FOR CISTERNS**

(57) A cock for filling cisterns wherein a free edge (1a) of the hollow head (1) and the free and lower edge (11a) of the vertical tube (11) are configured to receive indistinctly coupling means (4, 7) with an external water inlet and means for closing (10) said free edges (1a, 11a) in such a way that a means for closing (10) is inserted into the free edge (1a, 11a) opposite the free edge (1a,

11a) where one of the coupling means (4, 7) is inserted; and because it also comprises a means for blocking (15, 16) configured to fix the position of the coupling means (4, 7) and the means for closure (10), blocking their axial movement in the free edge (1a) of the hollow head (1) and in the free lower edge (11a) of the vertical tube (11) respectively.

**FIG.1**

Description**TECHNICAL FIELD OF THE INVENTION**

[0001] This invention refers to a cock for filling cisterns according to the preamble of claim 1. Thus, the invention focuses on means facilitating the use of the cock as (a) a lateral cock; or (b) a lower extendable cock.

STATE OF THE PRIOR ART

[0002] Numerous cocks for filling cisterns are currently known which generally comprise a water inlet into which a valve device that either allows or blocks the passage of water into the space inside the cistern is inserted, in such a way that the valve device is linked to a float, which rises and falls according to the level of the water inside the cistern, in such a way that once the desired water level has been reached inside the cistern, the valve device is closed, thereby interrupting the passage of water into the inside of the cistern.

[0003] Whereas documents ES2239877 and ES2353475 refer to cocks for filling cisterns, wherein the float is coupled around a vertical guide, in such a way that the height of the float may be adjusted by means of a threaded rod. By rotating the threaded rod in one direction or another achieves locating the float at the required height to fill the cistern with a greater or lesser volume of water.

[0004] Document EP 0 943 851 describes a float valve for accumulating water in a lavatory cistern, and comprising a valve body connected to a rigid downwardly-extending tube; a movable shutter for closing said valve; a chamber connected to said tube and containing a float movable vertically with respect to the chamber; mechanical elements for transmitting movement between said float and said shutter; and an adjusting device for adjusting the water level corresponding to closure of said shutter; said adjusting device comprises a single element activated manually to adjust both the position of said chamber and said mechanical elements.

[0005] Document EP 2 312 067, on the other hand, describes an adjustable cock for filling lavatory cisterns based on the fact that the telescopic water inlet pipe is made up of three bodies connected together telescopically, one as an inside tube through which the fastening at the bottom of the lavatory cistern is performed, another one as a middle tube externally coupled to the inside tube and coupled thereto through the bottom edge, and the third one externally installed on the middle tube, with the capacity for axial movement from the latter. Said third body, hereinafter called the outside body, has a lower tubular section with axial recesses into which complementary projections made for this purpose in the lower section of the middle tube are fastened, allowing the axial movement of said outside body, which continues from said lower tubular section in a pair of diametrically-opposed axial sectors, the latter reaching a circumferential-

ly-closed middle section, but with lower axial extensions sandwiched between the above-mentioned axial sectors, in one axial extension of which a side of the middle tube is positioned in order to prevent the rotation thereof with respect to the outside body.

[0006] Document EP 0 458 401 describes a float valve with level adjustment, especially for water storage cisterns in sanitary systems, comprising an inlet body capable of being connected to the water supply network, positioned horizontally inside a cistern and equipped with a lifting device with a vertical axis, capable of being connected to a chamber containing a slidable float connected, by mechanical transmission and gearing means for the buoyancy thrust from the float, to a closure element slidably housed in said body and capable of creating a seal against a seating that has a small aperture positioned inside the body when the float is in a raised position, in which apparatus the lifting device is mounted outside the chamber and between them is constituted, by means of a coupling and guiding means, a relative linear sliding between said chamber and said lifting device for the purpose of achieving, with appropriate blocking of said device, the adjustment of the level of the edge of the chamber with respect to the bottom of the cistern, and in said device the means for transmitting the buoyancy thrust in the closure element, for shutting off the water supply, comprises at least one element that is adjustable in length to keep the stroke of the closure element constant as the level of the chamber varies.

[0007] Finally, document EP3101322 is considered to be the most representative of the state of the prior art to the cock that is the object of this invention. This document, which is from the same applicant and inventor, discloses all the technical characteristics mentioned in the preamble of claim 1, but does not describe any means enabling the cock to be converted into a lateral cock or a lower extendable inlet cock.

DESCRIPTION OF THE INVENTION

[0008] The object of this invention is a cock for filling cisterns comprising a hollow head inside which a valve device linked to a float by means of an intermediate device is housed, also comprising a vertical tube connected to the hollow head and which is characterised in that one free edge of the hollow head and the free lower edge of the vertical tube are configured to receive indistinctly means for coupling with an external water inlet and the means for closing said edges, at least one closure means in the free edge to the edge where the coupling means has been positioned; and which also comprises blocking means configured to fasten the position of the coupling means and the closure means in the free edge of the hollow head and the lower free edge of the vertical tube. The blocking means are configured to block its axial movement once the cock is installed in the cistern, preventing movements of the main body of the cock that may cause incorrect functioning.

[0009] In a particular embodiment, the blocking means comprises, at least, one blocking clamp configured to block linear axial movement and a blocking lug configured to block circular axial movement.

[0010] Thanks to this structure, it is possible that, with the body of the cock itself, they can be mounted on a lateral inlet cock or a lower inlet cock, which results in lower production and storage costs, since, with a single type of cock, simply locating the coupling means on one free edge and the closure means on the other free edge, it is possible to have one type of cock or another.

[0011] In a particular embodiment, the means for coupling with an external inlet comprises a lower cock connector and/or a lateral cock connector. On the other hand, in another particular embodiment, the closure means is a dimensionally suitable cover for coaxial coupling with the edge of the hollow head and/or the lower edge of the vertical tube.

[0012] In another particular embodiment, the lower cock connector is an essentially cylindrical body comprising a first coupling zone that is dimensionally suitable for its coaxial insertion into the lower edge of the vertical tube; and a second zone for extendable adjustment, in such a way that said connector remains jointly connected to an external water inlet, enabling the passage of water between the external water inlet and the vertical tube through an internal pipe.

[0013] In another embodiment, the lateral water connector is an essentially cylindrical body comprising a first coupling zone that is dimensionally suitable for its insertion into the free edge of the hollow edge; and a second zone connecting to an external water supply enabling the passage of water between said external inlet and the free edge of the hollow head through an internal pipe.

[0014] Throughout the description and the claims, the word «comprises» and its variants do not purport to exclude other technical characteristics, additives, components or steps. For those skilled in the art, other objects, benefits and characteristics of the invention will be deduced partly from the invention and partly from putting the invention into practice. The following examples and drawings are provided for illustrative purposes and do not purport to restrict this invention. Furthermore, the invention covers all the possible and preferred embodiments indicated herein.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The following very briefly describes a series of drawings that help to understand the invention better and expressly refer to one embodiment of said invention, which is shown as a non-limiting example of the same.

FIG.1 shows two perspective views of the cock for filling cisterns, that is the object of the invention wherein figure 1 shows the lower coupling and the cover on the lateral cock, while figure 1b shows the lateral cock and the cover on the lower inlet.

FIG.2 shows a perspective and exploded view in detail of the insertion of the closure cover into the lateral inlet according to one embodiment of the cock for filling cisterns that is the object of the invention.

FIG.3 shows a perspective and exploded view in detail of the insertion of the closure cover into the lower inlet according to one embodiment of the cock for filling cisterns that is the object of the invention.

FIG.4 shows a perspective and exploded view in detail of the insertion of the lateral cock connector into the lateral inlet according to one embodiment of the cock for filling cisterns that is the object of the invention.

FIG.5 shows a perspective and exploded view in detail of the insertion of the lower cock connector into the lower inlet according to one embodiment of the cock for filling cisterns that is the object of the invention.

FIG.6 shows a second perspective and exploded view in detail of the insertion of the lower cock connector into the lower inlet according to one embodiment of the cock for filling cisterns that is the object of the invention.

[0016] Regarding the numbering adopted in the figures, the cock for filling cisterns is described below according to the following numerical references and associated nomenclature:

1. Hollow head with a free edge (1a)
2. Valve device
3. Float
4. Lower cock connector with a first zone (4a) and a second zone (4b)
5. Rocker arm with a front fork (5a) and a double rear extension (5b)
6. Articulated connection
7. Lower cock connector with a first zone (7a) and a second zone (7b)
8. Grooves
9. Parallel runners
10. Cover with a first zone (10a) and a second zone (10b)
11. Vertical tube with a free edge (11a)
12. Bush
13. Central passage
14. Rod
15. Linear axial blocking clamps
16. Circular axial blocking lug

DETAILED DESCRIPTION OF ONE EMBODIMENT OF THE INVENTION

[0017] As can be seen in the enclosed figures and,

particularly in figure 1, the cock for filling cisterns that is the object of the invention comprises a hollow head (1) inside which is housed a valve device (2) linked to a float (3) by means of an intermediate device, in such a way that as the cistern fills up with water, the latter pushes the float (3) upwards, this movement being transmitted to the valve device (2) which progressively shuts off the passage of the water until the passage is definitively interrupted, either by means of a lower cock (figure 1a) or a lateral inlet (figure 1b).

[0018] When the cistern is flushed, the float (3) drops down, freeing up the passage of water through the valve device (2) in such a way that, as the cistern begins to fill up again, the passage of the water is shut down, as indicated.

[0019] Hence, the cock for filling cisterns that is the object of the invention comprises a rod (14) and a hollow head (1), inside which a valve device (2) is housed, that is linked to a float (3) via an intermediate device, also comprising a vertical tube (11) connected to the hollow head (1); the vertical tube (11) being housed inside a central passage (13) of the float (3), which moves up and down as the water level of the cistern rises and falls. The float (3) is also connected to a bush (12) coaxially coupled around the vertical tube (11), along which the bush (12) moves axially and freely.

[0020] The cock of the invention is characterised in that both the free edge (1a) of the hollow head (1), and the free edge (11a) of the vertical tube (11) are equipped to receive indistinctly both the means for coupling (4,7) to an external water inlet, and the means for closing (10) said free edges (1a, 11a).

[0021] Said means for coupling (4,7) are of two types: a lower cock connector (4) and a lateral cock connector (7). However, the means of closure consist of a cover (10) that is dimensionally suitable for its coaxial coupling to said free edges (1a, 11a) indistinctly and inversely with respect to the coupling means (4,7), i.e. if the lower cock connector (4) is connected to the free edge (11a) of the vertical tube (11), then the free edge (1a) of the hollow head (1) will receive said cover (10) and vice versa.

[0022] Figures 2 and 3 show, in a non-limiting way, the cover in this practical embodiment, with a first zone (10a) with a smaller diameter than a second zone (10b) in such a way that the first zone (10a) has a diameter that allows its coaxial insertion into the free edges (1a, 11a) while the second zone (10b) has a diameter so that it totally closes said free edges (1a, 11a).

[0023] On the other hand, figures 4 and 5 show, in a non-limiting way, the coupling means (4,7). More specifically, the lower cock connector (4) consists of an essentially cylindrical body comprising a first coupling zone (4a) that is dimensionally suitable for its coaxial insertion into the lower free edge (11a) of the vertical tube (11); and a second extendable adjustment zone (4b) in such a way that said lower cock connector (4) remains jointly connected to an external water inlet, enabling the passage of water between the external water inlet and the vertical

tube (11) through an internal pipe.

[0024] On the other hand, the lateral cock connector (7) similarly consists of an essentially cylindrical body comprising a first coupling zone (7a) that is dimensionally suitable for its coaxial insertion into the free edge (1a) of the hollow head (1); and a second coupling zone (7b) connected to an external water inlet enabling the passage of water between said external inlet and the free edge (1a) of the hollow head (1) through an internal pipe.

[0025] In the example of one practical embodiment of the invention shown in the enclosed figures, the cock for filling cisterns that is the object of the invention comprises blocking clamps (15) and blocking lugs (16) configured to fix the position of the coupling means (4,7) and the closure means (10) in the free edges (1a, 11a) of the hollow head (1) and the vertical tube (11) respectively. The blocking clamps (15) in one non-limiting practical embodiment, are «U-shaped», wherein the lateral branches are in the shape of a concave-convex curve, while the central zone is significantly wider than the lateral branches to thus facilitate its insertion into the free edges (1a, 11a) and its subsequent retaining action on the coupling (4,7) or closure means (10) thus limiting the linear axial movement of the assembly. On the other hand, the blocking lugs (16) limit the circular axial movement of the coupling (4,7) or closure means (10), completely fixing the assembly in all its possible degrees of freedom as can be appreciated by means of the arrows shown in figure 6.

[0026] With reference once more to figure 1, the bush (12) incorporates parallel runners (9), in such a way that the bush (12) is guided and moved vertically along grooves arranged along the length of the vertical tube (11). The parallel runners (9) are linked to a rocker arm (5) that is coupled to the hollow head (1) by means of an articulated connection (6). On the other hand, one edge of the rod (14) is connected to the rocker arm (5) by means of an articulated front connection, while an opposing edge of the rod (14) is connected to a push piston via a rear articulated connection, the push piston (14) being linked to the valve device (2).

[0027] The one-way tilting of the rocker arm (5) axially displaces the push piston (4) against the valve device (2) towards a closed position. The rocker arm (5) comprises a front fork (5a) the edges of which are guided along grooves (8) in the parallel runners (9) located in the upper part of the bush (12), while the rocker arm (5) comprises a double rear extension (5b) which couples along its free edge to one part of the hollow head (1) by means of an articulated connection (6), at the same time as, in said double rear extension (5b) the rod (14) also couples along its front articulated connection.

[0028] Once the cistern is flushed, the operation process is inverted, i.e. the float (4) moves downwards dragging the assembly of the bush (12) and parallel runners (9) along with it, moving downwards as a result of gravity, dragging down, in turn, the rocker arm (5), which tilts in the opposite direction to the one described during the

filling of the cistern, which frees up the axial thrust on the push piston which will move thus freeing up the valve device (2) which will once again allow the passage of water through it.

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Claims

1. A cock for filling cisterns comprising a hollow head (1) inside which a valve device (2) is housed linked to a float (3) by means of an intermediate device, further comprising a vertical tube (11) connected to the hollow head (1) and **characterised in that** a free edge (1a) of the hollow head (1) and the free lower edge (11a) of the vertical tube (11) are configured to receive indistinctly the means for coupling (4,7) to an external water inlet and closure means (10) of said free edges (1a, 11a), in such a way that a closure means (10) is inserted into the free edge (1a, 11a) opposite the free edge (1a, 11a) where one of the coupling means (4,7) is inserted; and also **in that** it comprises blocking means (15,16) configured to fix the position of the coupling means (4,7) and the closure means (10), blocking their axial movement in the free edge (1a) of the hollow head (1) and in the lower free edge (11a) of the vertical tube (11) respectively. 10
2. The cock according to claim 1 wherein the blocking means (15,16) comprise, at least, one blocking clamp (15) configured to block the linear axial movement and a blocking lug (16) configured to block the circular axial movement. 30
3. The cock according to either claim 1 or 2 wherein the coupling means with an external inlet comprise a lower cock connector (4) and a lateral cock connector (7). 35
4. The cock according to any of the previous claims wherein the closure means are a cover (10) that is dimensionally suitable for its coaxial coupling with the free edge (1a) of the hollow head (1) and/or the free lower edge (11a) of the vertical tube (11). 40
5. The cock according to any of the previous claims wherein the lower cock connector (4) is an essentially cylindrical body comprising a first coupling zone (4a) that is dimensionally suitable for its coaxial insertion into the free lower edge (11a) of the vertical tube (11); and a second extendable adjustment zone (4b), in such a way that said lower cock connector (4) remains jointly connected to an external water inlet, enabling the passage of water between the external water inlet and the vertical tube (11) through an internal pipe. 50
6. The cock according to any of the previous claims 55

wherein the lateral cock connector (7) is an essentially cylindrical body comprising a first coupling zone (7a) that is dimensionally suitable for its coaxial insertion into the free edge (1a) of the hollow head (1); and a second coupling zone (7b) connected to an external water inlet enabling the passage of water between said external inlet and the hollow head (1) through an internal pipe.

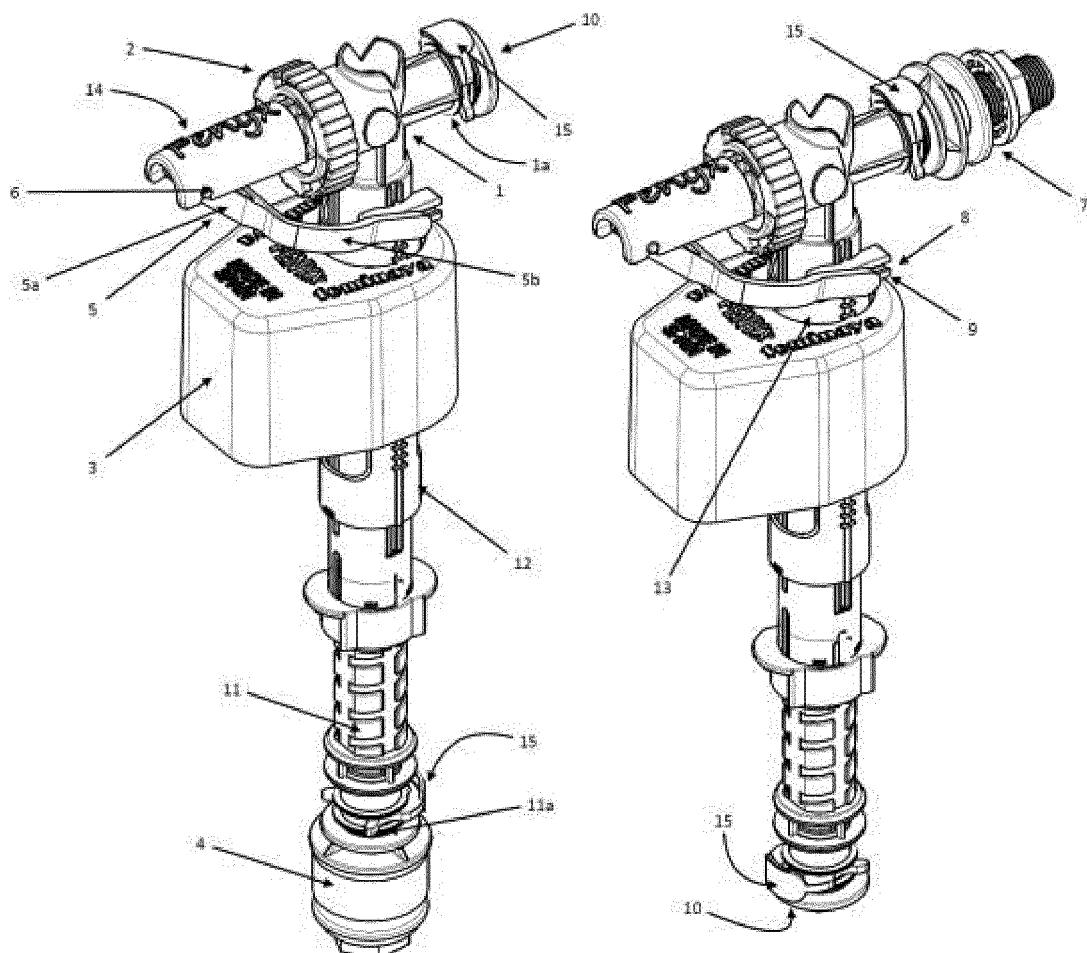


FIG.1A

FIG.1B

FIG.1

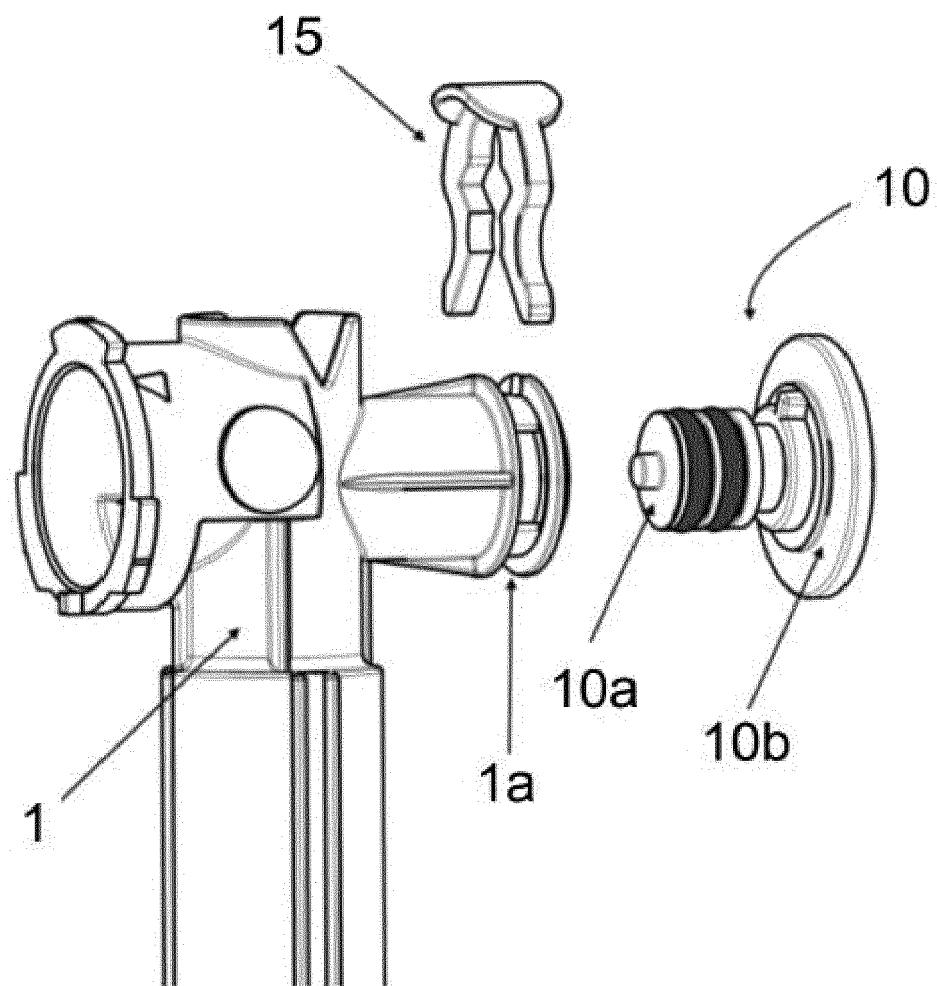


FIG.2

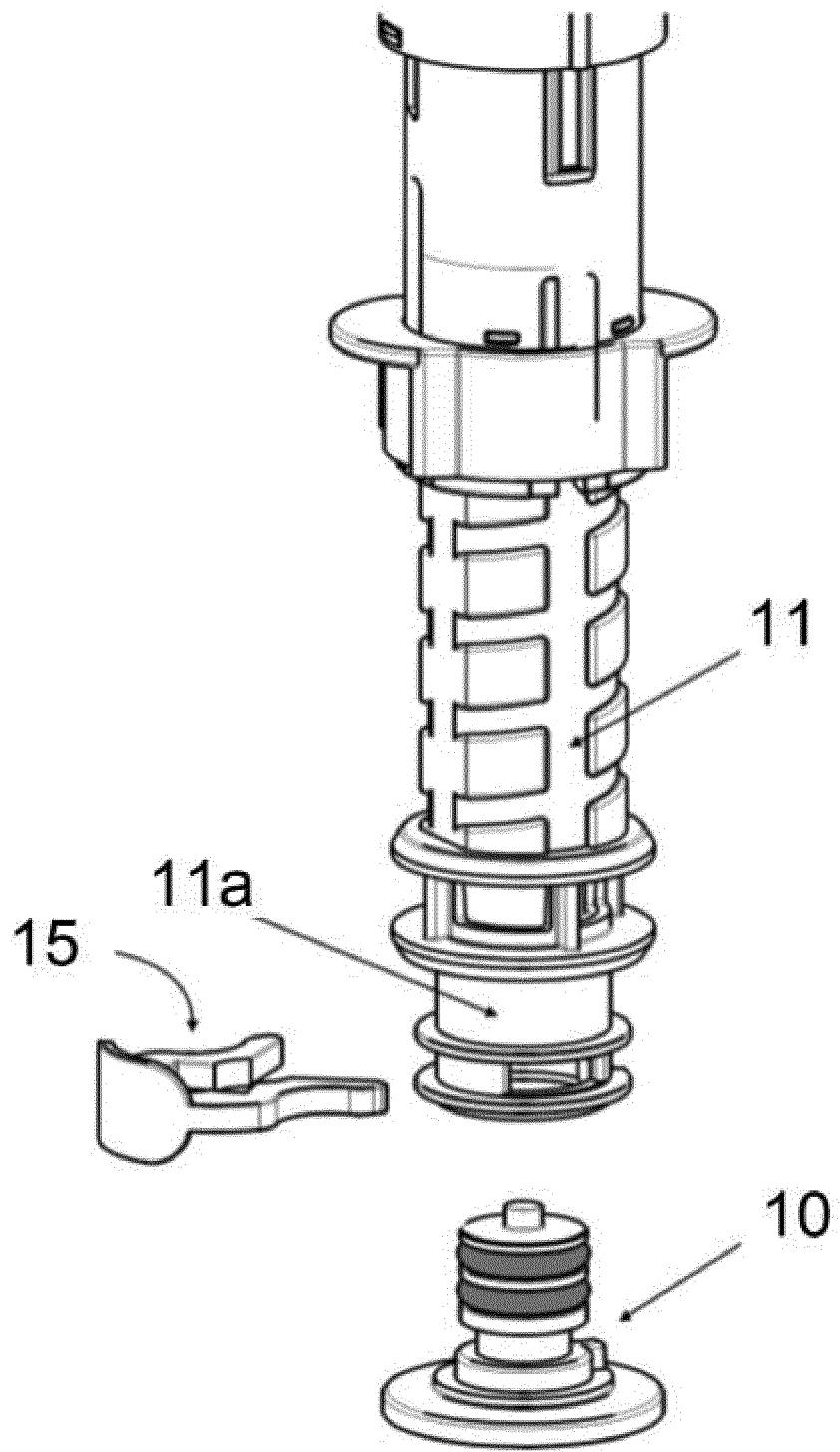


FIG.3

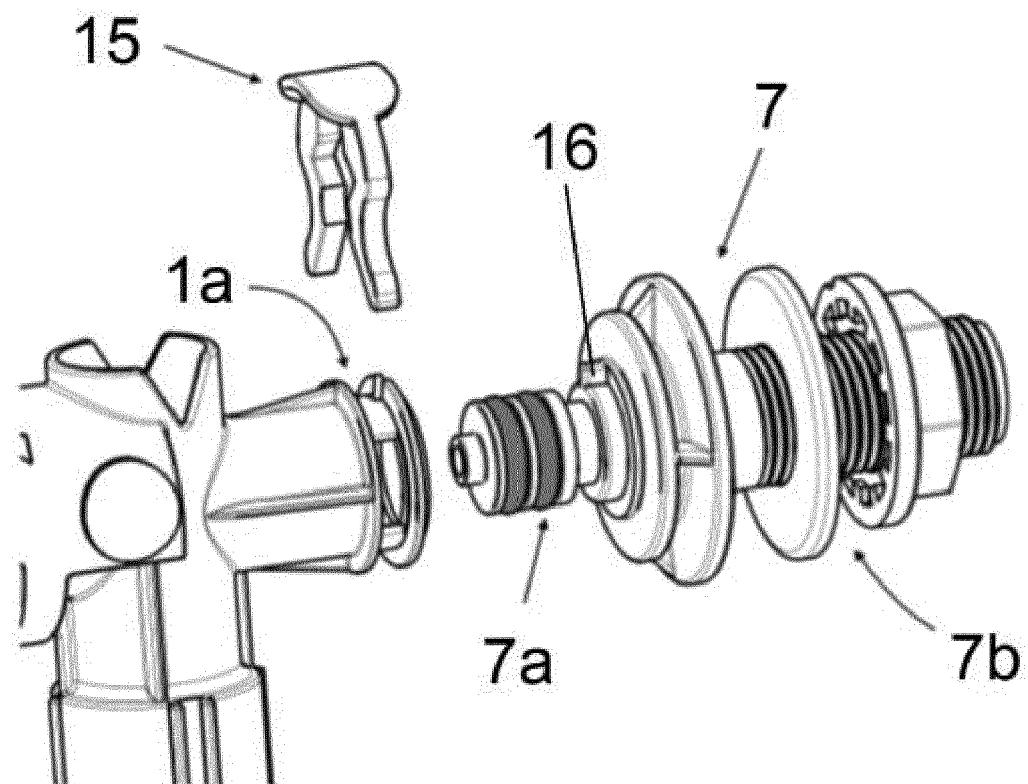


FIG.4

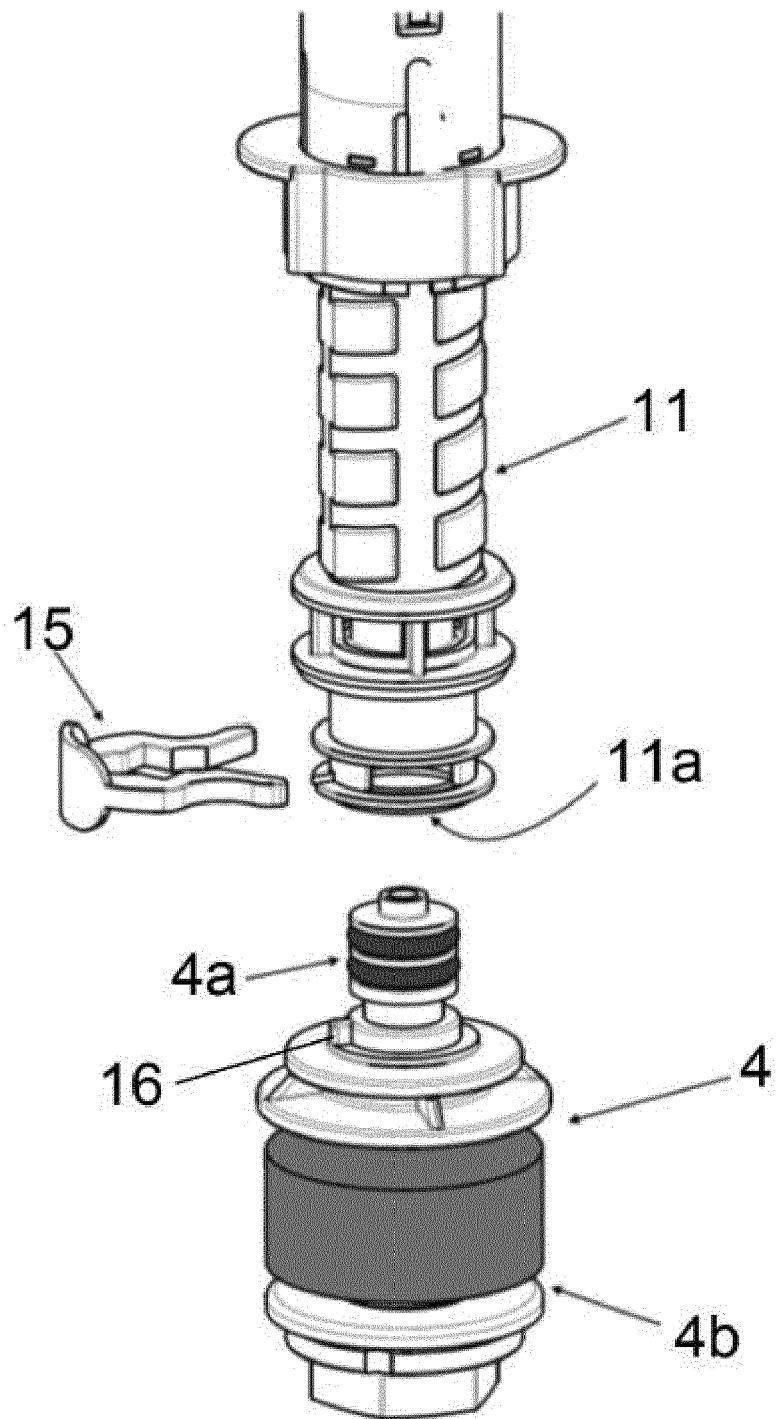


FIG.5

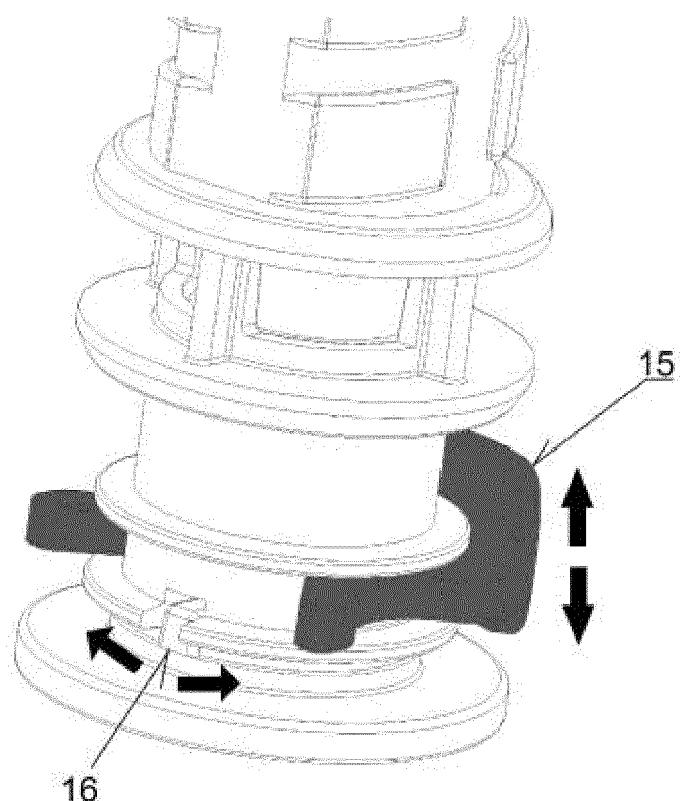


FIG.6



EUROPEAN SEARCH REPORT

Application Number

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 207 848 536 U (XIAMEN YINGGE SANITARY WARE CO LTD) 11 September 2018 (2018-09-11) * claim 1; figures 1-3 *	1,3-6	INV. E03D1/32
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			TECHNICAL FIELDS SEARCHED (IPC)
			E03D
The present search report has been drawn up for all claims			
1	Place of search Munich	Date of completion of the search 20 August 2019	Examiner Flygare, Esa
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10	Patent document cited in search report	Publication date	Patent family member(s)	Publication date
15	CN 207848536	U 11-09-2018	NONE	
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REFERENCES CITED IN THE DESCRIPTION

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