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(54) DUAL-FLUSH PNEUMATIC PUSH BUTTON FOR TOILET TANK FLUSH SYSTEMS

(57) Dual flush pneumatic pushbutton for toilet discharge mechanisms.

This consists in the pushbutton strictly speaking consisting of a pump formed of a piston and sleeve which communicates with a corresponding bellows or piston in the discharge mechanism. The pushbutton is fitted with a single joint and has two parts, one larger and one smaller. The larger part is for a greater flush pulsation and the smaller one, for a partial flush pulsation, is activated by a rod constituting the limit for this. Internally it has a recovery spring in the chamber for the large pushbutton and a recovery spring for the smaller pushbutton.

For application in manufacturing pushbuttons for toilet flushing mechanisms.

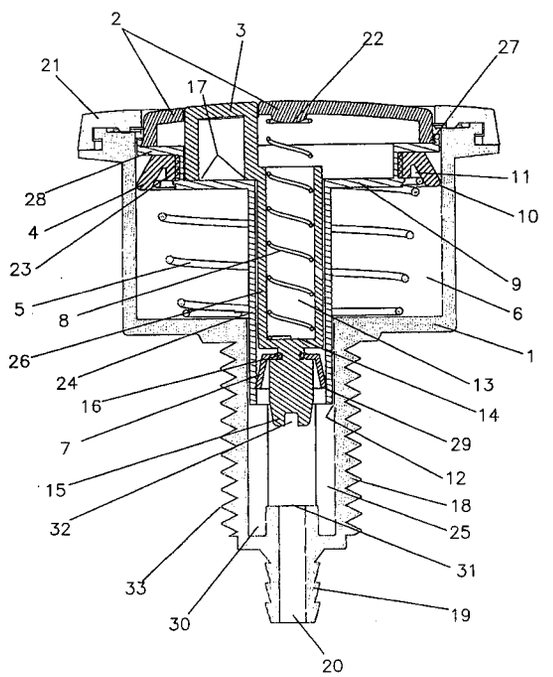

FIGURA 1

EP 1 498 553 A1

Description

[0001] The technical field involved in this invention is that of pushbuttons for discharging toilet cisterns.

[0002] The usual technique implemented for discharging cisterns consists of a pull, a pushbutton or a lever. This requires an often complex mechanical combination to align and make the mechanism operated compatible with the mechanism causing the discharge.

[0003] But this is not always a simple matter to achieve. Cisterns are often produced with cut or sloping shapes which prevent alignment between the pushbutton mechanism or the lever and the discharge system. There are also often special designs, even patterns made through particular commissions or limited production runs, which prove difficult to make compatible with pre-existing discharge mechanisms.

[0004] Statement of the prior state of the art.

[0005] There is a discharge system based on pneumatic activation for this function, disclosed in ES1012004 for an extendible connection pipe for sanitary fixtures and water discharges, which is characterised by having a pushbutton with a push nozzle and hood with bellows for adjusting the elevation height of the discharge pipe.

[0006] ES1010179 for a cistern discharge system with pneumatic pushbutton is formed of a valve which communicates a depression in a discharger of the sort that initiate the discharge when the upper chamber communicates with the atmosphere.

[0007] The object of this invention is a dual flush pneumatic pushbutton for toilet discharge mechanisms.

[0008] In order to make the following explanation clearer, three sheets of drawings are adjoined representing the essence of this invention in three figures.

[0009] Figure 1 shows a pushbutton at rest, as seen in a cross-section view.

[0010] Figure 2 shows a pushbutton partially pressed, as seen in a cross-section view.

[0011] Figure 3 shows a pushbutton fully pressed, as seen in a cross-section view.

[0012] In said Figures 1 represents the casing of the pushbutton; 2 pushbutton I, 3 pushbutton II, 4 the joint between pushbuttons and chamber, 5 the spring in the chamber, 6 the chamber, 7 the joint of the appendix, 8 the spring of the appendix, 9 the moving wall of the chamber, 10 the outer wall of the joint, 11 the annular cavity in the joint, 12 the air passage between the internal wall of the pushbutton casing, 13 the internal spring housing, 14 the internal spring support, 15 the appendix of pushbutton body II, 16 the coupling between joint and appendix, 17 the support of pushbutton II, 18 the thread of the lower appendix of the pushbutton casing, 19 the sleeve connection, 20 the air outlet, 21 the trim cover, 22 the positioning projection of the internal spring, 23 the internal wall of the joint 4, 24 the extension of the moving wall 9, 25 the extension of the chamber 6, 26 the extension of pushbutton II, 28 the upper flange of the moving wall 9, 29 the lip of the joint 7, 30 the annular slot able to house the extension 24, 31 the central projection of the chamber extension, 32 the recess in the end of the appendix 15, 33 the extension of the casing 1.

[0013] Explanation of one form of embodiment.

[0014] This invention has a chamber structure able to be operated by means of a dual pulsation generating different volumes of air expulsion through the outlet sleeve which is connected to the discharge mechanism. The user thus has the choice of using a discharge with little water consumption or a discharge with a large water consumption, depending on the requirements. This device can be adapted to practically all discharge systems, whether these are of the high, medium or low cistern types, and the pushbutton can even be located in unusual places at the user's choice.

[0015] The structure of the chamber is that of a cylinder which is joined continuously to another cylinder located in the centre of the first so that both are created with the same generating line, and with the external more extensive one forming the means of air impulsion and the internal one acting as the guide and air retention means.

[0016] The mechanism placed in the chamber 6 is formed of a moving wall 9 fitted with a joint 4 connected to the moving wall 23 and whose lip 10 forms the sealed closure. This moving wall is fitted with a cylindrical prolongation 24 which is inserted in the prolongation of the chamber 25 so that the latter 25 acts as a guide for the former 24.

[0017] The extension of the moving wall 24 houses the extension of the pushbutton II 26, on which this is able to move. The displacement between parts 26 and 24 is closed by a seal 7 which, whilst allowing this displacement, prevents the air from getting out. The chamber is fitted with a spring 5 which is suitably given a conical shape so as to allow it to be compressed down to the volume of a single one of its spirals. Said spring 5 is antagonistic to the pulsation and has the function of returning the moving wall 9 to its rest position.

[0018] The moving wall 9 can be operated by two pushbuttons: on one hand by means of pushbutton II, which has an appendix 15 constituting a stop or travel limitation, on which the moving wall is located in an intermediate portion of its possible travel along chamber 6. This intermediate position can be seen in Figure 2,. This arrangement means that at point 17 pushbutton II 3 presses the wall 9 of the chamber, joined with parts 27 and 28 to pushbutton I 2, with the bottom limit stemming from the support of the appendix 15 in the central projection 31, the air being allowed through by the recess 32. The extension of pushbutton II 24 consists of a cylindrical body able to house a spring 8 so that this spring presses on the pushbutton I on its internal side. Pushbutton I has an acute perimeter edge 27 which fits in with the upper flange 28 of the moving wall 9, both parties having a complementary shape. It is inserted by elastic force and is protected by trim 21. The appendix

15 of pushbutton II forms a stop for the travel of pushbutton II. On this pulsation the travel of moving wall 9 is limited by said appendix 15. The pushbutton I is the part that allows pressure on the moving wall 9 to reach the end of its travel inside the chamber 6. Pushbutton II, which is independent of pushbutton I, thus has greater travel, being free through pressing the wall 9 directly until it covers the whole travel through chamber 6 as shown in Figure 3. In this case the pushbutton II with its extension 26 and its appendix 15 are similarly pressed, thus meaning that the air inside the extension of the chamber is similarly ejected through the outlet 20.

[0019] The joint 7 has a connection to the appendix 15 set in the constriction in this so that the joint is inserted under pressure, being closed at its coupling 16 and whose lower end has a lip 29 in contact with the inner wall of the extension of pushbutton II 26.

[0020] The pressure exerted by pushbutton I can, as shown in Figure 3, go as far as emptying the whole chamber 6, since in this case pushbutton I 2 forces the moving wall 9 to move towards the base of the chamber 6, given the conical form of the spring 5 whose spirals are housed inside each other, and the end shape of the extension 33 which has inside it an annular slot 30 meant for housing the end of the extension of the moving wall 24 in this phase, which leads to maximum reduction of the chamber 6 in this position represented by Figure 3. Pressing pushbutton II, according to Figure 2, partially empties the chamber 6. This part may possibly be enlarged or reduced according to the dimension of the extension of pushbutton II, so that its appendix 15 determines the depth of the pulsation in respect of the depth of the chamber.

[0021] This object is for industrial application in manufacturing devices for discharging toilet cisterns.

Claims

1. Dual flush pneumatic pushbutton for toilet discharge mechanisms, which by means of pressure exerted on a means for receiving said pressure conveys this through a pipe to a bag set in the corresponding mechanism, **characterised in that** this consists of a pulsation casing which integrates the impulsion pump, which has a casing 1 strictly speaking, at least one pushbutton which exerts pressure on a moving wall, means for sealing the chamber formed between the moving wall and the casing, a connection 19 to an outlet sleeve able to link up with a tube.

2. Pushbutton, according to claim 1, **characterised in that** this has two pushbuttons, one pushbutton I (2) for a small flush and a pushbutton II (3) for a large flush.

3. Pushbutton, according to claims 1 and 2, characterised because pushbutton I (2) rests on the moving wall (9) and goes inside an upper flange (28) of said moving wall complementary in shape to the acute perimeter edge (27) of said pushbutton (I).

4. Pushbutton, according to claims 1 and 5, **characterised in that** the moving wall (9) houses the joint (4) in the space marked out by the upper flange (28),

5. Pushbutton, according to claims 1 and 4 and either of claims 2 or 3, **characterised in that** the joint (4) has an outer lip (10) in contact with the internal perimeter of the chamber (6) and an inner wall (23) joined to the corresponding part of the moving wall (9).

6. Pushbutton, according to claim 1 and any of claims 2 to 5, **characterised in that** the joint (4) has an annular recess able to house part or all of the spring (5) for recovering the wall (9).

7. Pushbutton, according to claim 1 and any of claims 2 to 6, **characterised in that** the moving wall (9) of the chamber has an extension (24) which is inserted into an extension (25) of the chamber which forms its guide.

8. Pushbutton, according to claims 1 and any of claims 2 to 7, **characterised in that** the extension (25) of the chamber has an annular slot (30) made in its end.

9. Pushbutton, according to claims 1, 7 to 8 and any of claims 2 to 6, **characterised in that** the extension (24) of the moving wall (9) of the chamber and the extension (25) of the chamber (6) have complementary lengths so that the extension (24) of the moving wall can be fully inserted into the extension (25) of the chamber and into the annular slot (30) at its end.

10. Pushbutton, according to claims 1, 2 and any of claims 3 to 9, **characterised in that** pushbutton II (3) is formed of a body that is coplanar at rest with the other pushbutton I (2) and fitted with internal supports (17) able to press on and move the moving wall (9).

11. Pushbutton, according to claims 1, 2, 10, and any of claims 3 to 9, **characterised in that** the pushbutton II (3) has an extension (26) that is fitted inserted inside the extension (24) of the moving wall (9).

12. Pushbutton, according to claims 1, 2, 10 to 11 and any of claims 3 to 9, **characterised in that** the pushbutton II (3) houses inside its extension (26) a spring (8) for returning the pushbutton I (2) which rests on a positioning projection (22) set on the in-

ternal side of said pushbutton I (2)

13. Pushbutton, according to claims 1, 2, 10 to 12 and any of claims 3 to 9, **characterised in that** the extension (26) of the pushbutton II (3) has an annular constriction and an appendix (15) at its end.

14. Pushbutton, according to claim 1 and any of claims 2 to 13, **characterised in that** the appendix (15) forms a stop for the travel of pushbutton II, by support in a central projection (30) set in the extension (25) of the chamber.

15. Pushbutton, according to claim 14, **characterised in that** the appendix (15) has at least one recess made in its end.

16. Pushbutton, according to claims 14 and 15, **characterised by** the fact that the recess made in the end of the appendix (15) forms a passage for air towards the exit (20).

17. Pushbutton, according to claims 1 and any of claims 2 to 16, chacacterised in that the extension (26) of pushbutton II (3) has in its annular constriction a joint (7) joined to this by said annular constriction (16).

18. Pushbutton, according to claim 1 and any of claims 2 to 17, **characterised in that** the joint (7) has an outer lip (29) in permanent contact with the internal wall of the extension of the chamber (25).

19. Pushbutton according to any of claims 1 to 18, **characterised in that** the casing (1) has in its extension (33) means for securing this.

20. Pushbutton, according to claim 19, **characterised in that** the means for fixing the extension (33) of the casing (1) is a thread.

Amended claims under Art.19.1 PCT

1. Dual flush pneumatic pushbutton for toilet discharge mechanisms, which by means of pressure exerted on a means for receiving said pressure c onveys this through a pipe to a bag set in the corresponding mechanism, and fitted with a connection to an outlet sleeve able to link up with a pipe, with sealing means between a pushbutton casing and a chamber, being able to work by means of one or two pushbuttons for small and large impulsion, respectively, **characterised in that** the pulsation casing (1) which integrates the impulsion pump has a moving wall able to be pressed on by a pushbutton I (2) for small impulsion and a pushbutton II (3) for large impulsion, in which the pushbutton I (2) rests on the moving wall (9) and goes into an upper flange (28) of said moving wall in a complementary shape to the acute perimeter edge (27) of said pushbutton (1) and in which the moving wall (9) houses the joint (4) in the space limited by the upper flange (28) and in which the joint (4) has an outer lip (10) for contact with the internal perimeter of the chamber (6) and an internal wall (23) which is joined to the corresponding part of the moving wall (9).

2. Pushbutton, according to claim 1, **characterised in that** the joint (4) has an annular recess able to house part or all of the spring (5) for recovery of the wall (9).

3. Pushbutton, according to claim 1, **characterised in that** the moving wall (9) of the chamber has an extension (24) which is inserted into an extension (25) of the chamber which constitutes its guide.

4. Pushbutton, according to claims 1 and either of claims 2 and 3, **characterised in that** the extension (25) of the chamber has an annular slot (30) made in its end.

5. Pushbutton, according to claims 1 and any of claims 2 to 4, **characterised in that** the extension (24) of the moving wall (9) of the chamber and the extension (25) of the chamber (6) have complementary lengths so that the extension (24) of the moving wall can be fully inserted into the extension (25) of the chamber and into the annular slot (30) at its end.

6. Pushbutton, according to claims 1 and any of claims 3 to 5, **characterised in that** pushbutton II (3) is formed of a body that is coplanar at rest with the other pushbutton I (2) and fitted with internal supports (17) able to press on and move the moving wall (9).

7. Pushbutton, according to claims 1, 6 and any of claims 2 to 5, **characterised in that** pushbutton II (3) has an extension (26) that is fitted inserted inside the extension (24) of the moving wall (9).

8. Pushbutton, according to claims 1, 6 and 7, and any of claims 2 to 5, **characterised in that** the pushbutton II (3) houses inside its extension (26) a spring (8) for returning the pushbutton I (2) which rests on a positioning projection (22) set on the internal side of said pushbutton I (2)

9. Pushbutton, according to claims 1, 6 and 8 and any of claims 2 to 5, **characterised in that** the extension (26) of the pushbutton II (3) has an annular constriction and an appendix (15) at its end.

10. Pushbutton, according to claim 1 and any of claims

2 to 9, **characterised in that** the appendix (15) forms a stop for the travel of pushbutton II, by support in a central projection (30) set in the extension (25) of the chamber.

11. Pushbutton, according to claim 10, **characterised in that** the appendix (15) has at least one recess made in its end.

12. Pushbutton, according to claims 10 and 11, **characterised by** the fact that the recess made in the end of the appendix (15) forms a passage for air towards the exit (20).

13. Pushbutton, according to claims 1 and any of claims 2 to 12, **characterised in that** the extension (26) of pushbutton II (3) has in its annular constriction a joint (7) joined to this by said annular constriction (16).

14. Pushbutton, according to claims 1 and any of claims 2 to 13, **characterised in that** the joint (7) has an outer lip (29) in permanent contact with the internal wall of the extension of the chamber (25).

15. Pushbutton, according to any of claims 1 to 14, **characterised in that** the casing (1) has in its extension (33) a securing means which consists of a thread.

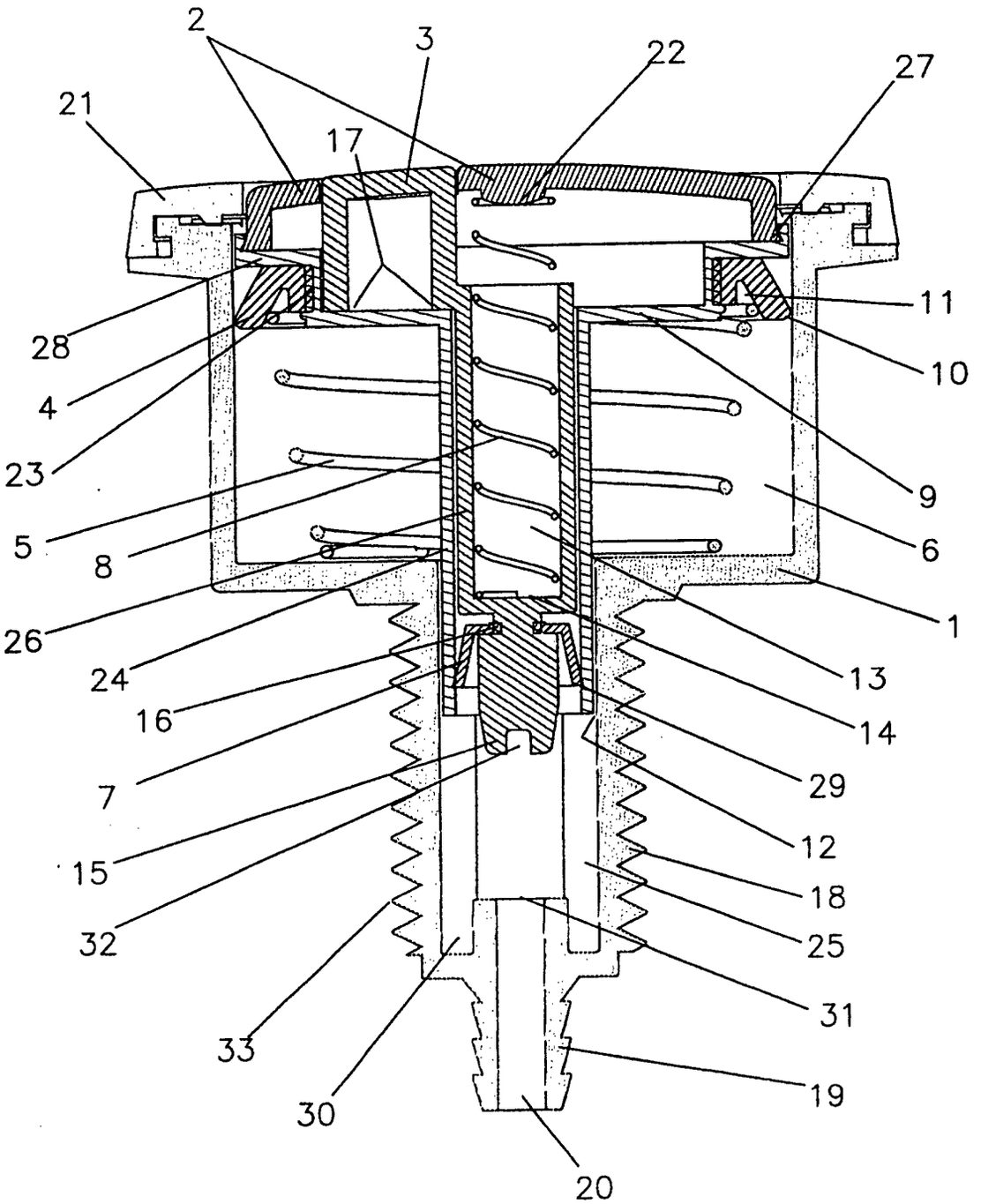
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FIGURA 1

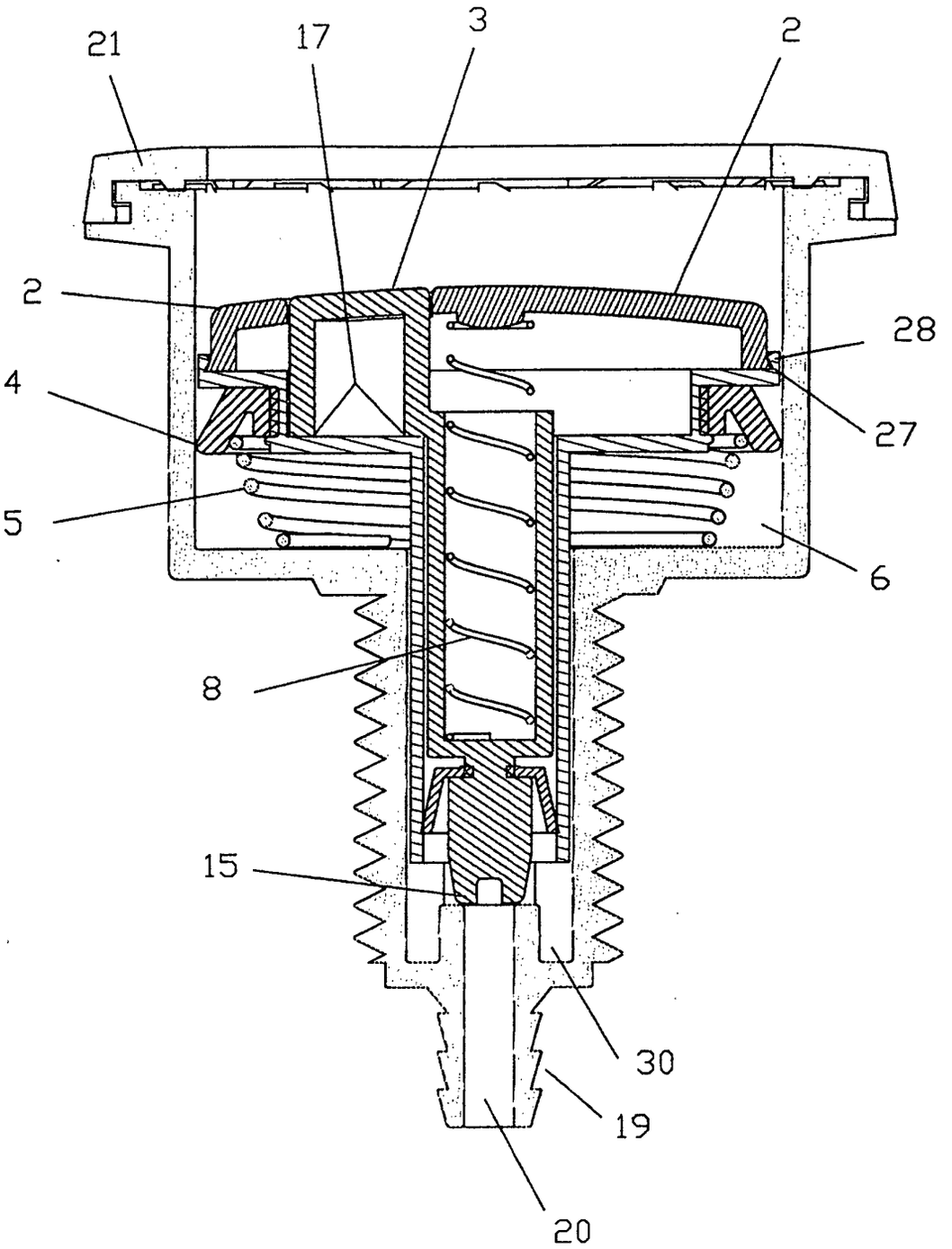

FIGURA 2

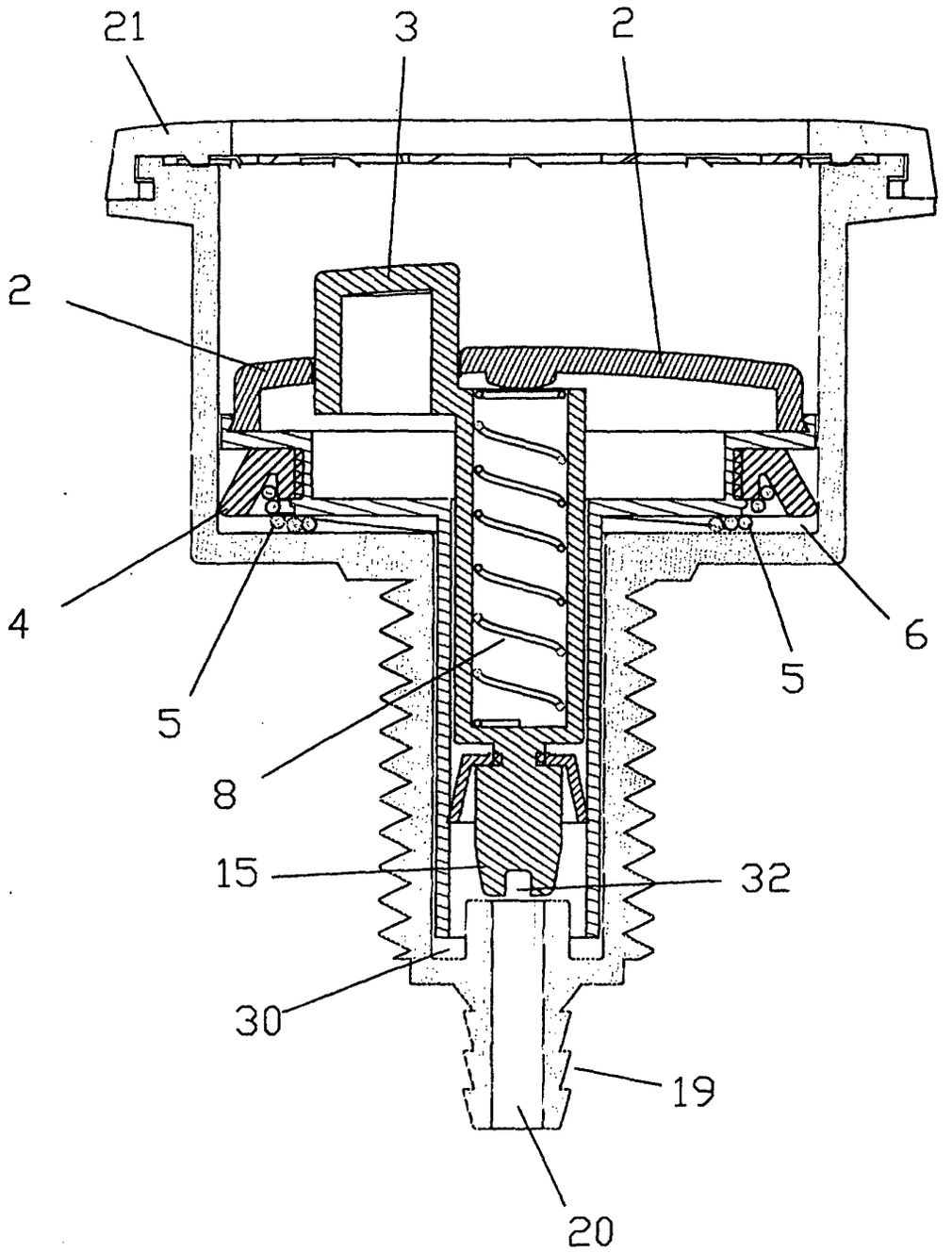

FIGURA 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES02/00029

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 E03D 3/12

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)

IPC 7 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)

CIBEPAT, EPODOC, WPI, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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

* Special categories of cited documents:

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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
26 March 2002 (26.03.02)	**16 April 2002 (16.04.02)**
Name and mailing address of the ISA/ **S.P.T.O.**	Authorized officer
Facsimile No.	Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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