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(54) **Assembly for pneumatically controlling a flush tank**

(57) An assembly for pneumatically controlling a flush tank has an actuating pipe (2) housed inside a corrugated pipe (3) in turn housed inside a wall (4) having a seating surface (7), a seat (8) for housing the corrugated pipe (3), and an opening (9); and a bush (5),

which is fittable to the corrugated pipe (3) and to a supporting element (4, 7; 20) integral with the wall (4), and has a hole (11) for the passage of the actuating pipe (2).

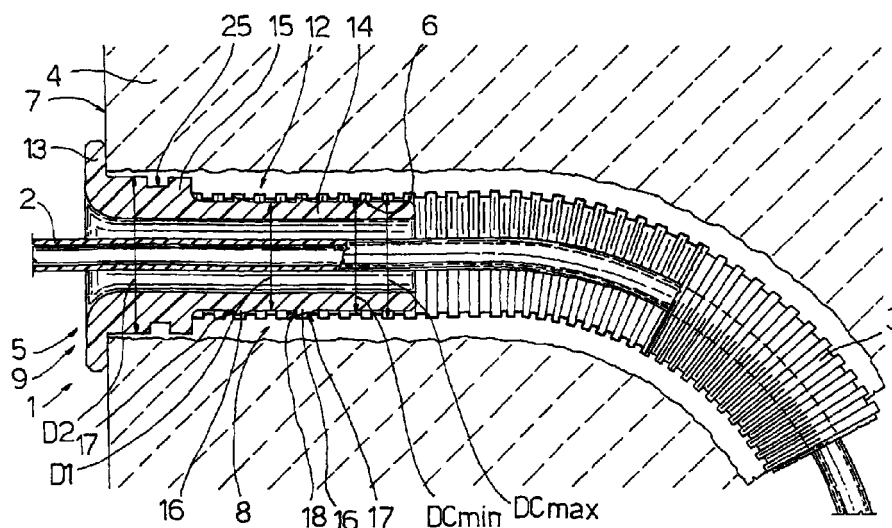


Fig.1

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Description

[0001] The present invention relates to an assembly for pneumatically controlling a flush tank usable to form sanitary fittings.

[0002] More specifically, the present invention relates to an assembly for pneumatically controlling a flush tank, and of the type in which a manually operated user control member and a tank discharge actuating member - both comprising respective pneumatic actuators - are connected by an actuating pipe housed inside a masonry wall.

[0003] The actuating pipe is normally made of flexible plastic material, is fitted through a corrugated pipe inserted beforehand inside a seat in the masonry wall, and is accessible at the ends of the corrugated pipe, from the mouths of which the actuating pipe projects for connection to the actuators.

[0004] A certain amount of clearance is normally left between the seat and the corrugated pipe to allow the corrugated pipe, unless it is cemented in, to move inside the seat. For this reason, the corrugated pipe is installed inside the wall so that at least the end of the corrugated pipe facing the flush tank projects with respect to a seating surface of the wall against which the flush tank is normally fitted on the outside of the wall or inside a recess formed in the wall and defined at the rear by the seating surface. This means the corrugated pipe must be cut after installing the flush tank and inserting the actuating pipe inside the corrugated pipe of the control assembly, which takes considerable time, particularly in view of the difficulty posed by cutting the corrugated pipe with the actuating pipe already inserted.

[0005] Conversely, if the corrugated pipe is not cemented in, with the end/s flush with the seating wall, the ends, on account of the clearance between the corrugated pipe and the seat, may slip back inside the seat, thus seriously impairing the function of the corrugated pipe which is that of guiding and protecting the actuating pipe. On the other hand, cementing the corrugated pipe beforehand inside the seat in the wall is awkward and not always possible.

[0006] It is an object of the present invention to eliminate the above drawbacks typically associated with the known state of the art.

[0007] According to the present invention, there is provided an assembly for pneumatically controlling a flush tank, the assembly comprising an actuating pipe housed inside a corrugated pipe housed inside a wall; said wall comprising a seating surface, a seat housing said corrugated pipe, and an opening located along said seating surface; said opening affording access to said seat; and said assembly being characterized by comprising a bush fittable to said corrugated pipe and to a supporting element integral with said wall; said bush having a hole for the passage of said actuating pipe.

[0008] 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 section, with parts removed for clarity, of a flush tank control assembly in accordance with the present invention;

Figure 2 shows a section, with parts removed for clarity, of a variation of the Figure 1 assembly;

Figure 3 shows a partly sectioned view in perspective of parts of the Figure 1 and 2 assemblies;

Figure 4 shows a view in perspective of parts of the Figure 2 assembly.

[0009] Number 1 in Figure 1 indicates as a whole an assembly for pneumatically controlling discharge of a known flush tank not shown in Figure 1.

[0010] Assembly 1 comprises an actuating pipe 2; a corrugated pipe 3 housed inside a wall 4 and for guiding and protecting pipe 2; and a bush 5 for fixing the end of corrugated pipe 3 to wall 4.

[0011] Actuating pipe 2 is a hose made of synthetic material and connecting a pneumatic control actuator (not shown) to a pneumatic operating actuator (not shown).

[0012] Corrugated pipe 3 is a hose of plastic material with a circular section varying between a value DC_{min} and a value DC_{max} , and comprises, along the inner surface, a succession of annular grooves 6 formed by the differences in diameter.

[0013] Wall 4 comprises a seating surface 7, either on the outside or defining the rear of a recess for housing the flush tank and formed inside wall 4 or between wall 4 and a known false outer wall (not shown); a seat 8 for housing corrugated pipe 3; and an opening 9 located along surface 7 and enabling access to seat 8.

[0014] Bush 5 is located at opening 9, is fixed to one end of corrugated pipe 3, and rests on surface 7.

[0015] With reference to Figures 1 and 3, bush 5 has a longitudinal axis 10; a hole 11 extending along axis 10 and permitting passage of pipe 2; a tubular body 12 extending along axis 10; and an annular flange 13 substantially perpendicular to axis 10 and integral in one piece with tubular body 12.

[0016] Tubular body 12 comprises an end portion 14 having a diameter $D1$ and insertable inside said corrugated pipe; and a portion 15 having a diameter $D2$ greater than diameter $D1$, and integral with end portion 14 and flange 13.

[0017] Portion 14 comprises at least two lock rings 16, which are integral with portion 14, are located in succession along axis 10, and click inside grooves 6 on corrugated pipe 3.

[0018] Each ring 16 extends about axis 10 and comprises a wall 17 sloping with respect to axis 10 and located on the side facing the free end of bush 5, and a wall 18 substantially perpendicular to axis 10 and located on the side facing flange 13. In other words, wall 17 facilitates insertion of bush 5 inside corrugated pipe

3, while wall 18 cooperates with grooves 6 to prevent withdrawal of bush 5 from corrugated pipe 3.

[0019] Assembly 1 is installed as follows. Corrugated pipe 3 is inserted inside seat 8, with an end projecting with respect to surface 7 of wall 4; the projecting end of corrugated pipe 3 is cut; bush 5 is inserted inside corrugated pipe 3; and pipe 2 is then also inserted inside corrugated pipe 3.

[0020] Bush 5 is inserted inside corrugated pipe 3, so that rings 16 engage grooves 6 on corrugated pipe 3, until the end of corrugated pipe 3 comes to rest against portion 15, which is inserted inside seat 8, while flange 13 comes to rest against surface 7 of the wall to prevent the end of corrugated pipe 3 from being drawn inside seat 8 and away from opening 9.

[0021] Figure 2 shows a variation 1a of assembly 1 described above, in which any details similar to or identical with those already described are indicated for simplicity using the same reference numbers. In this case, assembly 1a is applied to a flush tank 19 fitted, as will be seen, with bush 5 and corrugated pipe 3, so that, in this variation, flush tank 19 also forms an integral part of assembly 1a.

[0022] Flush tank 19 comprises a wall 20 having an inner surface 21, an outer surface 22, and a hole 23 in which portion 15 of bush 5 is fitted.

[0023] Assembly 1a also comprises a C-shaped locknut 24 which fits inside an annular seat 25 on portion 15 of bush 5.

[0024] Assembly 1a is installed as follows: bush 5 is inserted inside hole 23 and locked by means of locknut 24 fitted inside seat 25; portion 14 of the bush is inserted inside corrugated pipe 3; and tank 19 is fitted to wall 4, against or facing surface 7, in known manner not shown.

Claims

1. An assembly for pneumatically controlling a flush tank, the assembly comprising an actuating pipe (2) housed inside a corrugated pipe (3) housed inside a wall (4); said wall (4) comprising a seating surface (7), a seat (8) housing said corrugated pipe (3), and an opening (9) located along said seating surface (7); said opening (9) affording access to said seat (8); and said assembly being characterized by comprising a bush (5) fittable to said corrugated pipe (3) and to a supporting element (7; 20) integral with said wall (4); said bush having a hole (11) for the passage of said actuating pipe (2).
2. An assembly as claimed in Claim 1, characterized in that said bush (5) has a longitudinal axis (10), and comprises a tubular body (12) extending along said axis (10), and an annular flange (13) substantially perpendicular to said axis (10) and integral with said tubular body (12).
3. An assembly as claimed in Claim 2, characterized in that said tubular body (12) comprises a first portion (14) having a given first diameter (D1); said first portion (14) being insertable inside said corrugated pipe (3).
4. An assembly as claimed in Claim 3, characterized in that said first portion (14) comprises at least one lock ring (16) integral with said first portion (14); said corrugated pipe (3) having a number of grooves (6) for housing said ring (16).
5. An assembly as claimed in Claim 4, characterized in that said ring (16) extends about said axis (10), and comprises a first wall (17) sloping with respect to said axis (10), and a second wall (18) substantially perpendicular to said axis (10).
6. An assembly as claimed in one of Claims 3 to 5, characterized in that said supporting element is defined by said seating surface (7) of said wall (4) and by the wall (4) itself; said flange (13) resting, in use, against said seating surface (7).
7. An assembly as claimed in one of Claims 3 to 5, characterized in that said flush tank (19) forms an integral part of the assembly (1a); said supporting element being defined by the flush tank (19) itself.
8. An assembly as claimed in Claim 7, characterized in that said tubular body (12) comprises a second portion (15); said second portion (15) having an annular seat (25); and said assembly also comprising a C-shaped locknut (24) selectively insertable inside said seat (25) to grip a wall (20) of said flush tank (19) between said flange (13) and said locknut (24).
9. An assembly as claimed in Claim 8, characterized in that said second portion (15) is located between said first portion (14) and said flange (13), and has a second diameter (D2) greater than said first diameter (D1).

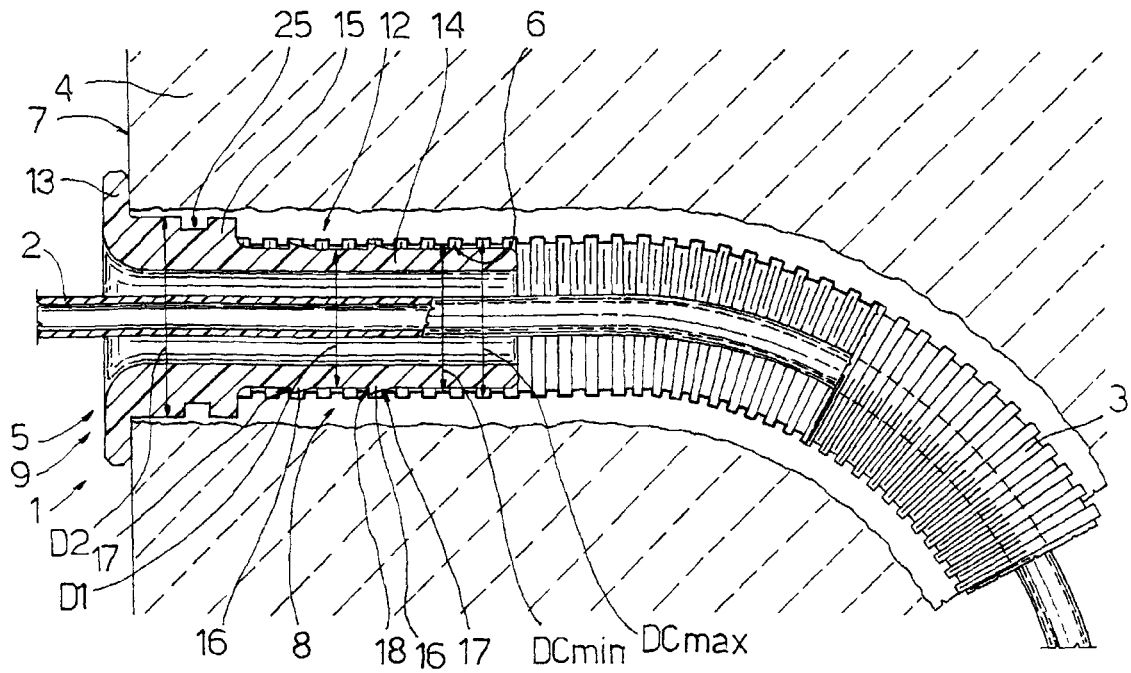


Fig.1

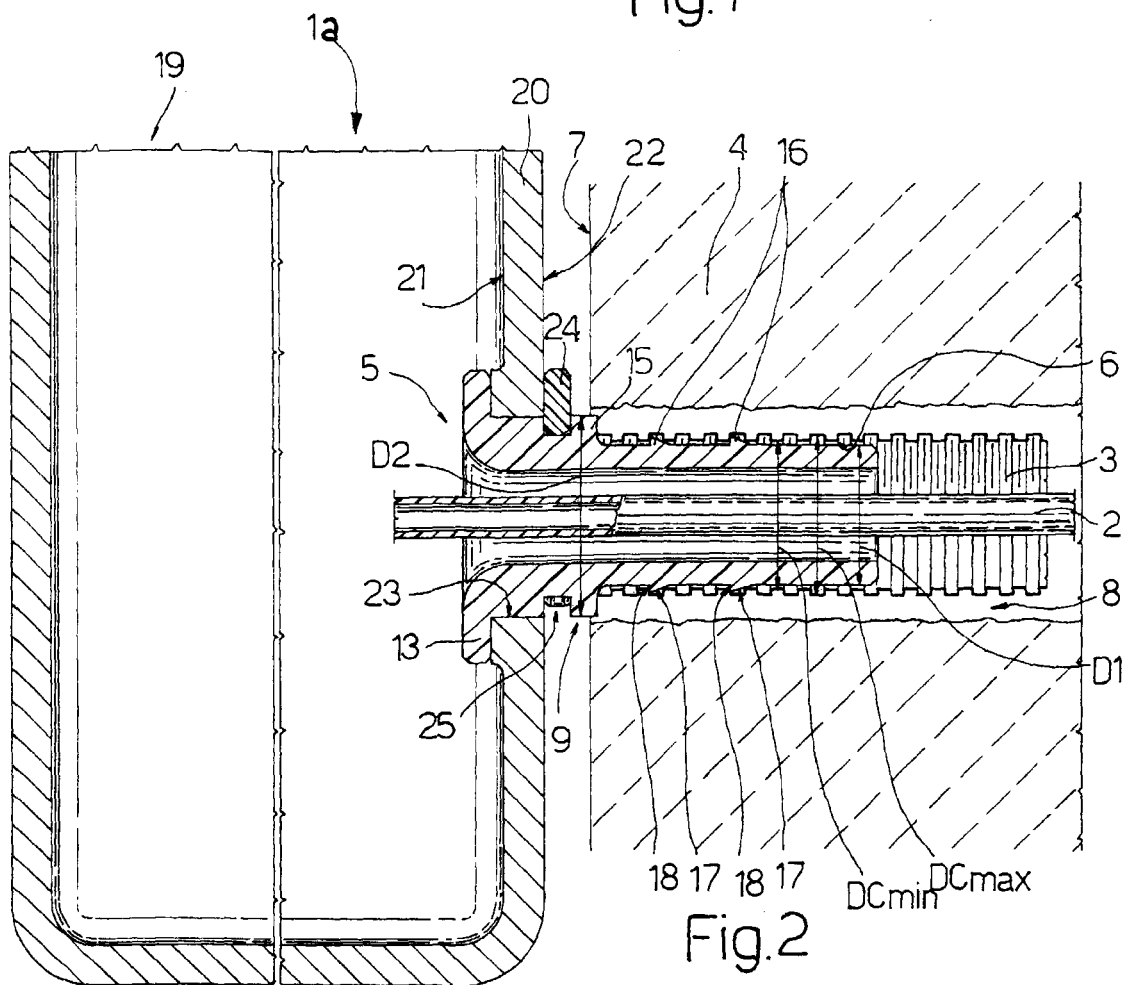


Fig.2

