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(54) **Pneumatic device for activating the discharge valve of a lavatory flush tank**

Pneumatische Auslösevorrichtung für ein Ablaufventil eines Spülkastens

Dispositif de commande pneumatique d'une soupape de vidange d'une chasse d'eau

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Description

[0001] The present invention relates to a pneumatic device for activating the discharge valve of a lavatory flush tank.

[0002] In the design of lavatory fixtures, increasing demand exists to locate the manually operated control governing the discharge valve of the flush tank in other than the usual positions and, in general, at some distance from the tank.

[0003] Yet a further demand, to reduce water consumption, is to be able to cut off the outflow at any time after the control is operated.

[0004] At present, pneumatic devices, such as that disclosed by DE-A-3,729,569, are known wherein two pneumatic actuators act in opposite directions on a movable actuating member connected integral with a movable member of the discharge valve. Such devices normally comprise a single pushbutton by which the two pneumatic actuators are operated alternately, to open and close the discharge valve, by means of an air distributor, which, in use, is switched to one or other of two operating positions by the movable member of the discharge valve.

[0005] Devices of the aforementioned type present several drawbacks. In particular, the distributor must of necessity be located in the waterfree part of the tank to prevent the water from entering the conduits connecting the distributor to the pushbutton and the two pneumatic actuators.

[0006] Moreover, switching of the air supply by the distributor cannot be effected until the movable member of the valve comes to the end of its travel, i.e. reaches one or other of its limit positions, which means a time interval exists in which the outflow of water cannot be cut off.

[0007] Finally, such devices are complicated to assemble, require frequent servicing, are difficult to adapt to existing tanks, and are relatively expensive to produce.

[0008] It is an object of the present invention to provide a straightforward, reliable pneumatic device designed to overcome the aforementioned drawbacks typically associated with known devices.

[0009] According to the present invention, there is provided a pneumatic device for activating a discharge valve of a lavatory flush tank, the device comprising a connecting member movable along a given path and connected integral with a movable member of said valve; and a first and second pneumatic actuator, which act on said connecting member to move the connecting member in opposite directions along said path; characterized by comprising separate first and second control means for selectively and independently controlling said pneumatic actuators regardless of the position of the connecting member along said path.

[0010] Preferably, the above device comprises an outer casing, and said connecting member comprises a

slide portion housed inside the casing, and guide means associated with the casing; said slide portion being connected to said guide means so as to slide along said path.

[0011] A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a partial side view of a lavatory flush tank discharge valve, and a section of a preferred non-limiting embodiment of a pneumatic device in accordance with the teachings of the present invention;

Figure 2 shows a larger-scale detail of the Figure 1 device;

Figure 3 shows a section along line III-III in Figure 1.

[0012] Number 5 in Figure 1 indicates a discharge valve for a lavatory flush tank (not shown). Valve 5 is fitted to the bottom wall (not shown) of the tank, and comprises a fixed body 6, and an overflow tube 7 fitted to fixed body 6 in sliding manner along an axis A coincident with the axis of tube 7 itself.

[0013] Tube 7 is moved both ways along axis A by a pneumatic device 8, which comprises a hollow elongated casing 9 presenting an axis B parallel to axis A, and two pneumatic actuators 11 and 12.

[0014] Each actuator 11, 12 comprises a deformable membrane 13, 14 made of elastomeric material, and which is bag-shaped when deformed - as shown by the dotted line for membrane 13 in Figure 1 - and forms a number of bends 15 when idle - as shown by the continuous lines in Figure 1.

[0015] Actuators 11 and 12 also comprise respective identical plugging members 16 and 17, each of which forms a respective end portion of casing 9, and positively engages an intermediate cylindrical portion 9a of casing 9 extending coaxially with axis B. Each member 16, 17 grips a peripheral end portion of respective membrane 13, 14 against a respective end portion of portion 9a, and presents a curved asymmetrical projection 18, a flat flange 19 and a cylindrical portion 21.

[0016] Portion 21 presents an outer annular groove 22 (Figure 2) for airtight connection of respective membrane 13, 14 to portion 9a, so that a respective variable-volume chamber 23, 24 is formed between each membrane 13, 14 and respective member 16, 17.

[0017] More specifically, member 16 is positioned so that flange 19 grips a circular edge 26 of membrane 13 against an end edge 27 of portion 9a, which edge 27 is bent inwards to define an inner projection of portion 9a, and is located at annular groove 22 of member 16 so that membrane 13 is also gripped in airtight manner between edge 27 and groove 22.

[0018] As shown in Figure 1, portion 9a comprises a cylindrical tubular body 29 coaxial with axis B, and terminates, at the end facing member 17, with a collar 30, which is connected integral with body 29 and presents

an edge 32 similar in shape to edge 26 and bent inwards to define a respective inner projection.

[0019] As shown in Figure 2, flange 19 of member 17 grips a circular edge 33 of membrane 14 against bent edge 32, which is located at annular groove 22 of member 17 so that membrane 14 is also gripped in airtight manner between edge 32 and groove 22.

[0020] Each member 16, 17 also presents an outwardly-facing air nozzle 34 located at side 36 of curved projection 18; and each nozzle 34 is connected to a respective known pneumatic pushbutton 38, 39 (shown schematically in Figure 1) by a respective flexible conduit 37. More specifically, pneumatic pushbuttons 38, 39 may be of any type, e.g. comprising a variable-volume air chamber defined, for example, by a bellows, and a known device for varying the volume of the air chamber.

[0021] Control device 8 also comprises a movable connecting member in turn comprising a slide 41 connected to portion 9a so as to slide along axis B. More specifically, slide 41 comprises a cylindrical wall 42 inside portion 9a, and a flat partition 43 connected integral with wall 42, extending inside wall 42, crosswise to axis B, between membranes 13 and 14, and which, in use, is moved both ways along axis B by membranes 13 and 14. Partition 43 presents three openings 44 to enable slide 41, in use, to move freely along axis B in the presence of any fluid inside casing 9.

[0022] Slide 41 also comprises a cylindrical sector-shaped outer wall 46 coaxial with wall 42 and connected to wall 42 by a guide block 47, which is partly housed inside an axial slot 48 formed in portion 9a, parallel to axis B, and extending just short of collar 30, so that slide 41 is connected to portion 9a in axially-sliding, angular-fixed manner.

[0023] A radial arm 49 extends from wall 46 and terminates with a fork 51, which snaps inside an annular groove 52 formed on the outer surface of overflow tube 7, and presents elastic arms (Figure 3) extending about an arc of over 180° and which snap inside groove 52 to connect slide 41 to the movable part of discharge valve 5 of the flush tank.

[0024] Casing 9 also comprises two bottom arms 53 fitted with a substantially conical open collar 54, which engages an outer annular seat 57 formed on fixed body 6 of valve 5, between a wall 56 and an end flange 58. More specifically, collar 54 presents an inside diameter equal to that of seat 57, extends about an arc of over 180°, and presents radial slots 59 enabling it to expand elastically to snap inside seat 57.

[0025] To fit device 8 to discharge valve 5, flexible conduits 37 of the required length are connected to respective nozzles 34; collar 54 is snapped inside seat 57 on wall 56 to connect casing 9 to fixed body 6 of discharge valve 5; fork 51 of slide 41 is snapped inside groove 52 on tube 7; and flexible conduits 37 are connected to respective pushbuttons 38, 39, which may be located to suit the user.

[0026] Operation of device 8 will now be described as

of the condition shown in Figure 1, wherein slide 41 is located adjacent to member 16 so that valve 5 is closed.

[0027] When pneumatic pushbutton 38 is operated as of the above condition, air is supplied along respective conduit 37 into variable-volume chamber 23 to distend membrane 13 as shown by the dotted line in Figure 1. As it distends, membrane 13 cooperates directly with partition 43 to move slide 41 gradually upwards into the position shown by the dotted line; and, as it moves upwards, slide 41, via fork 51, draws overflow tube 7 upwards along axis A so that water flows out of the flush tank into the lavatory (not shown).

[0028] At any time after releasing pushbutton 38, and regardless of the position of slide 41 along axis B, pneumatic pushbutton 39 may be operated to feed air along respective conduit 37 into variable-volume chamber 24 and so distend membrane 14. Membrane 14 thus engages partition 43 from the top to move slide 41 gradually towards member 16; and fork 51 moves tube 7 back downwards to gradually close valve 5 and so cut off the outflow of water.

[0029] Holes 44 in partition 43 of slide 41 obviously permit the fluid inside casing 9 to pass freely from one side to the other of partition 43 to prevent any impediment or delay in the movement of slide 41.

[0030] The advantages of pneumatic device 8 as compared with known devices will be clear from the foregoing description.

[0031] In particular, device 8 operates both in the waterfree portion of the tank, i.e. in air, as well as in the portion of the tank normally filled with water, i.e. immersed in water. In the latter case, each time the tank is emptied completely, at least part of the water in casing 9 flows out through slot 48, and flows back in when further water is fed into the tank.

[0032] Moreover, pushbuttons 38 and 39 may be located to suit the user, even some distance from the tank and not necessarily close to each other.

[0033] Pushbuttons 38, 39 and the particular arrangement of actuators 11, 12 in relation to slide 41 enable valve 5 to be opened or closed immediately in any intermediate operating condition, i.e. regardless of the position of slide 41 along axis B, thus greatly reducing water consumption.

[0034] Finally, device 8 may be fitted not only to tanks designed for the purpose but also to existing tanks by simply connecting casing 9 to the fixed body of the discharge valve and fork 51 to the overflow tube.

[0035] Clearly, changes may be made to device 8 as described and illustrated herein without, however, departing from the scope of the present invention.

[0036] For example, casing 9 may be formed differently from that described; and groove 52 may be formed further up tube 7, e.g. close to the top end of tube 7, so that device 8 operates in the waterfree portion of the tank.

[0037] Moreover, casing 9 may be fitted to any fixed part of the tank, as opposed to valve 5; and membranes

13, 14 may be formed differently from those described by way of example, and may be fitted to casing 9 other than as shown.

Claims

1. A pneumatic device (8) for activating a discharge valve (5) of a lavatory flush tank, the device (8) comprising a connecting member (41, 51) movable along a given path (B) and connected integral with a movable member (7) of said valve (5); and a first (11) and second (12) pneumatic actuator, which act on said connecting member (41, 51) to move the connecting member (41, 51) in opposite directions along said path (B); characterized by comprising separate first (38) and second (39) control means for selectively and independently controlling said pneumatic actuators (11) (12) regardless of the position of the connecting member (41, 51) along said path (B).
2. A device as claimed in Claim 1, characterized by comprising an outer casing (9); and in that said connecting member (41, 51) comprises a slide portion (41) housed inside the casing (9), and guide means (48) associated with the casing (9); said slide portion (41) being connected to said guide means (48) so as to slide along said path (B).
3. A device as claimed in Claim 2, characterized in that said pneumatic actuators (11) (12) comprise respective variable-volume chambers (23) (24), each communicating with one of said first and second control means (38) (39); each variable-volume chamber (23) (24) being defined by a respective end portion (16) (17) of said casing (9) and by a respective elastically deformable membrane (13) (14).
4. A device as claimed in Claim 3, characterized in that said membranes (13) (14) cooperate directly in contact with said connecting member (41, 51).
5. A device as claimed in Claim 3 or 4, characterized in that each of said membranes (13) (14) is folded to form a number of bends.
6. A device as claimed in one of the foregoing Claims from 3 to 5, characterized in that said casing (9) comprises a cylindrical intermediate portion (9a); and in that each said membrane (13) (14) presents a respective peripheral portion gripped between said intermediate portion (9a) and a respective said end portion (16) (17).
7. A device as claimed in Claim 6, characterized in that each of said end portions (16) (17) of said casing (9) comprises a cylindrical portion (21) presenting an outer annular groove (22); each membrane (13) (14) being forced into a respective said outer annular groove (22) by a respective inner annular projection (27) (32) on said intermediate portion (9a).
8. A device as claimed in Claim 6 or 7, characterized in that each of said end portions (16) (17) of said casing (9) presents an outer annular flange (19); and each of said membranes (13) (14) presents a peripheral portion (26) (33) gripped between a respective said flange (19) and a shoulder (27) (32) on said intermediate portion (9a).
9. A device as claimed in Claim 7, characterized in that said intermediate portion comprises two tubular bodies (30) (29) connected integral with each other; each of said inner annular projections (27) (32) being carried on a respective said tubular body (30) (29).
10. A device as claimed in one of the foregoing Claims from 2 to 9, characterized in that said slide portion (41) comprises a cylindrical wall (42) connected to said guide means (48); and a transverse partition (43) integral with said cylindrical wall (42) and extending crosswise to said path (B).
11. A device as claimed in Claim 9 or 10, characterized in that said guide means comprise a slot (48) formed in said outer casing (9) and parallel to said path (B); said slide portion (41) comprising a sliding portion (47) engaging said slot (48) in sliding manner.
12. A device as claimed in Claim 11, characterized in that said connecting member (41, 51) comprises connecting means (51) which snap on to said movable member (7) of the discharge valve (5).
13. A device as claimed in Claim 12, characterized in that said connecting means comprise a fork (51) connected integral with said sliding portion (47) and which snaps inside an annular groove (52) formed on said movable member (7) of the discharge valve (5).
14. A device as claimed in one of the foregoing Claims from 2 to 13, characterized by comprising further connecting means (54) for releasably connecting said casing (9) to a fixed supporting body (6).
15. A device as claimed in Claim 14, characterized in that said further connecting means (54) are snap-on connecting means.
16. A device as claimed in Claim 15, characterized in that said snap-on connecting means (54) comprise

an elastic fork, which positively engages a seat (57) formed on a fixed body (6) of said discharge valve (5).

Patentansprüche

1. Pneumatische Vorrichtung (8) zum Auslösen bzw. Betätigen eines Ablauf- bzw. Ablaufventils (5) eines Toiletten-Spülkastens, wobei die Vorrichtung (8) ein Verbindungselement (41, 51) umfaßt, das entlang eines vorgegebenen Wegs (B) bewegbar ist und einstückig bzw. integral mit einem bewegbaren Element (7) des Ventils (5) verbunden ist; und eine erste (11) und zweite (12) pneumatische Betätigungsvorrichtung, welche auf das Verbindungselement (41, 51) wirkt, um das Verbindungselement (41, 51) in entgegengesetzte Richtungen entlang des Wegs (B) zu bewegen; gekennzeichnet dadurch, daß sie getrennte erste (38) und zweite (39) Regel- bzw. Steuereinrichtungen zum selektiven und unabhängigen Regeln bzw. Steuern der pneumatischen Betätigungsvorrichtungen (11), (12) unabhängig von der Position des Verbindungselements (41, 51) entlang des Wegs (B) umfaßt.
2. Vorrichtung nach Anspruch 1, gekennzeichnet dadurch, daß sie ein äußeres Gehäuse (9) umfaßt; und daß das Verbindungselement (41, 51) einen Gleit- bzw. Schieberbereich (41) umfaßt, der innerhalb des Gehäuses (9) angeordnet ist, und Führungseinrichtungen (48), die mit dem Gehäuse (9) verbunden sind; wobei der Schieberbereich (41) mit den Führungseinrichtungen (48) verbunden ist, um entlang des Wegs (B) zu gleiten.
3. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, daß die pneumatische Betätigungsvorrichtungen (11) (12) entsprechende raum- bzw. volumvariable Kammern bzw. Kammern mit variablem Volumen (23) (24) umfassen, welche jeweils mit einem der ersten und zweiten Steuer- bzw. Regeleinrichtungen (38) (39) wechselwirken; wobei jede volumvariable Kammer (23) (24) durch einen entsprechenden Endbereich (16) (17) des Gehäuses (9) und durch eine entsprechende, elastisch deformierbare Membran (13) (14) definiert ist.
4. Vorrichtung nach Anspruch 3, dadurch gekennzeichnet, daß die Membranen (13) (14) direkt in Kontakt mit dem Verbindungselement (41, 51) wechselwirken.
5. Vorrichtung nach Anspruch 3 oder 4, dadurch gekennzeichnet, daß jede der Membranen (13) (14) gefaltet ist, um eine Anzahl von Krümmungen bzw. Biegungen auszubilden.

6. Vorrichtung nach einem der vorhergehenden Ansprüche 3 bis 5, dadurch gekennzeichnet, daß das Gehäuse (9) einen zylindrischen Zwischenbereich (9a) umfaßt; und daß jede der Membranen (13) (14) einen entsprechenden, zwischen dem Zwischenbereich (9a) und einem entsprechenden Endbereich (16) (17) eingeklemmten bzw. gegriffenen Umfangsbereich aufweist.
7. Vorrichtung nach Anspruch 6, dadurch gekennzeichnet, daß jeder der Endbereiche (16) (17) des Gehäuses (9) einen zylindrischen Bereich (21) umfaßt, der eine äußere, ringförmige Nut (22) aufweist; wobei jede Membran (13) (14) in eine entsprechende der äußeren, ringförmigen Nuten (22) durch einen entsprechenden, inneren, ringförmigen Vorsprung (27) (32) auf bzw. an dem Zwischenbereich (9a) eingepaßt bzw. gezwungen ist.
8. Vorrichtung nach Anspruch 6 oder 7, dadurch gekennzeichnet, daß jeder der Endbereiche (16) (17) des Gehäuses (9) einen äußeren, ringförmigen Flansch (19) aufweist; und jede der Membranen (13) (14) einen Umfangsbereich (26) (33) aufweist, der zwischen einen entsprechenden Flansch (19) und einer Schulter (27) (32) auf bzw. an dem Zwischenbereich (9a) eingeklemmt bzw. gegriffen ist.
9. Vorrichtung nach Anspruch 7, dadurch gekennzeichnet, daß der Zwischenbereich zwei ringförmige Körper (30) (29) umfaßt, die einstückig bzw. integral miteinander verbunden sind; wobei jeder der inneren, ringförmigen Vorsprünge (27) (32) auf bzw. an einem entsprechenden ringförmigen Körper (30) (29) getragen ist.
10. Vorrichtung nach einem der vorhergehenden Ansprüche 2 bis 9, dadurch gekennzeichnet, daß der Schieberbereich (41) eine zylindrische Wand (42) umfaßt, die mit den Führungseinrichtungen (48) verbunden ist; und eine querverlaufende Abtrennung bzw. Trennwand (43), welche einstückig bzw. integral mit der zylindrischen Wand (42) ist und sich in kreuzweiser Richtung zu dem Weg (B) erstreckt.
11. Vorrichtung nach Anspruch 9 oder 10, dadurch gekennzeichnet, daß die Führungseinrichtungen einen Schlitz (48) umfassen, der in dem äußeren Gehäuse (9) ausgebildet ist und parallel zu dem Weg (B) ist; wobei der Schieberbereich (41) einen gleitenden Bereich (47) umfaßt, der in den Schlitz (48) in gleitender Weise eingreift.
12. Vorrichtung nach Anspruch 11, dadurch gekennzeichnet, daß das Verbindungselement (41, 51) Verbindungseinrichtungen (51) umfaßt, welche auf bzw. an dem bewegbaren Element (7) des Ablaufventils (5) einschnappen.

13. Vorrichtung nach Anspruch 12, dadurch gekennzeichnet, daß die Verbindungseinrichtungen eine Gabel (51) umfassen, die einstückig bzw. integral mit dem Schieberbereich (47) verbunden ist und welche in eine ringförmige Nut (52), die auf bzw. an dem bewegbaren Element (7) des Ablaufventils (5) ausgebildet ist, einschnappt.

14. Vorrichtung nach einem der vorhergehenden Ansprüche 2 bis 13, dadurch gekennzeichnet, daß sie weitere Verbindungseinrichtungen (54) zum lösbaren Verbinden des Gehäuses (9) mit einem festgelegten Supportkörper (6) umfaßt.

15. Vorrichtung nach Anspruch 14, dadurch gekennzeichnet, daß die weiteren Verbindungseinrichtungen (54) Einschnapp-Verbindungseinrichtungen sind.

16. Vorrichtung nach Anspruch 15, dadurch gekennzeichnet, daß die Einschnapp-Verbindungseinrichtungen (54) eine elastische Gabel umfassen, welche positiv in einen Sitz (57), der an einem feststehenden Körper (6) des Ablaufventils (5) ausgebildet ist, eingreift.

Revendications

1. Dispositif pneumatique (8) pour actionner une soupape de vidange (5) d'un réservoir de chasse d'eau, le dispositif (8) comprenant un élément de liaison (41, 51) mobile le long d'un trajet donné (B) et relié solidairement à un élément mobile (7) de ladite soupape (5) ; et des premier (11) et second (12) actionneurs pneumatiques, qui agissent sur ledit élément de liaison (41, 51) pour déplacer l'élément de liaison (41, 51) dans des sens opposés le long dudit trajet (B) ; caractérisé en ce qu'il comprend des premier (38) et second (39) moyens de commande séparés pour commander sélectivement et indépendamment lesdits actionneurs pneumatiques (11) (12) quelle que soit la position de l'élément de liaison (41, 51) le long dudit trajet (B).

2. Dispositif selon la revendication 1, caractérisé en ce qu'il comprend un boîtier extérieur (9) ; et en ce que ledit élément de liaison (41, 51) comprend une portion formant pièce coulissante (41) logée à l'intérieur du boîtier (9), et des moyens de guidage (48) associés au boîtier (9) ; ladite portion formant pièce coulissante (41) étant reliée auxdits moyens de guidage (48) de façon à coulisser le long dudit trajet (B) .

3. Dispositif selon la revendication 2, caractérisé en ce que lesdits actionneurs pneumatiques (11) (12) comprennent des chambres à volume variable cor-

respondantes (23) (24), chacune d'elle communiquant avec un desdits premier et second moyens de commande (38) (39) ; chacune des chambres à volume variable (23) (24) étant définie par une portion d'extrémité correspondante (16) (17) dudit boîtier (9) et par une membrane déformable élastiquement correspondante (13) (14).

4. Dispositif selon la revendication 3, caractérisé en ce que lesdites membranes (13) (14) coopèrent directement en contact avec ledit élément de liaison (41, 51).

5. Dispositif selon la revendication 3 ou 4, caractérisé en ce que chacune desdites membranes (13) (14) est pliée pour former un certain nombre de plis.

6. Dispositif selon l'une des revendications précédentes 3 à 5, caractérisé en ce que ledit boîtier (9) comprend une portion intermédiaire cylindrique (9a), et en ce que chaque dite membrane (13) (14) présente une portion périphérique correspondante saisie entre ladite portion intermédiaire (9a) et une desdites portions d'extrémité (16) (17) correspondante.

7. Dispositif selon la revendication 6, caractérisé en ce que chacune desdites portions d'extrémité (16) (17) dudit boîtier (9) comprend une portion cylindrique (21) présentant une gorge annulaire extérieure (22) ; chaque membrane (13) (14) étant forcée dans une desdites gorges annulaires extérieures (22) correspondante par une saillie annulaire intérieure correspondante (27) (32) sur ladite portion intermédiaire (9a).

8. Dispositif selon la revendication 6 ou 7, caractérisé en ce que chacune desdites portions d'extrémité (16) (17) dudit boîtier (9) présente un rebord annulaire extérieur (19) ; et chacune desdites membranes (13) (14) présente une portion périphérique (26) (33) saisie entre un desdits rebords (19) correspondant et un épaulement (27) (32) sur ladite portion intermédiaire (9a) .

9. Dispositif selon la revendication 7, caractérisé en ce que ladite portion intermédiaire comprend deux corps tubulaires (30) (29) reliés solidairement l'un à l'autre, chacune desdites saillies annulaires intérieures (27) (32) étant supportée par un desdits corps tubulaires (30) (29) correspondant.

10. Dispositif selon l'une des revendications précédentes 2 à 9, caractérisé en ce que ladite portion formant pièce coulissante (41) comprend une paroi cylindrique (42) reliée auxdits moyens de guidage (48) ; et une cloison transversale (43) formée d'une pièce avec ladite paroi cylindrique (42) et s'étendant transversalement audit trajet (B).

11. Dispositif selon la revendication 9 ou 10, caractérisé en ce que lesdits moyens de guidage comprennent une fente (48) ménagée dans ledit boîtier extérieur (9) parallèlement audit trajet (B) ; ladite portion formant pièce coulissante (41) comprenant une portion coulissante (47) s'engageant avec ladite fente (48) de façon coulissante. 5
12. Dispositif selon la revendication 11, caractérisé en ce que l'élément de liaison (41) (51) comprend des moyens de liaison (51) qui s'encliquettent sur ledit élément mobile (7) de la soupape de vidange (5). 10
13. Dispositif selon la revendication 12, caractérisé en ce que lesdits moyens de liaison comprennent une pièce fourchue (51) qui est reliée en venue de matière avec ladite portion coulissante (47) et qui s'encliquette dans une gorge annulaire (52) ménagée dans ledit élément mobile (7) de la soupape de vidange (5). 15 20
14. Dispositif selon l'une des revendications précédentes 2 à 13, caractérisé en ce qu'il comprend d'autres moyens de liaison (54) pour relier de façon amovible ledit boîtier (9) à un corps de support fixe (6). 25
15. Dispositif selon la revendication 14, caractérisé en ce que lesdits autres moyens de liaison (54) sont des moyens de liaison par encliquetage. 30
16. Dispositif selon la revendication 15, caractérisé en ce que lesdits moyens de liaison par encliquetage (54) comprennent une pièce fourchue élastique, qui s'engage directement dans une embase (57) formée sur un corps fixe (6) de ladite soupape de vidange (5). 35

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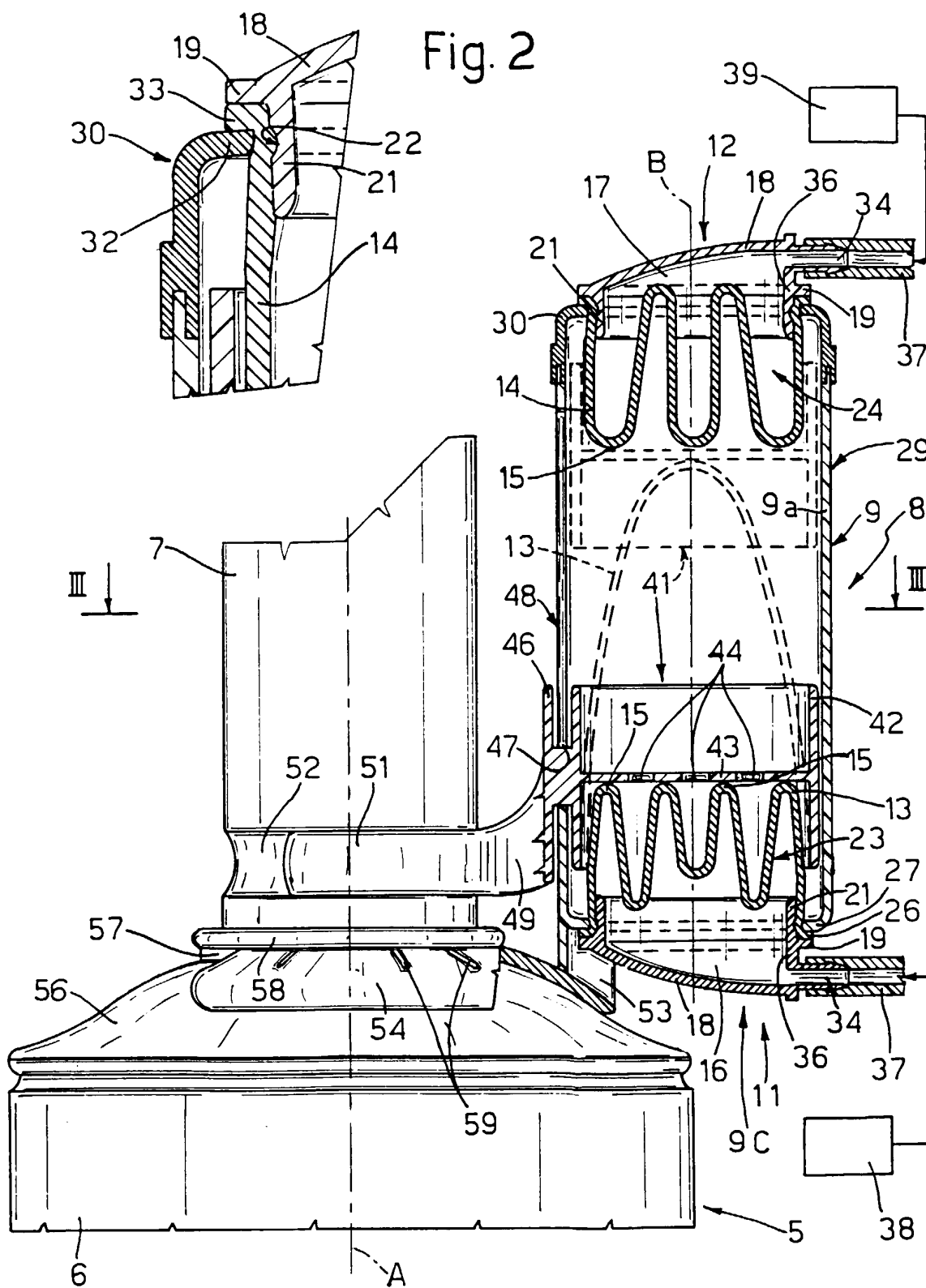


Fig. 1

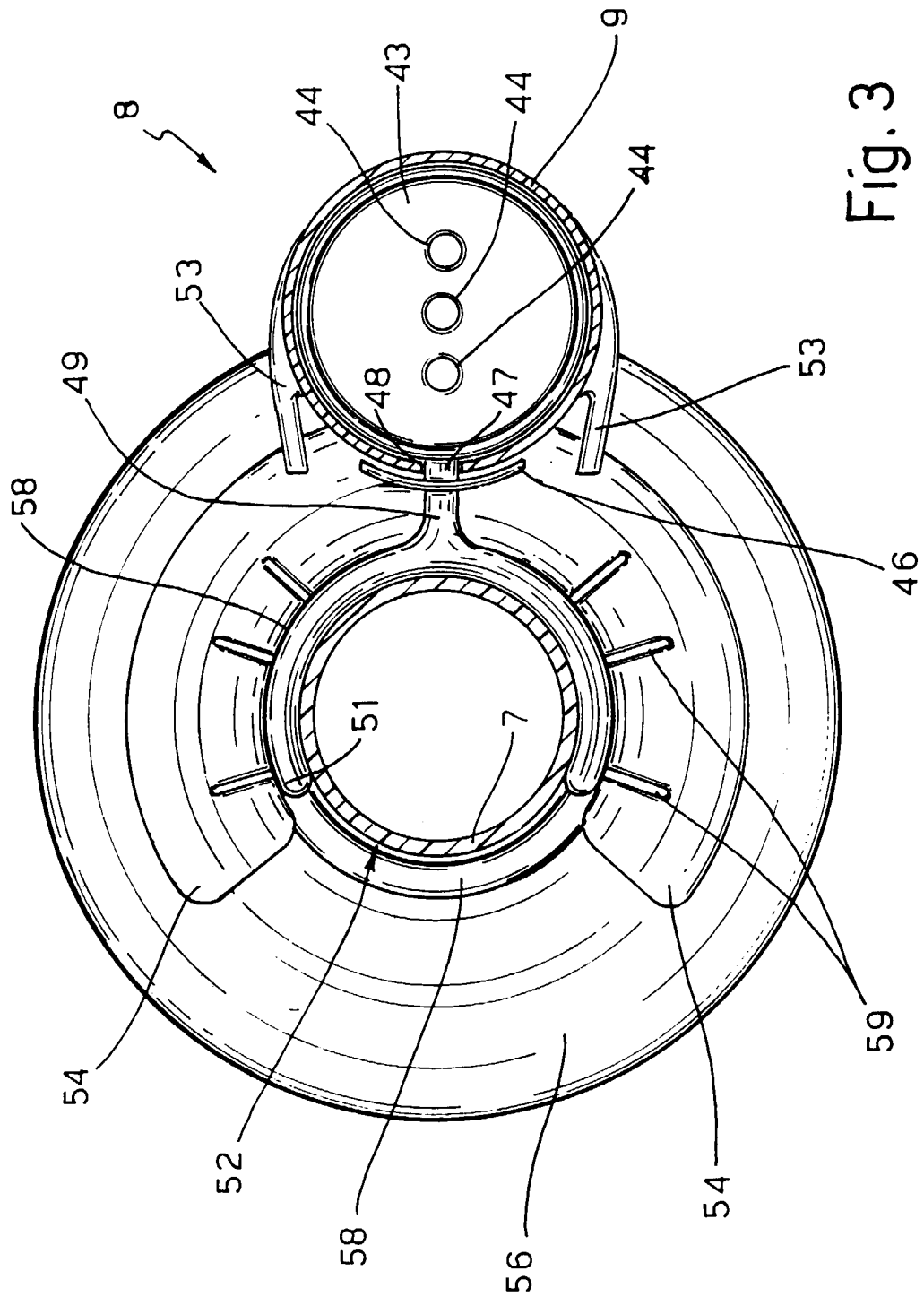


Fig. 3