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(54) **FLUSHING CISTERN FOR SANITARY FIXTURES**

(57) A flushing cistern (1) for sanitary fixtures, comprising a cistern body (2) which accommodates internally a flow control element (9) adapted to allow the opening/closing of the water discharge passage, the cistern comprising at least one servomotor (6) adapted to lift/lower the flow control element, which is actuated by at least one touch-sensitive button (4,5) arranged on a covering plate (3) of the cistern.

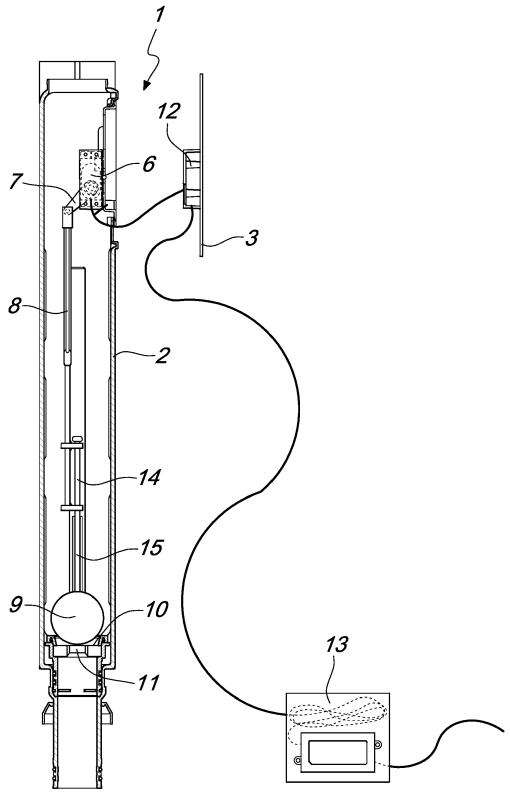

Fig. 2

EP 3 020 879 A1

Description

[0001] The present invention relates to a flushing cistern for sanitary fixtures. More particularly, the invention relates to a flushing cistern for sanitary fixtures that has improved ease of use for users.

[0002] It is known that the flow of flushing water of sanitary fixtures is usually controlled by using flushing cisterns, which can be either recessed in a wall or external, and are provided with at least one button, and preferably a pair of buttons, in order to select the desired amount of water to use to flush the sanitary fixture.

[0003] These cisterns are provided externally with a covering plate that accommodates the actuation button of the internal device, which is provided by means of mechanical lever systems and actuates the flow control element, such as for example a ball, which, when raised, allows discharge and therefore the outflow of the rinsing water.

[0004] Plates and cisterns of the known type are therefore provided with mechanical systems and the button must be actuated by the user by pressing with his/her hand said button so as to actuate the lever system that is connected to the button and allows the outflow of the water in the desired amount depending on the button of the cistern that is pressed by the user.

[0005] Solutions of the known type, while being efficient from the point of view of the water discharge operation, are not extremely attractive from a technological standpoint, since the outflow of the water is entrusted to the actuation of a mechanical button, which makes the cistern of the known type scarcely technological.

[0006] The aim of the present invention is to provide a flushing cistern for sanitary fixtures in which the actuation of the water discharge buttons is independent of the mechanical concept used so far.

[0007] Within this aim, an object of the present invention is to provide a flushing cistern for sanitary fixtures in which the user does not have to press a button to initiate the discharge of water.

[0008] Another object of the present invention is to provide a flushing cistern for sanitary fixtures in which the thickness of the plate can be reduced to a minimum.

[0009] Another object of the present invention is to provide a flushing cistern for sanitary fixtures that is highly reliable, relatively simple to provide and at competitive costs.

[0010] This aim, as well as these and other objects that will become better apparent hereinafter, are achieved by a flushing cistern for sanitary fixtures, comprising a cistern body which accommodates internally a flow control element adapted to allow the opening/closing of the water discharge passage, characterized in that it comprises at least one servomotor adapted to lift/lower said flow control element, said flow control element being actuated by at least one touch-sensitive button arranged on a covering plate of said cistern.

[0011] Further characteristics and advantages of the invention will become better apparent from the description of a preferred but not exclusive embodiment of the cistern according to the present invention, illustrated by way of nonlimiting example in the accompanying drawings, wherein:

Figure 1 is a front view of the cistern according to the present invention;

Figure 2 is a sectional side view of the cistern according to the present invention;

Figure 3 is a rear sectional view of the cistern according to the invention;

Figure 4 is a front view of the plate adapted to be used with the cistern according to the invention.

[0012] With reference to the figures, the cistern according to the invention, designated generally by the reference numeral 1, comprises a cistern body 2 that is adapted for example to be recessed within a wall or also optionally be applied to the wall proper.

[0013] The cistern is adapted to be closed by a plate 3, which conveniently has at least one and preferably two touch-sensitive buttons 4 and 5.

[0014] The touch-sensitive buttons are adapted to activate a servomotor 6, which in turn, by means of a lever system 7, actuates a rod-like element 8, which is connected, at its lower end, to a ball-shaped element 9 that is a flow control element, which, when it abuts against a seat 10, blocks the discharge passage 11.

[0015] The touch-sensitive buttons are connected to an electronic device 12 that is powered by power supply means 13.

[0016] Conveniently, the rod-like element 8 is connected to an additional rod-like element 14, which is connected to the flow control element 9, and a tubular element 15 is fitted on the rod-like element 14 and defines the motion stroke of the flow control element 9.

[0017] Substantially, the servomotor 6, actuated by the buttons 4 and 5, acts on the lever system 7, which lifts or lowers the rod-like element 8 and consequently moves the flow control element 9 to open or close with respect to the discharge opening 11.

[0018] The amount of water discharged from the cistern following the actuation of the pushbuttons or touch-sensitive buttons 4 and 5 depends on the times set on the electronic device board 12, which in turn drives the servomotor 6.

[0019] The flow control element (ball) 9 remains raised by the servomotor 6 for example by approximately 30 mm. Closure of the discharge, again actuated by the servomotor, acts on the assembly constituted by the rod-like element 8, the rod-like element 14 and the flow control element 9.

[0020] The tubular element 15 is arranged on the rod-like element 14, which is connected to the flow control element 9 and allows the servomotor to actuate the opening and closing of the flow control element while performing a limited stroke.

[0021] The flow control element cannot float inside the cistern 2 but is retained in position and raised by the servomotor 6, which, once the set and selected time has elapsed, concludes the operation by pushing the flow control element 9 downwardly.

[0022] As an alternative to the power supply means 13, it is possible to provide a power supply of the system with a long-life rechargeable battery. This allows to install the touch-sensitive control also on manually actuated cisterns that are not provided with a sheath that can carry the electric power supply into the cistern. The rechargeable battery is hermetic and is arranged for example on the rear of the door and the power supply of the board (electronic device 12), by passing through the door, connects to the connector on the board. Battery recharging can occur with a battery charger by placing the battery charger against the transmitter plate. The receiver is arranged on the rear of the touch-sensitive plate.

[0023] The battery discharged warning can occur by means of blinking LEDs on the side of the use of the cistern.

[0024] In practice it has been found that the cistern according to the present invention achieves fully the intended aim and objects, since it can be actuated with touch-sensitive buttons by using a servomotor, which acts directly on the element for lowering the flow control element that allows/prevents the discharge of water from the cistern toward the sanitary fixture.

[0025] The cistern thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims. All the details may further be replaced with other technically equivalent elements.

[0026] In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to requirements and to the state of the art.

[0027] The disclosures in Italian Patent Application No. MI2014A001939 from which this application claims priority are incorporated herein by reference.

[0028] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A flushing cistern (1) for sanitary fixtures, comprising a cistern body (2) which accommodates internally a flow control element (9) adapted to allow the opening/closing of the water discharge passage, **characterized in that** it comprises at least one servomotor (6) adapted to lift/lower said flow control element (9), said flow control element (9) being actuated by at least one touch-sensitive button (4,5) arranged on a covering plate (3) of said cistern.

2. The cistern according to claim 1, **characterized in that** the servomotor (6) is connected by means of a lever system (7) to a rod-like element (8), which in turn is connected to an additional rod-like element (14) connected to said flow control element (9).

3. The cistern according to claim 2, **characterized in that** a tubular element (15) is fitted on said second additional rod-like element (14) in order to define the lifting/lowering stroke of said flow control element (9).

4. The cistern according to one or more of the preceding claims, **characterized in that** said servomotor (6) is controlled by an electronic board (12) connected to said covering plate (3).

5. The cistern according to one or more of the preceding claims, **characterized in that** said electronic board (12) and said servomotor (6) are powered by mains power supply means (13).

6. The cistern according to one or more of the preceding claims, **characterized in that** it comprises a rechargeable battery adapted to be arranged on the rear of said covering plate (3).

7. The cistern according to one or more of the preceding claims, **characterized in that** said rechargeable battery is adapted to be recharged with a battery charger that is intended to be rested on said covering plate (3).

8. The cistern according to one or more of the preceding claims, **characterized in that** said flow control element (9) is a ball.

9. The cistern according to one or more of the preceding claims, **characterized in that** said electronic board (12) is adapted to set the lifting time of said flow control element (9).

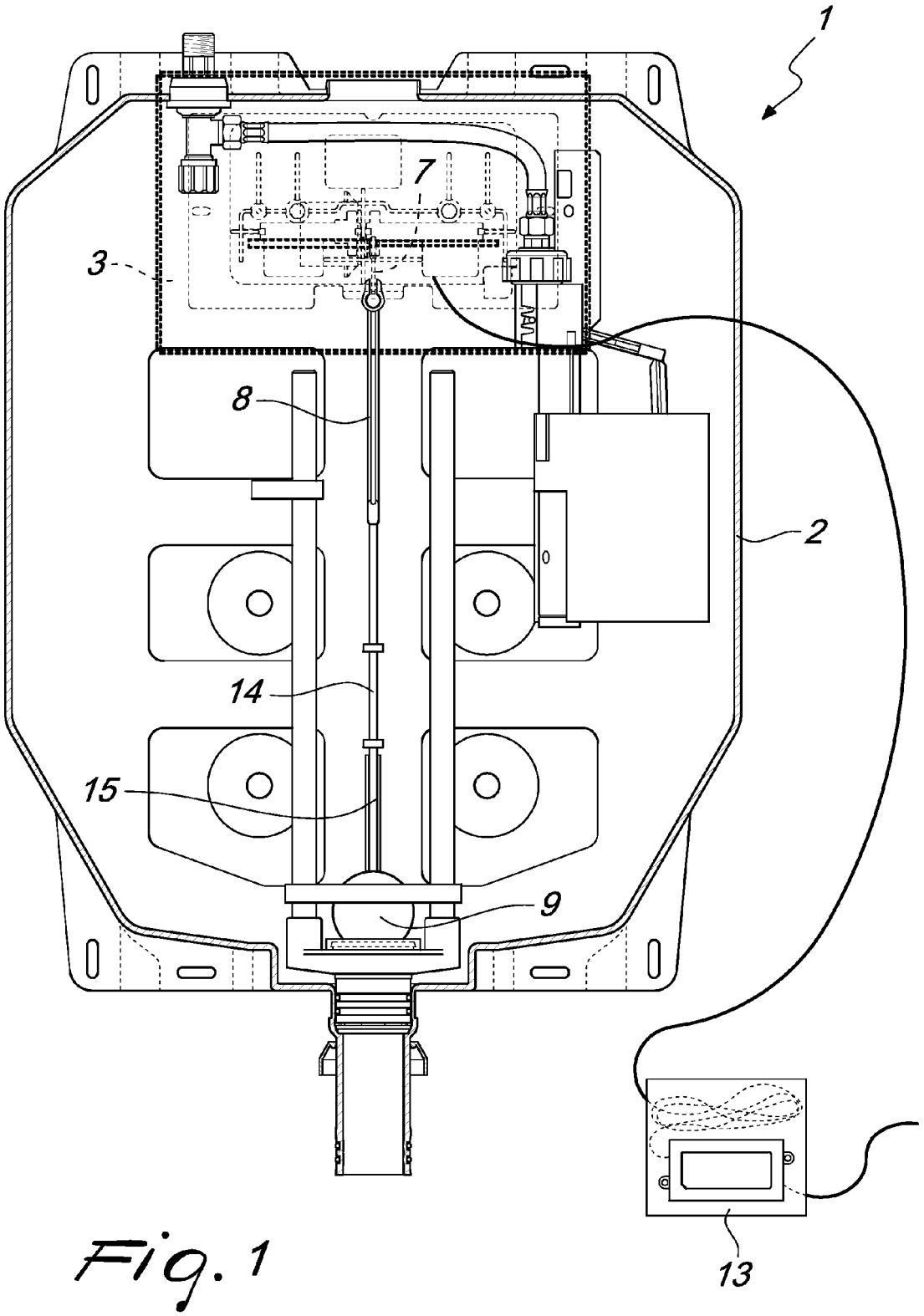

Fig. 1

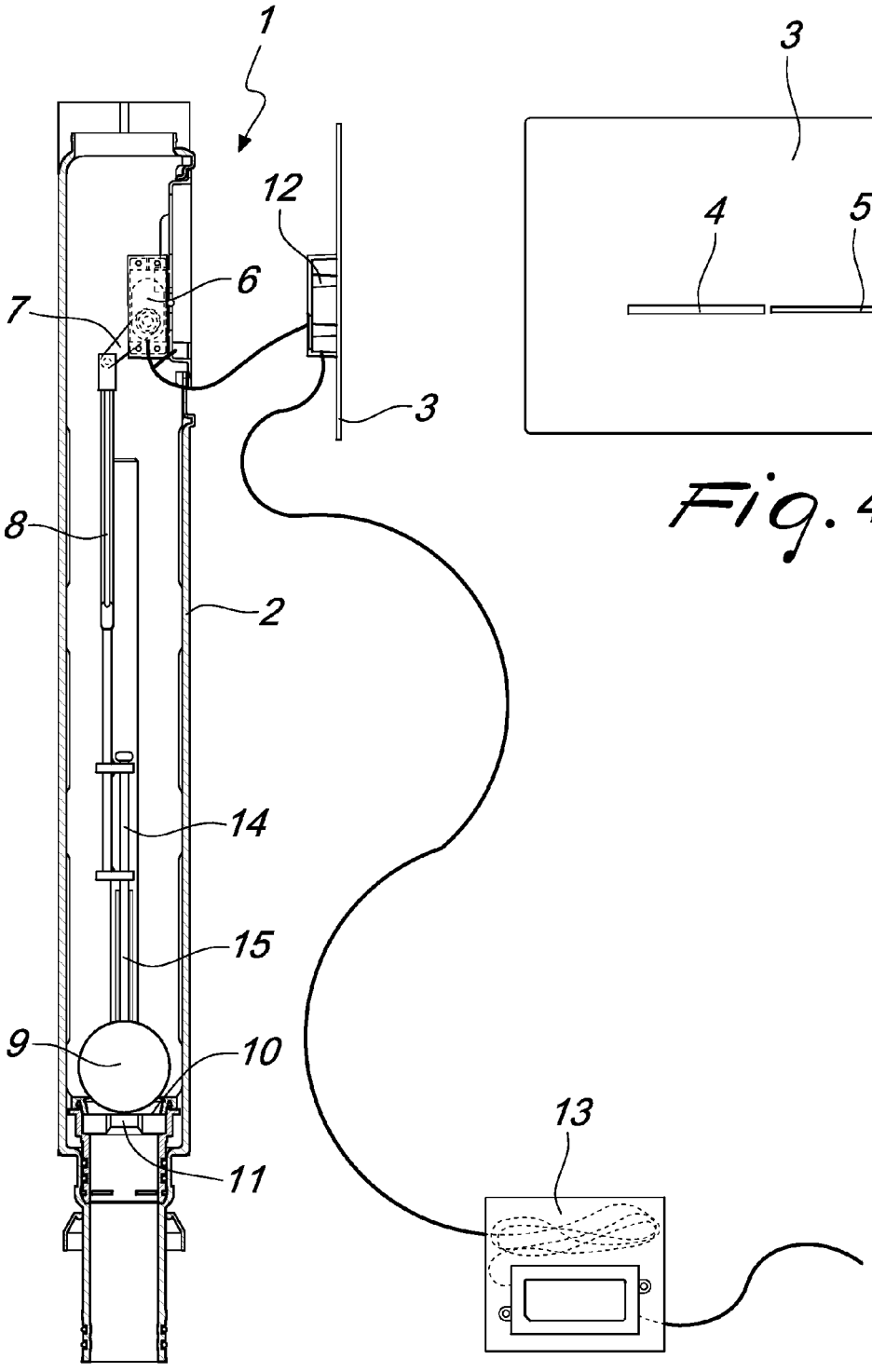

Fig. 2

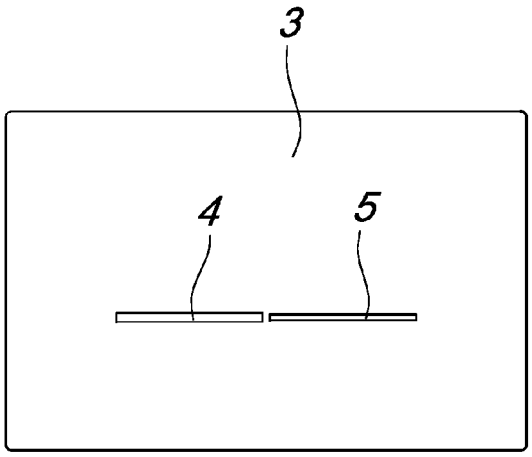

Fig. 4

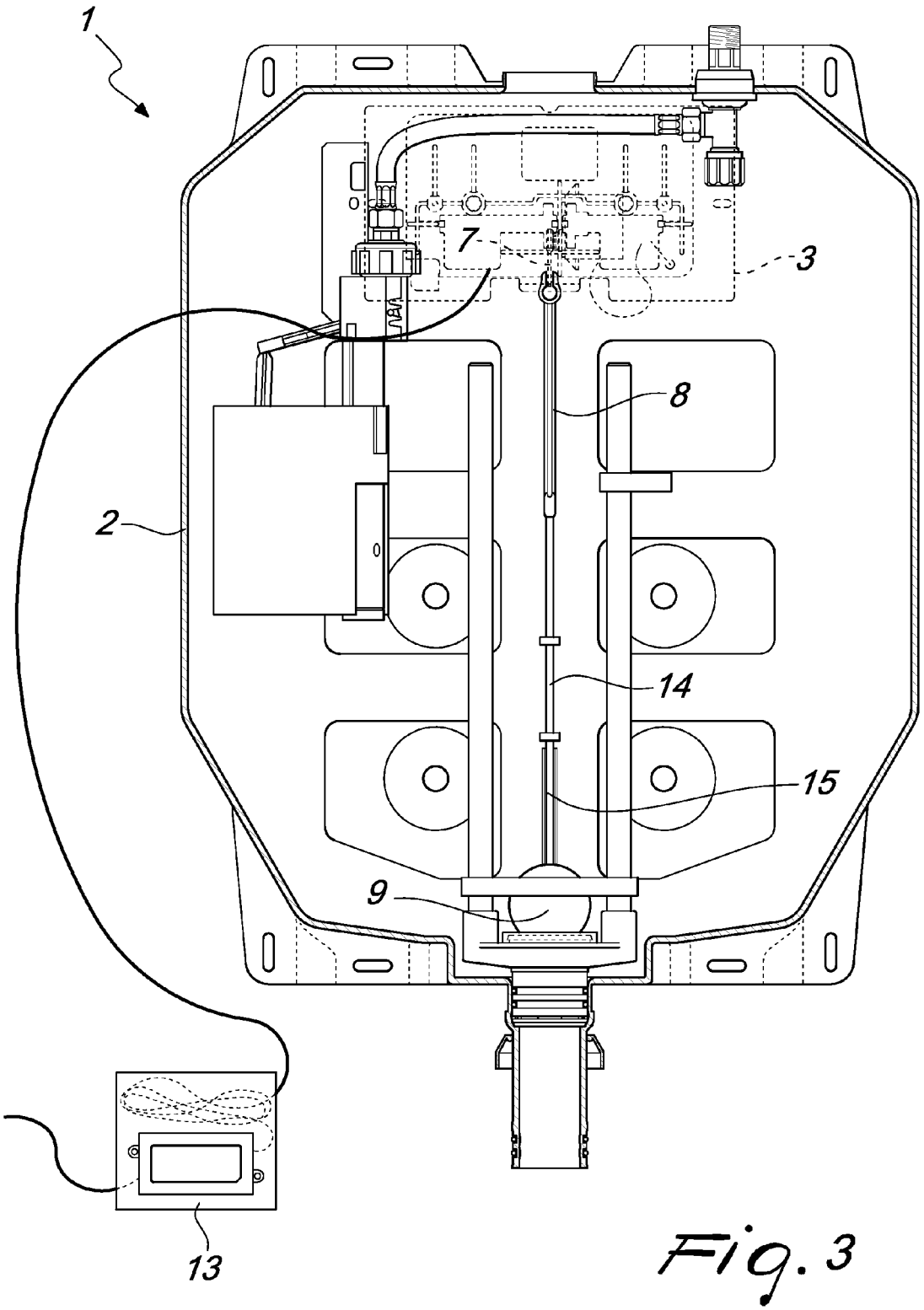

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 15 19 3936

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 Y	US 2006/041999 A1 (SANDERSON DILWORTH D [US]) 2 March 2006 (2006-03-02) * paragraph [0035] - paragraph [0047]; figures 1-10 *	1-7,9 8	INV. E03D5/10
X Y	US 2 813 274 A (LEWIS JOHN R ET AL) 19 November 1957 (1957-11-19) * the whole document *	1-9 8	
X	US 3 324 481 A (EMERSON ROBERT M ET AL) 13 June 1967 (1967-06-13) * the whole document *	1,4-8	
X	DE 103 30 331 A1 (GROHE WATER TECH AG & CO KG [DE]) 20 January 2005 (2005-01-20) * the whole document *	1,2,4,5,9	
			TECHNICAL FIELDS SEARCHED (IPC) E03D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	22 March 2016	Horst, Werner

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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O : non-written disclosure
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 15 19 3936

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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22-03-2016

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006041999 A1	02-03-2006	NONE	
US 2813274 A	19-11-1957	NONE	
US 3324481 A	13-06-1967	NONE	
DE 10330331 A1	20-01-2005	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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