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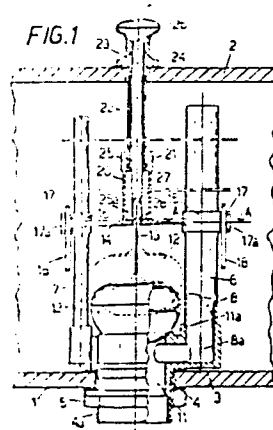
71 Applicant: **Campiglia, Giuseppe**
Via Olivella, Km. 1.500
Albano Laziale Roma(IT)

72 Inventor: **Campiglia, Giuseppe**
Via Olivella, Km. 1.500
Albano Laziale Roma(IT)

74 Representative: **Fiammenghi, Carlo et al,**
FIAMMENGHI DOMENIGHETTI Delfina Via Quattro
Fontane, 31
I-00184 Rome(IT)

54 **An adjustment device for the valve controlling the water flushing from a flushing tank for water closet.**

57 An adjustment device for the flushing valve (12) of a control valve unit a so called "Sifonic" type, controlling the flushing of the water from a flushing tank into the flushing pipe connected to a water closet bowl or like sanitary appliances, permitting a valve control unit to be mounted in flushing tanks of different sizes and designs.



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An adjustment device for the valve controlling the water
flushing from a flushing tank for water closet

- The present invention relates to an adjustment device for the valve unit of the so called "Sifonic" type, designed to control the water flushing from a flushing tank into a flushing pipe connected to a water closet bowl or like
5 sanitary appliances so as to permit said valve unit to be mounted in flushing tanks of different sizes and designs.
- 10 Up to the date the manufacturers have always constructed flushing tanks provided with flushing valve units which could be replaced only by other similar units, each adapted only for a predetermined type of flushing tank. As a result thereof for replacement purposes the plumbers
15 must have at their disposal different types of flushing valve units adapted for the various types of the different flushing tanks on the market.
- 20 The present invention aims to overcome said inconveniences providing an adjustment device to enable a flushing valve unit of the "Sifonic" type to be mounted in which-ever flushing tank.

For such a purpose this invention provides to connect, in an adjustable manner, the rod carrying the valve body provided to close the inlet orifice of the flushing pipe which is connected to the water closet bowl or like
5 sanitary appliance, to a control tubular bar so as to obtain a valve control member of an adjustable length, this connection being effective only in the raising direction of the valve rod, so that, on the contrary, this latter can freely slide along said tubular bar, as
10 this bar is returned in its lower end position. The tubular bar at its upper end is guided by a sleeve made integral with a cross bar or yoke member which is frictionally slidably mounted on and supported by two vertical posts, but which can be locked to these posts
15 by locking means, in releasable manner, at the desired height thereof, one of the two posts being constituted of a tube so as to be able to be used as overflow pipe which is put in communication with the flushing pipe downstream of the seat of the flushing valve, which is
20 of the well known type, made of an elastomeric material or rubber so as to be elastically deformable and which has a substantially spherical shape.

The means for locking yoke to its supporting posts are such that the locking operation does not require the use
25 of any tool.

The adjustment device of this invention is very simple in the construction as well as in the use and it is
30 such as to last long, even if during the use of this device it will remain at least partially always soaked inside the water with which the flushing tank is filled.

The device of this invention can be mounted in various types of flushing tanks by means of simple adjustment operations which can be performed by any skilled worker also not very skilled in the art.

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These and other characteristics and advantages of this invention will be better understood from the following description of this invention with reference to the accompanying drawing in which:

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Figure 1 is a diagrammatic partially sectioned front view of the device mounted inside a flushing tank; Figure 2 shows a detail of the cross section thereof, taken on the line A-A of Figure 1; Figure 3 shows the same detail before the assembly of the locking
15 slotted plate; and Figure 4 is the detail of the locking slotted plate shown in front view.

20 Now referring to the drawing, 1 generally indicates the bottom of a flushing tank only partially shown and provided with a removable cover 2. The device of this invention comprises a base body 3 extending downwards with a vertical tubular body 4 which will be connected
25 by conventional locking means with the flushing pipe (not shown). The tubular body 4 passes through a hole arranged in the bottom 1 and is externally threaded at 4a so as to receive the locking nut 5 provided to connect the conduit 4 to the bottom 1 with the interposition
30 of conventional packing rings.

The base body 3 extends upwards with two vertical cylindrical posts 6 and 7, the post 6 consisting of a

tubular member which has such a height as to act also
as overflow pipe. For such a purpose at its lower end
the inner cavity 8 of the tubular post 6 is put in
communication by a pipe union 8a with the inner conduit
5 11 of the tubular body 4 downstream of the inlet orifice
11a thereof which constitutes the seat of the valve 12.
The valve 12 is a valve of a well known type and is
constituted of a substantially spherical body made of
an elastomeric material or of rubber so as to be
10 elastically deformable and which is partially hollow at
least in its lower part and is open at its lower end
so that under the suction effect produced by the water
falling down into the flushing pipe an aspiration is
caused into the open inner cavity of the valve 12 which
15 causes the valve body 12 to be squashed against the
valve seat, i.e. the inlet orifice 11a of the conduit
11. At 14 is indicated a yoke member which can be moved
up and down and which is guided in this direction by
means of two outer open collars 15 and 16, which can
20 frictionally slide respectively along the cylindrical
posts 6 and 7.

Each of the collars 15 and 16 consists of a C-annular
member having end limb portions 17 extending outwards
and each provided with an outer side tooth 17a (Figures 2
25 and 3). The parallel end limbs 17 are spaced apart from
one another of a certain distance in their unstressed
conditions the width of which can be reduced by forcing
the limbs 17 one against the other and that is performed
by the use of a slotted plate 18 having a thickness not
30 higher than the distance between each tooth 17a and the
adjacent collar body 15 or 16. In each plate 18 a shaped

slot is provided extending longitudinally and which comprises a first section 19a having a width greater than the distance between the outer side surfaces of the teeth 17a of the limbs 17 of each collar 15 or 16, and a second section 19b having slightly convergent side walls and which has a width which becomes shorter than the distance between the outer side surfaces of the end limbs 17 in their unstressed conditions, but slightly greater than the sum of their thicknesses.

Therefore, by introducing the limbs 17, 17a through the wider portions 19a of the slots 19a, 19b of each slotted plate 18 for locking the yoke 14 the desired height it will be sufficient to push each plate 18 downwardly up to cause the limbs 17 to enter the respective narrower section 19a (Figure 4) so as to cause the limbs 17 to be forced one against the other so as to lock the collar 15 or 16 to the post 6 or 7 respectively in a releasable manner.

The yoke body 14 extends upwardly with two parallel arms fixedly connected at their upper ends to a vertical innerly threaded sleeve 21 to which a vertical tubular member 22 is screwed. At the upper end of the tubular member 22 is mounted a removable cap 23 provided with an axial hole.

Between the cap 23 and the upper end of the tubular member 22 will be inserted the tank cover 2 which for such a purpose is provided with a vertical hole 24 for the passage of the tubular member 22 and of the stem of the cap 23. In the inside of the tubular member 22 and of the cap 23 passes a tubular bar 25, on the upper end of which a gripping knob 26 is screwed, while at its lower

end the bar 25 has an outer threaded portion 25a by means of which it is screwed to a cap 28 provided with an axial threaded hole for the free passage of the valve rod 13 which has such a length that its upper end portion remains always in the inside of the tubular bar 25 whatever may be the position of the valve 12 or the depth of the flushing tank.

For the adjusting of the flushing valve unit by means of the adjustment device of the invention ^{the} slotted plates 16 are removed from the limbs 17 and the yoke 14 is moved up or down up to attain the height necessary for the correct valve operation according to the size of the flushing tank, in which the valve unit has to be mounted. Then the position of the rod 13 with respect to the bar 25 is adjusted in such a manner that the valve 12 can open in response of the raising of the knob 26 up to a predetermined height. For such a purpose about the rod 13 is mounted an elastic adjustable collar stop means 27 which will be positioned at such a height as to be placed always just above the cap 28, so that as the knob 26 is raised together with the tubular bar 25, the cap 28 through the stop means 27 causes the rod 13 together with the valve 12 to move upwards so that the valve 12 can open the inlet orifice 11a and water fall down into the flushing pipe; afterwards the valve 12 becomes free of floating on the water surface up to the instant in which the flushing tank becomes empty, so that, under the suction effect of the discharge of the water through the flushing pipe, the valve 12 is sucked against its seat 11a on account of the under pressure created in the inside of the lower cavity of the valve 12 which is of a partially

hollow type and has elastically deformable walls. The operation of said closure valve 12 will be not furtherly described, since it is well known and it does not concern the present invention. It has only to be pointed out

5 that each upward movement of the rod 13 is entirely free, since the connection between the tubular bar 25 and the rod 13 becomes effective only as a result of the raising of the bar 25 with regard to the rod 13, said connection taking place as the cap 28 abuts against the collar stop

10 means 27 or the like fixed to the rod 13 in an adjustable position.

Claims

1-An adjustment device for the unit controlling the
5 water flushing^{valve} from a flushing tank of a so called
"Sifonic" type, and comprising a base body (3) including
a vertical tubular member (4) provided with means for
seal connecting the tubular member (4) to the flushing
tank bottom (1) and to the flushing pipe connected to a
10 water closet bowl or like sanitary appliances the inlet
orifice (11a) of inner conduit (11) of the tubular
member (4) constituting the seat of the control flushing
valve (12) consisting of a substantially spherical
partially hollow body which is open at its open part,
15 characterized by the fact that the base body (3) extends
upwards with two vertical tubular posts (7 and 8) along which
can frictionally slide a yoke member (14) which can be
locked, at any desired height, to the posts (6 and 7) by
releasable locking means, the yoke member (14) extending
20 upwards with a guiding sleeve (20) in the inside of which
a tubular coaxial bar (25) is slidably received and which
is provided at its upper end with a gripping knob (26) and
at its lower end with a cap (25a) with an axial hole,
through which passes the upper end portion of the valve
25 rod (13) which above the cap (25a) is provided with an
adjustable stop means (27) which will be positioned at
such a height that the raising of the bar (25) causes
the raising of the rod (13) and the opening of the valve
(12) connected thereto in order to cause the beginning
30 of the discharge of the water from the flushing tank into
the flushing pipe.

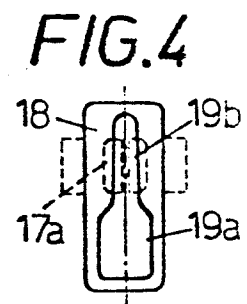
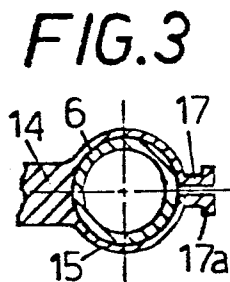
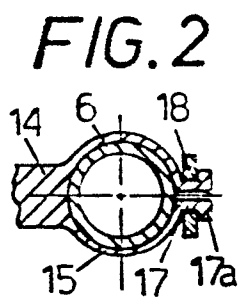
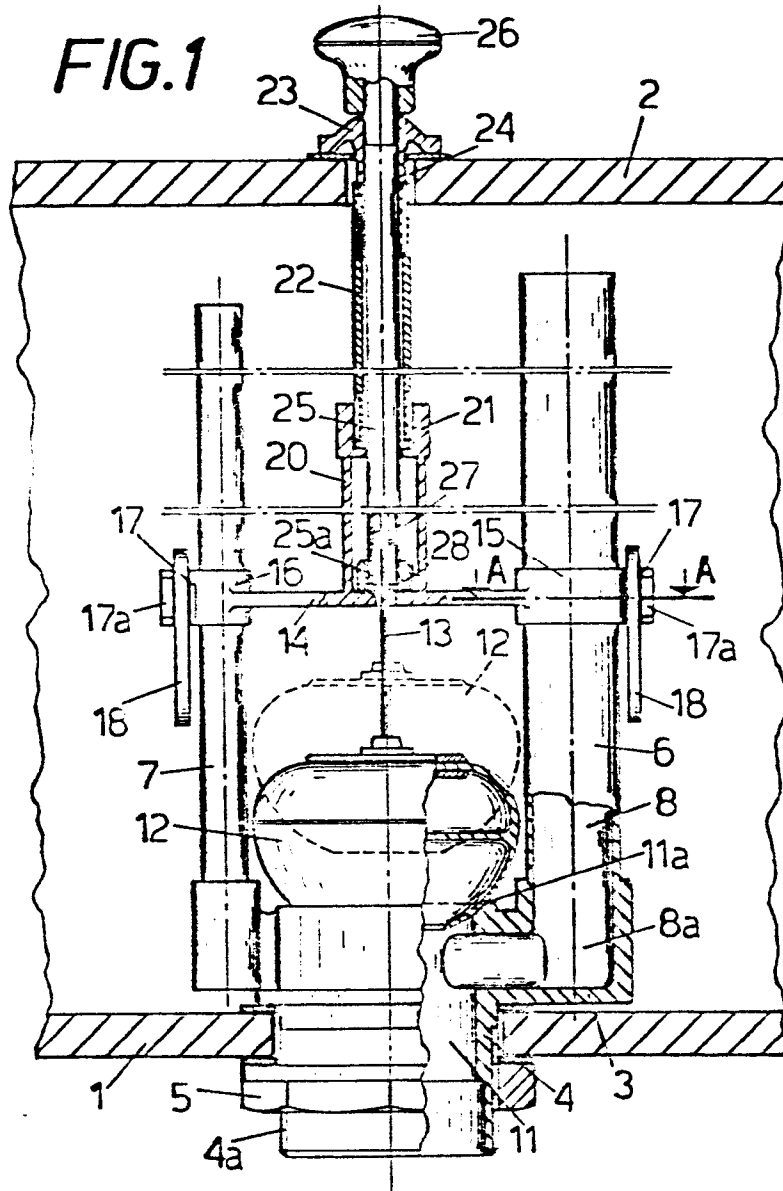
2-An adjustment device according to claim ¹ wherein the

yoke member (14) has outer end portions shaped as open collars (15 and 16) adapted to frictionally slide along the posts (7 and 8) respectively, the ends of the open collars (15 and 16) extending outwards with parallel limbs (17), each having an outer side tooth (17a), with each of the collars (15 and 16) cooperating a slotted rectangular plate (18), having a longitudinal shaped slot comprising a first section (19a) of a width greater than the distance between the outer ~~than the distance between~~ ~~the outer~~ surfaces of the two teeth of each collar (15 or 16) in the unstressed conditions of the limbs (17), and a second section (19b) having a decreasing width which attains a value substantially equal to the sum of the thicknesses of the pair of limbs (17) of each collar (15 or 16), each slotted plate (18) having a thickness not smaller than the distance between each tooth (17a) and the adjacent outer wall of the respective collar (15 or 16).

3-An adjustment device according to claim 1, wherein one of the posts (6 and 7), the post 6, for instance, is hollow and has such height to serve as overflow pipe, the lower end of this post (6) being put in communication with the inner discharging conduit 11 of the tubular extension downstream of the inlet orifice (11a) which acts as valve seat for the valve (12).



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EUROPEAN SEARCH REPORT

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Application number

EP 79 830 004.2

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. ²)
Category	Citation of document with indication, where appropriate, of passages	Relevant to claim	
	<u>US - A - 2 518 679</u> (GRAHAM) * fig. 1 to 9 * ---	1,2,3	E 03 D 1/34 F 16 K 21/04
	<u>US - A - 2 765 474</u> (DUNCAN) * fig. 1 to 4 * ---	1,2,3	
	<u>US - A - 2 781 520</u> (MICEK) * fig. 2, 4 * ---	1,2,3	TECHNICAL FIELDS SEARCHED (Int. Cl. ²)
	<u>US - A - 2 058 449</u> (HEATH) * fig. 1, 2 * ---	1,3	E 03 D 1/00 F 16 K 21/00
	<u>BE - A - 676 677</u> (MAHU & FILS) * fig. 1, 6 * ---	1,3	
	<u>BE - A - 642 749</u> (MOHR) * fig. 3, 4 * ---	1,3	
	<u>CH - A - 582 284</u> (ROBBIANI) * fig. 1, 2 * ---	1	CATEGORY OF CITED DOCUMENTS X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
A	<u>US - A - 3 590 396</u> (GRAZIOSI) * fig. 1 to 8 * ----		
<input checked="" type="checkbox"/> The present search report has been drawn up for all claims			&: member of the same patent family, corresponding document
Place of search Berlin		Date of completion of the search 11-07-1979	Examiner PAETZEL