(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 177 675 A1**

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
21.04.2010 Bulletin 2010/16

(51) Int Cl.:
E03D 1/14 *(2006.01)* ***E03D 1/34*** *(2006.01)*

(21) Application number: **09173321.2**

(22) Date of filing: **16.10.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
AL BA RS

(30) Priority: **17.10.2008 AR P080104526**

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(54) Dual-flush valve for cistern

(57) The flush valve comprises an upper valve (3) and a lower valve (7) connected in series and mounted on a tube (2) of different sections. Operating the push-button up to half of its way pulls up a filar element (1) fixed to said tube (2) thus moving it and opening the upper valve (3) which makes water pass from the toilet bowl tank through inlet holes (b) and circulation holes (c) into the main tube (4). During the operation, the tube (2) remains guided within a hub-hole (d) in the cover (5) and within the centering device (6). The operation of the push-button all the way down, displaces the tube (2) upwards dragging the upper valve (3) fitted to it and the cover (5) to open the lower valve (7) being fixed to the main tube (4) at the lower external end. The displacement is directed by a guide (8) and enables emptying the entire toilet bowl tank. The above mentioned guide (8) and a retainer (10) which closes the passage towards the downpipe (e) are both connected to the lower valve seat. Said seat (9) provides several holes (f) for drainage of the water contained in the toilet bowl tank.

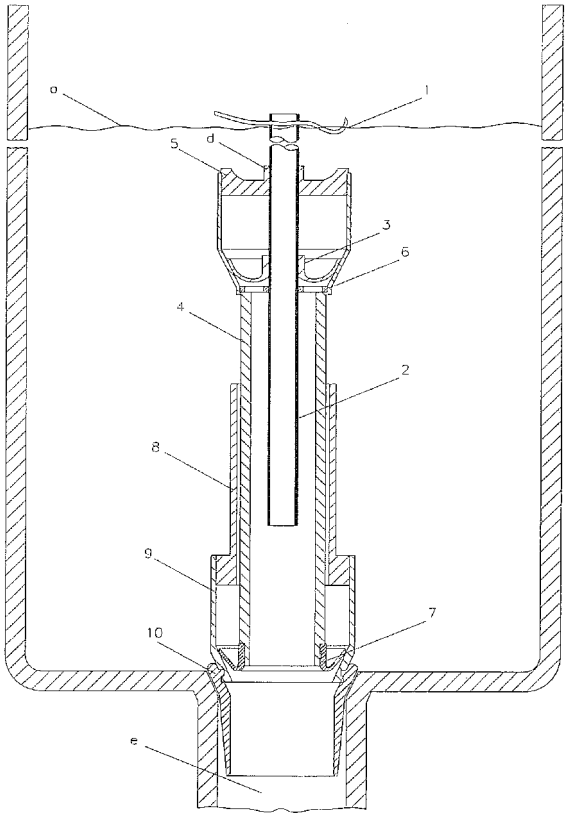

FIG. 1

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Description

[0001] In order to make this invention comprehensible and to enable it to be put into operation without difficulties, the following paragraphs will give a precise description of a preferred manner of realizing it. Reference will be made to the drawings that illustrate and accompany the description as examples of said way of realizing it, but neither the description nor the diagrams should be considered as limiting the invention. The components explained may be selected from among multiple equivalents, without this implying a deviation from the principles established in the present documentation.

PRIOR ART:

[0002] The inventor knows about several embodiments hereinafter analyzed.

Consequently, Patent Number CA2416848 is analyzed which refers to a dual capacity flush valve assembly where the dual-flush flapper valve assembly, set for a normally short flush, is provided for use with a pivoting flapper valve in a flush tank. The assembly comprises a weight, which moves back and forth along a guide relative to the flapper's pivot point. The moveable weight, if activated, temporarily reduces the turning movement of the flexible arm of the flapper ensuring a long flush. The assembly further comprises an actuator to trap and release the weight, resulting in either a short flush (when the weight is remote from the pivot) or a long flush (when the weight is close to the pivot).

[0003] The flipper assembly is engageable through a resistance force, for selectively triggering the actuator, shifting the weight and resulting in a long flush. After a long flush the assembly resets for a short flush, until it is activated once again.

[0004] Patent Number CN 1284591 is also analyzed which refers to a double flush appropriate for personal hygiene items and double channel water deposit of toilet water. Said invention is based in on the fact that the water coming from a pipe has a great impulse while the water from a water tank has a great flush rate, the water fill valve has a double control to make the pipe water first flush the toilet and then recover the water from the tank. The oscillating regulation and flush valve used as ancillary to economize water results in the precise control of water consumption and has several optional flush functions. This device is especially appropriate to be used from the foregoing for a toilet with double water channel and can be used to replace the available devices of the flush tank.

[0005] Patent Number CN1584229 refers to a Double-row pressure-type flushing system. The invention is related to a double row flush system of the pressure type. Said system includes pressure cistern, water intake valve, air intake combined valve, double-row water discharge valve and opening valve for controlling the double-row water discharge valve. Said invention also provides their connection relationship and their respective function, and when compared with traditional pressure-type flushing system, said invention can implement double discharge function so as to save more can water.

[0006] Patent Number DE3319649 refers to an economic dual flush-volume outflow valve to reduce the domestic-water requirement in WC flushing operations, an outlet valve is designed as a dual valve having two outlet planes, for emptying a partial quantity or the entire quantity of water stored, as desired.

[0007] Patent Number DE4236464 refers to a Leak-free double valve with separate cleaning facility. The two valves (12,13) operate in series and have a trapped space (8) which is vented via a vent hole (9) and a bore (10) through an extension of the valve rod (15) for the lower valve. A sleeve (16) sliding telescopically on the valve rod operates the upper valve. The operating cylinder has a main piston and three control pistons to operate the two valves together or separately. For separate operation each valve is lifted independently while the other is held closed by a combination of spring pressure and hydraulic pressure. The valve travel is limited by stops inside the control cylinder. A main spring (21) provides the main closing force for the valves, with a second spring (24) to control the relative pressure between the two valves.

[0008] Paten Number GB 2300006 refers to a dual flush device for a valve-flush toilet cistern.

[0009] Said toilet flushing mechanism includes a dual flush device for effecting both a short flush cycle and a long flush cycle in a toilet tank including a flush valve actuated by an actuation arm. A cam operable by a handle has a rotatably supported stand adjacent to the actuation arm. When rotated in a first direction, the cam acts to press against and pivot the actuation arm to effect the short flush. A lever is pivotably supported with respect to the actuation arm and pivots between a first position out of blocking contact with the actuation arm and a second position where the lever blocks return of the actuation arm for a predetermined period of time when the cam is rotated in the second direction. A float is coupled to the lever for determining the predetermined period of time. The float acts to pivot the lever into the second position when the cam is rotated in the second direction.Patent Number JP8302782 refers to a toilet drainage system having water economizing function.

PROBLEM TO BE SOLVED: To obtain improved double drainage systems, in which water is saved, by selecting long flushing or short flushing by selecting the rotation of one handle by a user and selectively driving one drainage valve. SOLUTION: A handle 32 is rotated in the counterclockwise direction in a front view in the case of long flushing. The pawl nose section 43 of a cam 42 is brought into contact with the upper section of the second arm 36 of a driving lever 34 by the rotation. Consequently, the first arm 35 is lifted, and a flapper 64 is lifted from a valve seat 62. The movement of the arm 35 is controlled by a cutoff wall 90. On the other hand, the handle 32 is rotated

in the clockwise direction in the case of short flushing. The pawl nose section 44 of the cam 42 is brought into contact with the lower section of the arm 36 by the rotation.

[0010] Accordingly, the arm 35 is lifted less than in the case of long flushing. Since the pawl nose section 43 is brought into contact with the upper section of the cutoff wall 90 and the revolution excess of the lever 34 is prevented at that time, the flapper 64 is not elevated from the valve seat 62 up to height in the case of long flushing.

[0011] Patent Number SE506105 refers to a toilet cistern valve assembly for large or small quantity flushes. The cistern (2) has a flush valve assembly casing (1) open at the lower and connected to the toilet flush pipe. Rectangular openings on opposite sides of the casing are connected by a box structure (7) allowing the surrounded water (4) to reach the two conical nesting valves (10, 20). Each valve has a cone (12, 22) and a valve seat (11, 21), and are shaped and sized to allow the lower valve (10) to nest fully in the upper valve (20). The double valve assembly is controlled by a guide rod (15) attached to the valve (10) and slidable in the tubular rod (25) fixed to valve (22), and operated by knob (31).

Patent Number SI 9600037 refers to a bidet which comprises a plastic sanitary vessel, which is adapted to the opening and depth of a toilette bowl and it is used for the personal hygiene, namely for washing and splashing of genital area; it can be placed in the bathroom with toilette bowl and the lavatory without bidet. The bidet should be inserted in a toilette bowl in such way to lay with its wide edge (3 - 4 cm) over the edge of a toilette bowl. It is made of flexible plastic, and its volume is adapted to a toilette bowl.

[0012] The water should be poured in a bidet from the sink or bath tub next to the toilet bowl before it is inserted in the toilet bowl, or, if the empty bidet has already been inserted, from another holder, or by a special pipe, connected to the double valve next to the toilet cistern. It can be emptied directly into the toilette bowl by tipping the bidet or unplugging it. It can be stored by hanging on the wall or inserting it in a special stand behind or next to the toilet bowl, under the sink or similar.

[0013] Patent Number US2002148037 refers to A dual inlet valve system for gravity operated toilets.

[0014] A flush valve system is constructed of a single housing having at least two inlets fluidly connecting to a single outlet. Preferably, the system includes a flush handle assembly having at least two handles mechanically connected to and at least two linkages. Both linkages pass through a sleeve assembly, which is mounted on the standard mount hole provided on conventional gravity flush toilet tanks to provide effective control for the dual inlet flush valve. The inlets are sealed with a primary and a secondary flapper valve that are preferably connected by a chain or other link to at least two linkages. This system permits the user to conserve water by selective flushing of a large or small volume of water.

[0015] Patent Number US2004111793 refers to a toilet cistern dual flush valve. The invention provides a toilet cistern dual flush valve (10) operable selectively in a full flush mode in which a relatively large volume of water is discharged from the cistern or a partial flush mode in which a relatively small volume of water is discharged from the cistern. The dual flush valve (10) comprises a stem (36) carrying a valve closure (38) seatable on an outlet from the cistern, means to raise the stem (70, 72,74), buoyant means (50) attached to the stem (36) which in the full flush mode maintains the stem (36) in the open position until the relatively large volume of water has been discharged and the buoyant means (50) loses buoyancy whereafter the stem (36) descends under gravity to the closed position, and means (54) which operates in the partial flush mode to add sufficient mass to the stem when the relatively small volume of water has been discharged causing the stem (36) to descend to the closed position.

[0016] Patent Number US2005028262 refers to a Dual flush toilet valve within a flush tank. The present invention is a dual flush valve within a flush tank. Each valve 1 and 2 work independently of the other with the discharge openings in communication with the flush tank outlet and the inlet opening of the toilet bowl.

[0017] Separate operator handles are provided for the flush valve 1 which also includes valve 2 for the full and partial sides of the valve so that the appropriate flush valve can be selectively opened to dispose of waste material. The present invention can be used in three different circumstances. As shown in FIG. 3 used in conjunction with the existing flush valve. Use with new tank construction and eliminate FIG. 5 and FIG. 6 by adding a second handle hole in the tank wall. Standard commercial handles and levers can then be used.

[0018] Patent Number US2005044614 refers to a flush valve adapter. The present invention is a flush valve adapter that will provide a dual flush. This is installed within a new or existing flush tank. The discharge opening is in communication with the flush tank outlet and the inlet opening of the toilet bowl. Separate operator handles are provided for the flush valve adapter so that the appropriate flush handle can be selectively used to dispose of waste material. The present invention can be used in two circumstances: 1. As shown in FIG. 2 used in conjunction with the existing flush valve. 2. Use with new tank construction and eliminate FIG. 3 and FIG. 4 by adding a second handle hole in the tank wall. Standard commercial handles and levers can then be used.

[0019] Patent Number US2005247899 refers to a double valve flusher. A double valve flusher includes a body, a separating plate, an upper and a lower valve base, a movable valve, a flat valve, a mixer member, and an electromagnet. An upper leak room is formed between the flat valve and the upper valve base. A leak room is formed between the separating plate, the lower valve base and the movable valve contained in a chamber in the body. The upper leak passageway in the upper leak room and the upper valve base is blocked and opened by the core

of the electromagnet, thus controlling the flat valve in disfiguring to block or open the leak passageway of the leak room and the lower valve base. Then the movable valve is controlled to move up and down to flush or stop the flushing water into a urinal where this flusher is positioned.

[0020] Patent Number US4173801 refers to an apparatus for flushing toilets systems. A double valve construction selectively provides a full flush or a partial flush from the tank of a toilet. The apparatus, which may be utilized to modify existing toilet water closets, includes a manifold mounted on the tank in communication with an outlet for draining water from the tank. The manifold includes a pair of valve seats, one located proximate to the bottom of the tank and the other one located distant from the bottom of the tank. An actuating mechanism selectively operates a pair of valves associated with the valve seats and is so arranged that when an operating handle is turned in one direction, it disengages the upper valve from the upper valve seat for a partial flush and when the operating handle is moved in the opposite direction, it disengages the lower valve from the lower valve seat for a full flush.

[0021] Patent Number US5400444 refers to a double flush toilet valve. A double flush toilet valve apparatus for permitting full and partial flushes of a toilet water tank by providing a vent hole in the toilet flush valve float which can be opened by an extended additional force actuation of the toilet flush handle to permit flooding of the float valve and premature closing of the discharge outlet of the toilet tank which is regulated by a float which is attached to the actuation chain of the toilet valve. The vent hole is regulated by a flapper seal and a flapper seal actuator disposed within the flush valve float.

[0022] Patent Number W02005073477 refers to a dual capacity flush flapper valve assembly. A dual-flush flapper valve assembly (1), set for a normally short flush, to be used with a pivoting flapper valve (3) in a flush tank. The assembly comprises a weight (6), which moves back and forth along a guide (7) relative to the flapper's pivot point. The moveable weight (6), if activated, temporarily reduces the turning moment arm of the flapper (3) for ensuring a long flush. The assembly (1) further comprises an actuator (8, 9) to trap and release the weight (6) resulting in either a short flush (when the weight (6) is remote from the pivot) or a long flush (when the weight (6) is close to the pivot). The flapper assembly (1) is engageable through a resistance force, for selectively triggering the actuator (8, 9), shifting the weight (6) and resulting in a long flush. After a long flush the assembly (1) resets for a short flush, until it is activated once again.

[0023] Patent Number WO2006068457 refers to a dual flush valve for toilets. The invention relates to a dual flush valve for toilets. The invention is **characterized in that** the level of water to be discharged can be selected by moving the external handle of the storage tank either upwards or downwards in order to clean the toilet according to the manner in which it was used, e.g. in order to remove liquid or solid waste. In this way, the invention saves water, provides optimal hydraulic pressure in the two seals positioned at the same level and, consequently, provides an equal water column for both. The amount of water to be discharged is controlled by positioning the float on the actuation chain at the desired water level or using a controlled-diameter regulator.

[0024] Patent Number WO2006086916 refers to a double rush water control equipment for the toilet bowl. A doubled rush water control equipment for the toilet bowl, comprises an inlet water pipe, an inlet control part, an outlet pipe, an outlet control part, and a fluid volume control part. A plunger installed with a block and a crook closes the outlet pipe. The outlet control part comprises a valve, which connects with the inlet pipe. The valve is composed by a first outlet and a second outlet. Both outlets form the two cavities individually, and both cavities connect the pipes, which are controlled by the button outside individually. The other pipe that is closed by the plunger in the end connects the first pipe. The fluid volume control part comprises a plunger chamber, which sets the plunger sticks inside and connects the second outlet. Beside the plunger, it is composed by a float for fluid volume control which articulates a crook in the button. The crook conjugates with the block of the plunger; disposed with a float between the plunger stick and the plunger, the float includes a hole, which links the crook of the plunger. When using the pressurized water, the drainage and water entering are credible and fast controlling; the drainage with different fluid volume economizes water.

[0025] Patent Number WO9112381 refers to a toilet flushing mechanism. A toilet flushing mechanism (10) to be used inside a toilet tank (12), having an exit port (14) and a flush lever (16). The toilet flushing mechanism (10) includes a central riser (18) having a first outlet port (20) at the top of the central riser (18) and a minor riser (23) spaced vertically apart from the first outlet port (20) and extending out from the central riser (18) near the bottom of the central riser (18). A second outlet port (22) is located on the top of the minor riser (23). A first arm (30) attaches to the flush handle (16) and to a first stopper (26) via a first chain (36). A first linkage arm (32a) and a second linkage arm (32b) are pivotally coupled together and the second linkage arm (32b) is pivotally coupled to the central riser (18) at pivot point (34). The first linkage arm (32a) attaches to the first arm (30) at a joint (31) and a second stopper (28) attaches to the second linkage arm (32b), via a second chain (38).

[0026] Patent Number AR009893A4 is analyzed. By means of said improvements a device is achieved that in general terms, comprises a tubular body part of an inner liquid passage and which has a telescopic end connected to an external push button. It also comprises a valve shutter with its seat on a bottom part that, next to the flush outlet, constitutes a re-railing guide for the tubular body slide. When the external push button is pressed, the lever takes the tubular body upwards, and

the ring valve shutter is separated from its seat in the slide part by means of the tubular slide along the re-railing guide. Under these conditions the tank liquid passes through the valve seat area to get out from the flush outlet composed by the coupling means.

[0027] As it can be concluded from the documents above mentioned intended to reduce the amount of water used for toilet tanks flushing, they are mainly directed to be elements of great complexity due to the amount of parts, which derives in higher costs, more probability of malfunctioning and more space required for the device usage.

[0028] The solution contributed in this invention consists of the reduction in the amount of water being used for toilet flush by means of a simple and economic manufacturing device with no maintenance and repair, and a size adaptable to standard toilet tanks.

[0029] For patent DE3319649 it is necessary to have a double set of driving levers which determines a greater amount of parts and most of all the unavailability to be applied to standard toilet tanks.

[0030] Patent SE506105 reveals a casing arranged in the cistern where the flush valve is mounted. Said valve is normally open, at the bottom of the cistern and connected to the toilet flush pipe. Two Rectangular openings on opposite sides of the casing are connected by a box structure allowing the water passage to reach the two conical nesting valves. Each valve has a cone and a valve seat and are shaped and sized to allow the lower valve to nest fully in the upper valve. The assembly of the two valves is controlled by a guide rod attached to the LOWER valve and it is slidable in the tubular rod fixed to an upper valve.

[0031] This is different from the proposed invention where the pressure exercised on the push button is the one that selects the flush conduit to be used to clean the toilet bowl.

[0032] For patent US2002148037 it is necessary to include a greater amount of components like a mechanisim for a flush handle assembly having at least two handles mechanically connected and at least two linkages, which means a bigger space available mostly for wall cisterns.

[0033] For patent US4185338 a greater quantity of components is necessary like the mechanism to keep the first valve in an open position until the complete flush has been achieved, the mechanism for emergency drainage, which needs more available space, not to mention the amount of necessary parts to resolve the model due to the technology employed and durability of the proposed materials proposed which are susceptible to corrode.

[0034] On the other hand, it can be observed that full or partial flush is achieved as a result of different travels of the operation handle, that actuates on a first valve in order to achieve the full flush of the toilet bowl. Such valve is kept open thanks to an appropriate mechanism to be kept in that position.

[0035] Furthermore, it can be observed that different from the proposed invention, the document analyzed actuates opening one of two valves disconnecting the other, that is to say using a double action and consequently, as it was above mentioned, using also a greater amount of parts.

[0036] For patent number US2004111793, it is necessary to have a greater amount of components like the mechanism for the means to raise the stem (70, 72,74), buoyant means (50) attached to the stem (36) which in the full flush mode maintains the stem (36) in the open position until the relatively large volume of water has been discharged and the buoyant means (50) loses buoyancy whereafter the stem (36) descends under gravity to the closed position, and means (54) which operates in the partial flush mode to add sufficient mass to the stem when the relatively small volume of water has been discharged causing the stem (36) to descend to the closed position, which brings about the need for a bigger and wider space available and this makes its application difficult mostly on wall cisterns.

[0037] In patent number US4173801 we have seen that the operation handle is rotated in one direction to disconnect the upper valve from its corresponding seat in order to achieve a partial flush and must be rotated in the opposite direction to disconnect the lower valve from the corresponding seat to achieve a full flush.

[0038] The construction described implies to have the appropriate means to disconnect selectively one of the two valves unlike the proposed invention which requires one single method as can be seen in the description.

[0039] Having analyzed the documents above mentioned, it is concluded that the same does not represent an obstacle to this application.

OBJECT:

[0040] The valve systems generally used for toilet bowl tanks from the prior art are characterized because they have one single possibility of water flush.

[0041] This circumstance means that most of the times the discharge exceeds the real cleaning need of the bowl considering that the volume of the matter being flushed is very variable.

[0042] Density is also variable, considering that the waste can be solid like feces, toilet paper, etc., or liquid like urine, water, etc.

[0043] According to what has been stated, it is to be observed that considering the different situations of bowl cleaning, the amount of cleaning water is constant.

[0044] It has been demonstrated that in some of the embodiments shown in the prior art, the inventor's concern is reflected in the possibility to vary the toilet bowl tank flush selecting the option to empty half the content of the same.

[0045] However, as it has been noticed when analyzing said documents, that possibility implies the use of complex arrangements which include several pieces.

[0046] The possibility to modify the amount of water

flushed implies that in many situations a rational use of a valuable resource can be made, considering that only 3% of the water is drinkable and that in many cases the volume used is excessive for the amount or characteristics of the waste.

[0047] Taking into account the growing problems of drinkable water supply and cost, it is evidently necessary the development of elements which permit a more effective use and saving of this non-renewable resource.

[0048] The invention purpose of this application provides the possibility to flush two water volumes, being one equivalent to approximately half the content of the toilet bowl tank, which permits the cleaning, removal and flush of elements with low volume and/or liquids and another equivalent to the whole content, which permits the cleaning, removal and flush of elements of higher volume and/or solid.

[0049] The valve that results object of this application is registered within those embodiments that enable a more efficient use of water and its consequent saving.

[0050] This invention which is being revealed can be applied to standard toilet water bowls and cisterns which are in use, being their cost lower than the mechanisms described in the prior art, due to the valve seat system, their reduced size, and the simplicity of the mechanisms employed.

DRAWINGS:

[0051] In the attached Figure number 1 a front view cut of the two valves in a closed position is schematized.

[0052] In a second print, Figure number 2 schematizes a front view cut where the first step of operation of the invention can be observed.

[0053] In a third print, Figure number 3 schematizes another front view cut where the second step of operation of the invention can be observed.

[0054] In the fourth print, Figure 4 schematizes a cut view of the upper part of the main tube, where the arrangement can be seen. The inlet and circulation holes can also be seen in this representation.

[0055] Lastly, and in said fourth print, in Figure number 5 a cut of the seat in its middle part has been schematized, where the arrangement and a number of holes for draining can be seen.

REFERENCES:

[0056] In the preceding described figure, the same characters for reference indicate equal or corresponding parts, being number -1- a filar element; number -2- a tube, number -3- an upper valve; number -4- a main tube, number -5- a cover; number -6-a centering device.

[0057] Reference number -7- is reserved to indicate a lower valve; reference -8- for a guide; reference -9- for a seat and reference -10- for a retainer.

[0058] Finally, letter -a- is to indicate a level of water, letter -b- to indicate some inlet holes; letter -c- to indicate some circulation holes; letter -d-to indicate a hub-hole; letter -e- to indicate a downpipe and letter -f- to indicate some draining holes.

DESCRIPTION:

[0059] Basically, the present development consists of an arrangement for the discharge of a variable volume for toilet tanks and toilet bowl tanks characterized by two valves connected in series and mounted on a tube of different sections. From said valves, the upper valve allows the discharge of approximately half the content of the toilet bowl tank which is driven down the inside of the main tube, while the lower valve allows complete discharge.

[0060] The amount of water drained with the driving of the upper valve is determined by the height where it is placed, and its opening is carried out by pushing the traditional button until half its travel.

[0061] When pushing the button up to the end of the travel, the upper valve makes contact against the cover raising part of the set and opening the lower valve which is supported in the lower seat of the device and mounted on the lower part and outside the main tube producing the complete discharge.

FUNCTIONING:

[0062] Having established the different components of the version of the invention, shown in order to explain their nature, this description is now complemented with the functional and operational explanation of its parts and of the result they provide.

[0063] This arrangement for the discharge of a variable volume for toilet tank and toilet bowl tank is of the type operated by a push button.

[0064] Said push button is connected to a flexible filar element -1- and long enough to be adaptable to the deposits available in the market nowadays.

[0065] Said filar element (1) is fixed to the tube -2- being adjusted thanks to its longitudinal trip in the position more convenient position according to the different distances present in the devices from the prior art.

[0066] In this manner, when the push button is pressed, the filar element (1) is pulled, and this displaces tube (2) upwards and opens the upper valve with ball seat -3- that is adjusted to said tube.

[0067] When said upper valve (3) is opened, the water contained in the toilet bowl tank enters inside the main tube -4- through the inlet holes -b- of the widened section of the tube as well as through the circulation holes -c- of the centering device -6-.

[0068] This discharge is produced at high speed, and allows flushing the toilet bowl dragging liquids and light solid elements deposited in said bowl.

[0069] Once the discharge is produced, said upper valve (3) is closed by the effect of the gravitational force.

[0070] During said operation the tube (2) is centered

and remains in that position as a consequence of the action of the hub-hole -d- of the cover -5-and by the centering device (6).

[0071] When the whole discharge of the fluid contained in the toilet bowl tank is to be performed, the push button is pressed to the end, this displaces the tube (2) upwards and the upper valve (3) adjusted to said tube.

[0072] Said upper valve (3) makes contact against the cover (5) pushing it and opening in this way the lower valve -7 which is supportive of the main tube (4) being fixed in the lower external end.

[0073] The movement is directed by the guide -8- and enables the whole emptying of the liquid contained in the toilet bowl tank in such a manner that the level of water -a- within the same is near a zero value.

[0074] The amount and speed of the fluid circulation so released from the toilet bowl tank, produces the whole flushing of the toilet bowl content and, once the discharge is finished, the lower valve (7) is closed by gravitation.

[0075] It is important to emphasize that in the first place, the seat -9- lets the lower valve (7) to be kept perfectly fixed in its place of functioning and secondly this seat allows adjusting to it the guide -8- and the retainer -10-

[0076] Said retainer (10) is made of elastomeric material and it permits to close the passage hermetically towards the downpipe -e- of the toilet bowl tank adapting itself to the different conditions that could present the toilet bowl tank according to the several models of toilets in the market at present.

[0077] Said seat (9) presents a plurality of draining holes -f- that allow the flushing of water contained in the toilet bowl tank for the whole emptying of the same.

[0078] It must be taken into account that at some moment the float may suffer some failure in its operation that may hinder total closing of the water income to the toilet bowl tank, in which case the upper valve has a discharge conduit connected to the tube (2).

[0079] In a preferred manner of embodiment the elements herein described are made of plastic.

[0080] The foregoing is a sketch of one of the possibilities of construction to put the invention into effect and of the manner in which it functions, and the documentation is now complemented with the synthesis of the invention contained in the following claims clauses.

Claims

1. **Arrangement for the discharge of variable volume for toilet tanks and toilet bowl tanks**, of the kind operated by means of a push button, presenting an upper valve (3) and a lower valve (7) connected to the ends of a tube (2) of the kind where the upper valve (3) and the lower valve (7) are supplied with ball seats;
   Characterized because the upper valve (3) and the lower valve (7) are connected in series and the tube (2) where these valves are mounted has different sections. The pushbutton operation halfway up to its travel, pulls a filar element (1) fixed to said tube (2) displacing it and activating the upper valve opening (3) which makes water pass from the toilet bowl tank through the inlet holes (b) and circulation holes (c) through the main tube (4);
   which hub-hole (d) of the cover (5) and centering device (6) fix the tube position (2) during said operation; the operation of the push button all the way down, displaces the tube (2) upwards dragging the upper valve (3) fitted to it and pushing the cover (5) to open the lower valve (7) supportive of the main tube (4) being fixed in the lower external end;
   which displacement directed by the guide (8) enables the emptying of all the liquid contained in the toilet bowl tank; said guide (8) and a retainer (10) which closes the passage towards the downpipe (e) are both adjusted to the lower valve seat (9). Said seat (9) provides several holes for drainage (f) of the water contained inside the toilet bowl tank.

2. Arrangement, according to Claim number 1, **characterized** because the filar element (1) is made of a flexible material and its length allows connecting tube (2) with the pushbutton.

3. Arrangement, according to claim Number 1, **characterized**, because the tube (2) displaces lengthwise adjusting itself to the distance present in the prior art devices.

4. Arrangement, according to Claim number 1, **characterized** because the inlet holes (b) are arranged in the widened section of the tube (2) and circulation holes (c) are arranged in the centering device (6).

5. Arrangement, according to Claim number 1, **characterized** because the upper valve (3) has a discharge conduit connected to the tube (2).

6. Arrangement, according to Claim number 1, **characterized** because the closing of the upper (3) and lower (7) valves is produced by the action of gravitational force.

7. Arrangement, according to Claim number 1, **characterized** because retainer (10) is made of elastomeric material and constitutes a hermetic sealing regarding downpipe (e) of the toilet bowl tank.

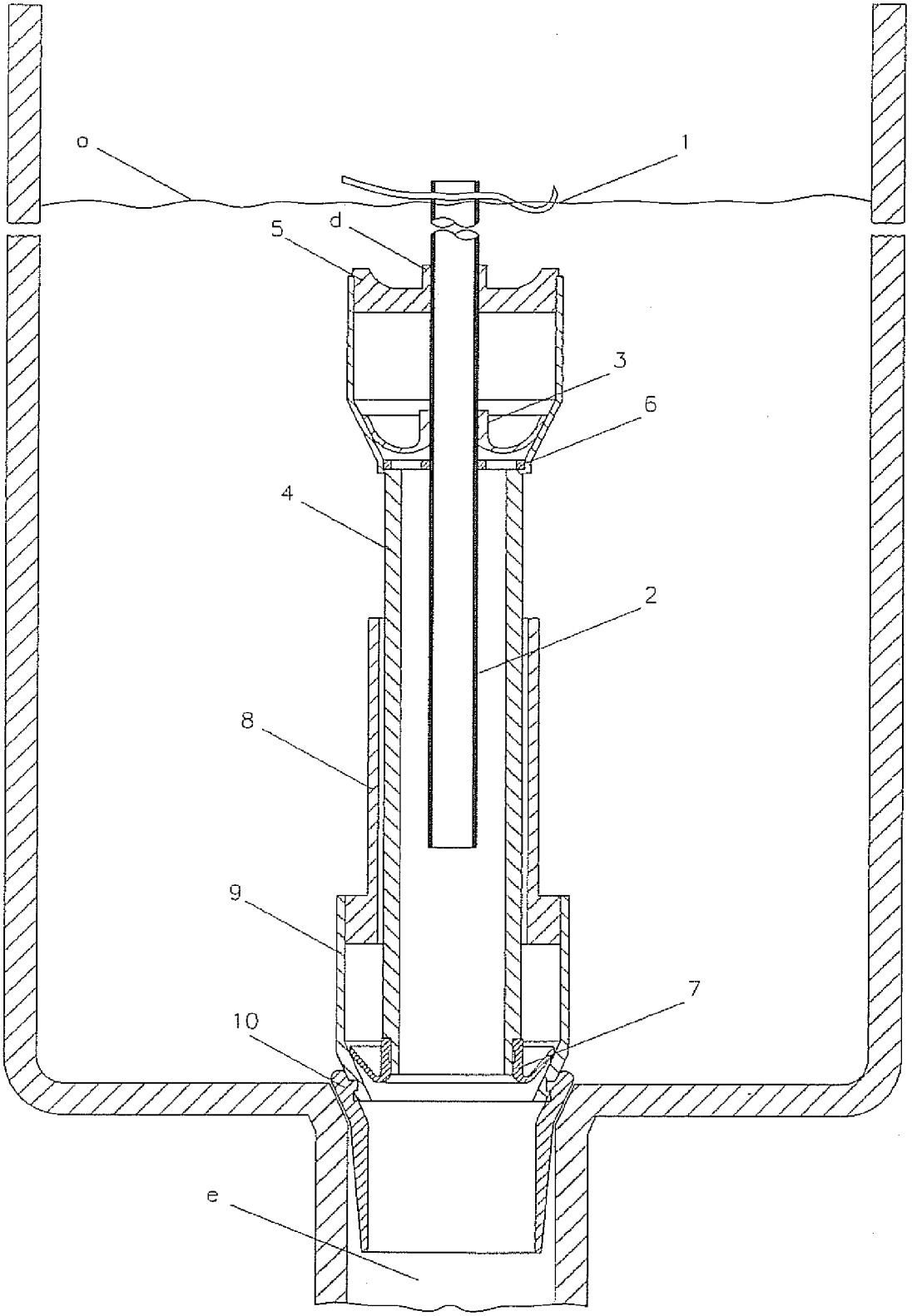

FIG. 1

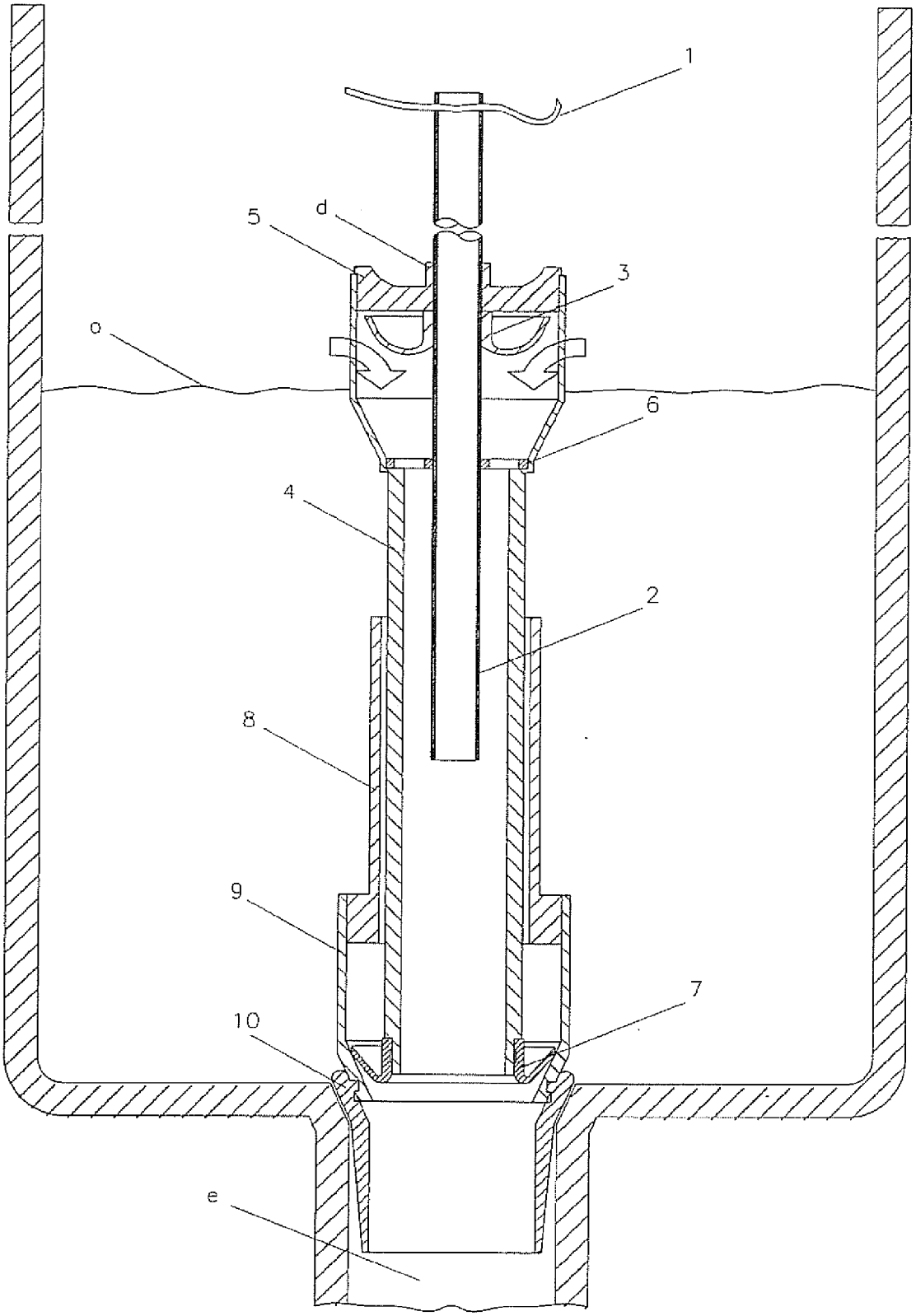

FIG. 2

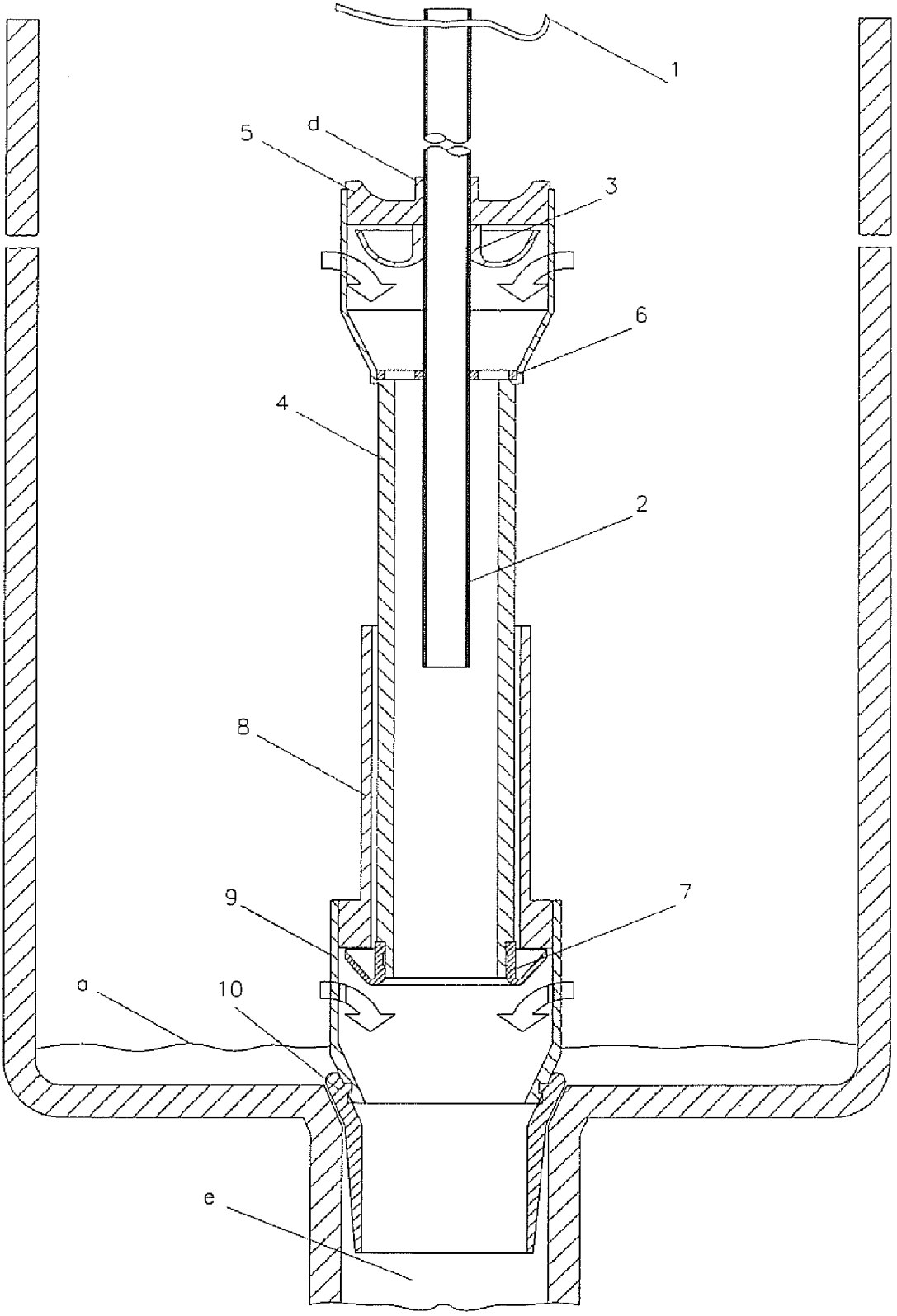

FIG. 3

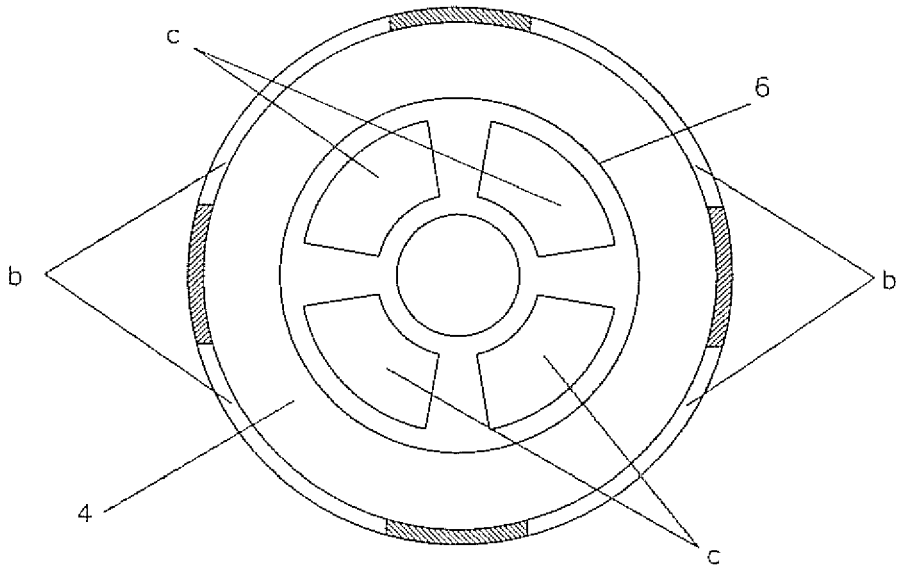

FIG. 4

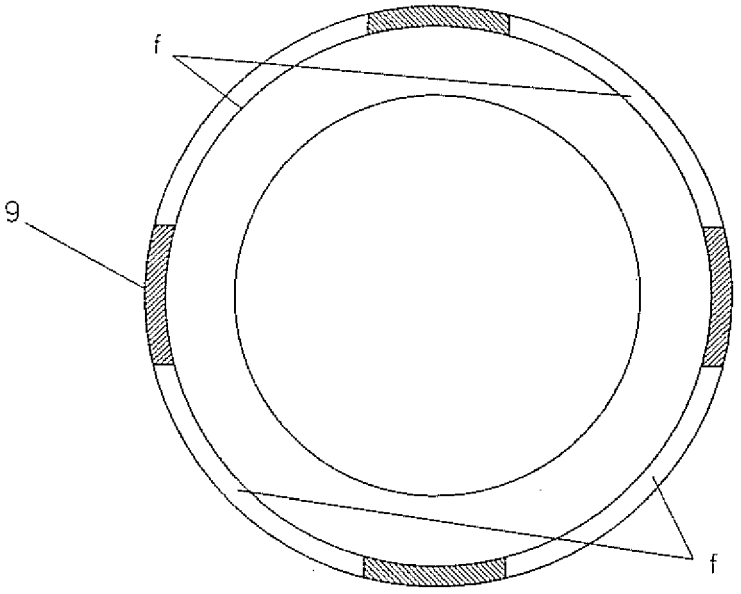

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 09 17 3321

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	25 January 2010	Geisenhofer, Michael

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