Title: STOPPERED DISCHARGE VALVE FOR CISTERN

Abstract: The subject of invention is a stoppered discharge, which is developed for use in reservoirs and able to work with various water volumes, comprises mechanical parts shown as a discharge bearing (1), a sealing gasket (2), a lantern (3), a discharge tube (4), a pull arm (5), a discharge bearing support (8), a Styrofoam clip (9), a Styrofoam (10), a segment (11), a discharge gasket (12), a Styrofoam lower plate (13), a pull arm connection part (16). Stoppered discharge system (A) provides or prevents water flow depending on up-and-down movement of pull arm connection part (16).
Declarations under Rule 4.17:
— as to the identity of the inventor (Rule 4.17(i))
— as to applicant’s entitlement to apply for and be granted a patent (Rule 4.17(ii))

Published:
— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

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DESCRIPTION
STOPPERED DISCHARGE VALVE FOR CISTERN

5 Technical Field

This invention relates to a type of a stoppered discharge system which is designed for toilet reservoir and performs its function with various water volumes.

10 Background Art

Stoppered discharge systems have been used in reservoirs for a long time. There is a need to decrease the amount of water consumed in toilets due to reduced water sources and the methods for fulfilling this need include for example discharge systems with reservoirs of 3-6 liters, toilets which function with less than 6 liters of water or stoppered discharge systems. Therefore user is able to stop the system by intervening water flow after required amount of water is run or enough cleaning is done.

Discharge systems located in reservoir are used in different types for each reservoir trade mark and model. In prior art, in European patent No: EP0892117 an example of stoppered discharge system is illustrated. In this patent, to perform full discharge or discharge in desired amount, elements with magnetic character are used on floating part attached to overflow tube and on the surface in which this part is seated. System of European patent No: EP0892117 which emphasizes on sealing character comprises complex and expensive parts in terms of manufacturing. In European patent No: EP1270831 a reservoir system with double discharge valve is disclosed. In operation, main valve remains opened by the aid of water pressure inside reservoir and second valve controls the amount of water to be added to reservoir by means of at least one floating part. Full discharge and partial discharge could be provided with main valve. The object of European patent No: EP1270831 is to perform operation with less closing noise and with less required force.

In broadly speaking, advantages of stoppered discharge system of the invention used in reservoir are a special formed discharge bearing with double O-ring, a
lantern having fingers hereon which could be attached to discharge bearing and a
discharge bearing support. In virtue of these structural features, utilization, mounting
and maintenance ease could be provided with stoppered discharge placed in
reservoir due to its structure and this could be used as a discharge with long-life.

**Object of the invention**

The object of this invention is to achieve a stoppered discharge system which is
easily mounted on toilet reservoirs, robust, able to operate with various water
volumes and such that a user could discharge any amount of water he/she desired.

**Description of the Drawings**

The system of the invention is illustrated in the appended figures, in which:

Figure 1, is a perspective view of stoppered discharge as it is mounted.

Figure 2, is a cross-sectioned perspective view of stoppered discharge as it is mounted.

Figure 3, is a top perspective view of stoppered discharge as it is mounted.

Figure 4, is a bottom cross-sectioned perspective view of stoppered discharge as it is mounted.

Figure 5 is a perspective view of the discharge bearing.

Figure 6 is a perspective view of the lantern.

Figure 7 is a perspective view of the discharge tube.

Figure 8 is a perspective view of the styrofoam.

Figure 9 is a perspective view of the discharge bearing support.

Figure 10 is a perspective view of the pull arm.

Figure 11 is a perspective view of the styrofoam clip.

Figure 12 is a perspective view of the styrofoam lower plate.

In figures, each part is numbered individually and corresponds to the numbers given below:

Stoppered discharge system (A)

Discharge bearing (1)

Sealing gasket (2)
Lantern (3)
Discharge tube (4)
Pull arm (5)
Discharge bearing support (8)

Styrofoam clip (9)
Styrofoam (10)
Segment (11)
Discharge gasket (12)
Styrofoam lower plate (13)

Pull arm connection part (16)
Styrofoam lower plate sitting surface (30)
Support channel (31)
Finger engagement space (32)
Gasket channel (33)

Discharge channel (34)
Water passage channel (35)
Bearing lock (36)
Front flat region (37)
Cylindrical region (38)

Sitting Surface (39)
Lantern finger (41)
Wall abutment (42)
Lantern upper opening (43)
Lantern upper opening channel (44)

Lantern lower rabbet (45)
Styrofoam lower plate water passage openings (51)
Styrofoam lower plate opening (52)
Discharge tube engagement opening (61)
Styrofoam channel (62)

Finger engagement recess (71)
Discharge tube corrugation (72)
Styrofoam clip abutment rabbet (73)
Styrofoam engagement surface (74)
Segment-gasket sitting surface (75)

Discharge tube styrofoam corrugation (76)
Discharge tube middle portion (77)  
Discharge bearing support finger (81)  
Discharge bearing support arm (82)  
Discharge bearing support lower region (83)  
Discharge bearing support space (84)  
Discharge bearing support upper region (85)  
Pull arm eyelet (91)  
Pull arm jaws (92)  
Pull arm finger (93)  
Pull arm grip (94)  

**Disclosure of Invention**

Stopped discharge system (A) of the invention shown in Figures 1-4 comprises mechanical parts shown as a discharge bearing (1), a sealing gasket (2), a lantern (3), a discharge tube (4), a pull arm (5), a discharge bearing support (8), a styrofoam clip (9), a styrofoam (10), a segment (11), a discharge gasket (12), a styrofoam lower plate (13), a pull arm connection part (16).

Discharge bearing (1) shown in Figure 5 comprises a support channel (31) in a track or channel form in which discharge bearing support (8) engages and a finger engagement space (32) on this channel in which discharge bearing support finger (81) (shown in Figure 9) is attached. Front flat region (37) extends in directly opposite of support channel (31). Front flat region (37) and support channel (31) prevent discharge bearing (1) from rotating in an uncontrolled way by abutting front and back interior surfaces of reservoir. Sealing gaskets (2) are attached into two gasket channels (33) located at cylindrical region (38) on discharge bearing. Discharge bearing (1) is placed into exit channel of reservoir from cylindrical region (38) and is also placed in lower interior surface of reservoir due to rabbeted structure of sitting surface (39) in discharge bearing (1). In stoppered discharge system (A), during discharge, water in reservoir is used by passing from water passage channel (35) into discharge channel (34). The position of lantern (3) is fixed by engaging lantern fingers (41) of lantern (3) shown in Figure 6 into bearing locks (36) at both sides of discharge bearing (1). The task of two sealing gaskets (2) is to prevent any leaking from discharge bearing (1) in reservoir even if all support or
fixing parts of stoppered discharge system (A) are removed. In any deformation or structural change which could be formed in any of sealing gaskets (2) in time, second gasket is provided to keep its sealing function as a safety gasket. Also, styrofoam lower plate (13) is located on styrofoam lower plate sitting surface (30) as shown in Figure 2 and Figure 4.

Lantern (3) shown in Figure 6 has a bottom with an opening and a body having a hollow cylindrical form wherein two wall abutments (42) extending as opposed and in form of an outward protrusion are located near to upper side hereof, a lantern lower rabbet (45) formed by diameter enlargement extends at lower side hereof and two lantern fingers (41) extending as opposed and as an outward protrusion is located on a lantern lower rabbet (45) and a lantern upper opening (43), through which discharge tube (4) is passed, extends at upper side hereof. Lantern upper opening channels (44) facing as opposed, in which discharge tube corrugations (72) of discharge tube (4) shown in Figure 7 are engaged, extend on interior surface of lantern upper opening (43).

Two wall abutments(42) on lantern(3) serve as a support by tightly abutting front and back interior walls of reservoir to prevent collapse or volume constrictions that might be occurred during plastering and tiling especially in built-in reservoirs and outside effects which obstruct or limit the function of stoppered discharge system (A).

Discharge tube (4) shown in Figure 7 has also a hollow cylindrical form wherein its upper and lower surfaces are opened, two finger engagement recesses (71) are located on upper side hereof to attach pull arm finger (93) (shown in Figure 10), segment-gasket sitting surface (75) formed by diameter attenuation at lower side hereof is located where two segments (11) and discharge gasket (12) in between are placed top of each other. Two longitudinal discharge tube corrugations (72) extending as opposed which fit in lantern upper opening channels (44) are located in discharge tube middle portion (77). Two longitudinal discharge tube styrofoam corrugations (76) extending as opposed on styrofoam engagement surface (74) formed by diameter attenuation relative to discharge tube middle portion (77) are located between segment-gasket sitting surface (75) and discharge tube middle portion (77). The rabbet at which discharge tube middle portion (77) finishes and styrofoam engagement surface (74) starts, is styrofoam clip abutment rabbet (73)
where styrofoam clip (9) shown in Figure 11 is fitted. The job of discharge gasket (12) attached on discharge tube (4) is to prevent water leaking from reservoir into toilet by fitting in rabbeted region at the interior surface of discharge bearing (1) (shown in Figure 2 and Figure 4) when discharge process is not performed. Segments (11) attached to upper and lower sides of discharge gasket (12) are used to fix the place of discharge gasket (12) on discharge tube (4).

Styrofoam (10) shown in Figure 8 has a cylindrical structure wherein discharge tube engagement opening (61) is located throughout in the middle, and two longitudinal styrofoam channels (62) extending as opposed, in which discharge tube styrofoam corrugations (76) engage, are located at the interior surface of said opening.

Discharge bearing support (8) shown in Figure 9 has a body in flat elongated plate form and discharge bearing support finger (81) is located at its one end. This body has a discharge bearing support lower region (83) formed in one-piece to the middle extent hereof and subsequently and a discharge bearing support upper region (85) formed in two arms which has a discharge bearing support space (84) as a long gap in the middle hereof. Discharge bearing support arm (82) located at the other end of discharge bearing support (8) is conjoined with discharge bearing support upper region (85). In mounting of stoppered discharge system (A), discharge bearing support (8) is attached to discharge bearing support channel (31) by discharge bearing support finger (81) and to discharge bearing support finger engagement space (32). In mounted state of stoppered discharge system (A), discharge bearing support arm (82) is attached to a fixed point in the system or in reservoir.

Pull arm (5) shown in Figure 10 comprises a pull arm grip (94) in a stick form, a pull arm eyelet (91) at one end of this grip in a circular form and pull arm jaws (92) in a U-shaped form at the other end hereof. Also, two pull arm fingers (93) facing as opposed to each other are located at the ends of pull arm jaws (92) and at the interior side of U-form and these fingers are attached into two finger engagement recesses (71) at upper side of discharge tube (4).

Styrofoam clip (9) shown in Figure 11 is a part attached to styrofoam clip abutment rabbet (73) on discharge tube (4) and is in two nested rings form in which interior ring has an interrupted and elastic structure.
Styrofoam lower plate (13) shown in Figure 12 has a disk shaped structure and styrofoam lower plate water passage openings (51) are located hereon and in the middle hereof is located a styrofoam lower plate opening (52) having two channels in which styrofoam engagement surface (74) placed on discharge tube (4) could be passed. Styrofoam lower plate (13) shown in Figure 2 and figure 4, in mounted state of stoppered discharge system (A), is located on styrofoam lower plate sitting surface (30) over discharge bearing (1) and on the portion of lantern lower rabbet (45) facing the interior portion of lantern (3). The aim of use for styrofoam lower plate (13) is to provide a sitting surface (1) for styrofoam and to provide discharging of water inside the lantern (3) in a controlled way through styrofoam lower plate water passage openings (51) hereon. Amount of water which lifts styrofoam (10) in the lantern (3) and controls discharge time is adjusted by styrofoam plate water passage openings (51).

In stoppered discharge system shown in Figures 1-4, by means of pull arm connection part (16), styrofoam (10) and discharge gasket (12), located in the lantern (3) and fixed to discharge tube (4), are also lifted when pull arm (5) and connected discharge tube are lifted upward. During discharge, as soon as discharge gasket is lifted up, water in the reservoir starts to discharge by passing from water passage channel (35) into discharge channel (34). Discharge tube (4), upon suspending in water, helps discharging of water in the reservoir by means of styrofoam (10). During discharge process, if the user does not intervene, water level drops inside lantern (3) or reservoir and then water could not lift styrofoam (10) therefore discharging process is ended after discharge channel (34) is closed by discharge gasket (12) on the discharge tube (4). However when the user pushes down the pull arm (5) and then connected discharge tube (4) by means of pull arm connection part (16), water flow could be stopped before water level drops upon closing the discharge channel (34) by discharge gasket (12).

Preferred stoppered discharge system (A) above is not intended to limit the protection scope of the invention. In view of the described knowledge by the invention, all modifications on this preferred stoppered discharge system (A) should be interpreted in the protection scope of the invention.
CLAIMS

1. A stoppered discharge system (A) mounted on toilet reservoirs and used for discharging of any amount of water desired by the user, which comprises:
   • a discharge bearing (1) which is fixed to exit channel of reservoir from cylindrical region (38) hereon and to lower interior surface of reservoir from rabbeted sitting surface (39) and has two gasket channels (33) in cylindrical region (38);
   • sealing gaskets (2) which are fixed to said gasket channels (33);
   • a lantern (3) having a body in a hollow cylindrical form in which a discharge tube (4), comprising a styrofoam clip (9), a styrofoam (10), a segment (11), a discharge gasket (12) and a styrofoam lower plate (13), is located;
   • a discharge tube (4) having a hollow cylindrical form wherein its upper and lower surfaces are opened, two finger engagement recesses (71) are located on upper side hereof to attach pull arm finger (93), a segment-gasket sitting surface (75) formed by diameter attenuation at lower side hereof where two segments (11) and discharge gasket (12) in between are placed top of each other;
   • a pull arm connection part (16) attached to pull arm (5);
   • a styrofoam (10) having a cylindrical structure wherein discharge tube engagement opening (61) is located throughout in the middle;
   • a discharge bearing support (8) having a body in flat elongated plate form characterized in that,
      the discharge bearing (1) comprises a support channel (31) in form of a track or channel which abuts to back interior surface of reservoir and in which discharge bearing support (8) engages to prevent discharge bearing (1) from rotating in an uncontrolled way and a front flat region (37) abutting front interior surface of reservoir and extending as directly opposed to support channel (31);
      a bearing locks (36) at both sides of discharge bearing (1) used to fix the position of lantern (3) and to be engaged with lantern fingers (41) belonging to lantern (3);
      a finger engagement space (32) extending on said support channel (31) in which discharge bearing support finger (81) is attached;
a styrofoam lower plate sitting surface (30) extending on said discharge bearing (1) on which styrofoam lower plate (13) is located.

2. A stoppered discharge system (A) according to claim 1 characterized in that, the lantern (3) comprises two wall abutments (42) as outward protrusion extending as opposed near to upper side of said lantern (3) and used as a support by tightly abutting front and back interior walls of reservoir to prevent collapse or volume constrictions, that might be occurred during plastering and tiling especially in built-in reservoirs, and outside effects which obstruct or limit the function of stoppered discharge system (A).

3. A stoppered discharge system (A) according to claim 2 characterized in that, lantern lower rabbet (45) formed by diameter enlargement is located at lower side of lantern (3).

4. A stoppered discharge system (A) according to claim 3 characterized in that, lantern fingers (41) extending as opposed are located on lantern lower plate (45) as outward protrusions.

5. A stoppered discharge system (A) according to claim 1 characterized in that, lantern upper opening channels (44), in which discharge tube corrugations (72) of discharge tube (4) are engaged and facing as opposed to each other, are located at the interior surface of lantern upper opening (43) of lantern (3).

6. A stoppered discharge system (A) according to claim 1 characterized in that, longitudinal discharge tube corrugations (72), which fit in lantern upper opening channels (44) and extending as opposed, are located in discharge tube middle portion (77).

7. A stoppered discharge system (A) according to claim 1 characterized in that, longitudinal discharge tube styrofoam corrugations (76), which are formed by diameter attenuation relative to discharge tube middle portion (77) and extending as opposed on styrofoam engagement surface (74), are located between segment-gasket sitting surface (75) and discharge tube middle portion (77) on discharge tube (4).
8. A stoppered discharge system (A) according to claim 1 characterized in that, styrofoam clip abutment rabbet (73), on which styrofoam clip (9) is fitted, is located on discharge tube (4) where discharge tube middle portion (77) finishes and styrofoam surface (74) starts.

9. A stoppered discharge system (A) according to claim 1 characterized in that, styrofoam (10) comprises longitudinal Styrofoam channels (62), in which discharge tube styrofoam corrugations (76) are engaged and facing as opposed to each other, at the interior surface of discharge tube engagement opening (61).

10. A stoppered discharge system (A) according to claim 1 characterized in that, discharge bearing support (8) comprises a discharge bearing support lower region (83) formed in one-piece to the middle extent hereof and subsequently a discharge bearing support upper region (85) formed in two arms having a discharge bearing support space (84) as a long gap in the middle hereof.

11. A stoppered discharge system (A) according to claim 10 characterized in that, a discharge bearing support (8) comprises a discharge bearing support finger (81), having an elastic structure, at one end hereof.

12. A stoppered discharge system (A) according to claim 10 characterized in that, a discharge bearing support (8) comprises a discharge bearing support arm (82), conjoined with discharge bearing support upper region (85), at other end hereof.

13. A stoppered discharge system (A) according to claims 10-12 characterized in that, in mounted state, discharge bearing support finger (81) is located into discharge bearing support channel (31) and attached to discharge bearing support finger engagement space (32) and at the same time discharge bearing support arm (82) is attached to a fixed point in stoppered discharge system (A) or in reservoir.

14. A stoppered discharge system (A) according to claim 1 characterized in that, pull arm (5) is comprised of a pull arm grip (94) in a stick form, a pull arm eyelet (91) at one end of this grip in a circular form and pull arm jaws (92) at the other end hereof in a U-shaped form and two pull arm fingers (93) are located at the ends of
pull arm jaws (92) and at the interior side of U-form with facing as opposed to each other.

15. A stoppered discharge system (A) according to claim 1 characterized in that, styrofoam lower plate (13) has a disk shaped structure to provide a sitting surface for styrofoam and styrofoam lower plate water passage openings (51) are located hereon to provide discharging of water inside the lantern (3) in a controlled way.

16. A stoppered discharge system (A) according to claim 16 characterized in that, styrofoam lower plate opening (52), having channels in which styrofoam engagement surface (71) at discharge tube (4) could be passed, is located in the middle of styrofoam lower plate (13).

17. A stoppered discharge system (A) according to preceding claims characterized in that, in mounted state, styrofoam lower plate (13) is located on styrofoam lower plate sitting surface (30) over discharge bearing (1) and on the portion of lantern lower rabbet (45) facing the interior portion of lantern (3).
Figure - 7
# INTERNATIONAL SEARCH REPORT

**A. CLASSIFICATION OF SUBJECT MATTER**

E03D1/14

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)

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 practical, search terms used)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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<td>EP 1 270 831 A (GEBERIT TECHNIK AG) 2 January 2003 (2003-01-02) cited in the application page 1, line 20 - line 22; figures 7-10</td>
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<td>A</td>
<td>FR 2 678 300 A (TIRET LUCIEN) 31 December 1992 (1992-12-31) page 1, line 20 - line 22 page 8, line 4 - line 7 page 9, line 8 - line 12</td>
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Further documents are listed in the continuation of Box C.

See patent family annex.

- **A** document defining the general state of the art which is not considered to be of particular relevance
- **E** earlier document but published on or after the international filing date
- **L** document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
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Date of the actual completion of the international search 1 February 2006

Date of mailing of the international search report 13/02/2006

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<td>EP 1270831</td>
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