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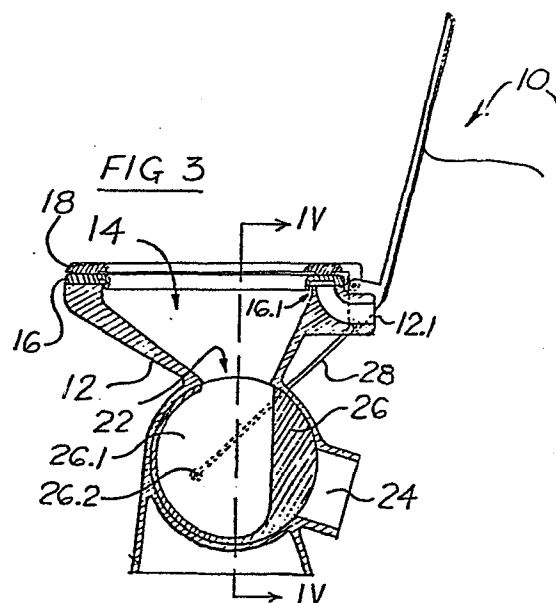
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54 Latrine (111111)+.

57 This invention provides a latrine comprising a latrine body (12) including an inlet (22), an outlet (24), and seal means (26) in the form of a rotor device including a recess (26.1), the rotor being located within the latrine body adapted to place the recess in communication with the inlet and the outlet respectively without permitting direct communication between the inlet and the outlet. In one form of the invention, the rotor device may be rotated by a lever means (28) connected to and activated by the latrine cover (20).

The invention extends to a latrine system including the latrine described above.



LATRINE

This invention relates to a latrine. More particularly, this invention relates to a latrine, or toilet (or water closet) for example of the water-borne type.

It is known to the inventor that with latrines of the
5 reservoir-type, a considerable amount of water, for
example up to 12 or 14 litres, is consumed with every
flushing of this type of toilet. Even with toilets of
the valve-type, a considerable amount of water is con-
sumed with each flushing. Naturally, any saving of
10 water in this regard would be of considerable worth,
especially in any country where water is scarce. It
may be mentioned that this kind of toilet employs a
large diameter water trap or water seal.

Another type of toilet of which the inventor is aware is that type which employs a tiltable spoon at the bottom of the toilet chute, the spoon providing a water seal with the lower end of the chute. This type of toilet utilizes considerably less water than the ordinary flush-type toilet referred to above, but suffers the disadvantage that when the spoon tilts from the horizontal and the water seal is destroyed, offensive smells can issue from the interior of the toilet system.

What is therefore required ideally is a toilet which consumes relatively little water but which nevertheless has a satisfactory seal.

According to the present invention, there is provided a latrine comprising a latrine body including an inlet, an outlet and seal means provided between the inlet and the outlet, the seal means including a recess which is adapted to communicate respectively with the inlet and the outlet whilst preventing communication between the inlet and the outlet.

The seal means may be a rotor device adapted to rotate about an axis perpendicular to a centre line linking the inlet and the outlet in order to permit communication of the recess with the inlet and outlet
5 respectively. Alternatively the seal means may be a slide device adapted to place the recess slidably in communication with the inlet and the outlet respectively.

Also according to the present invention, there is
10 provided a latrine comprising a latrine body including an inlet, an outlet and a rotor device located between the inlet and the outlet and substantially within the latrine body and including a recess, the rotor device being adapted to rotate to permit the recess to commu-
15 nicate with the inlet and the outlet respectively.

The recess mouth may be smaller than the body part located between the inlet and the outlet measured along a centre line linking the inlet and the outlet.

Preferably the recess mouth may be at least as large as
20 the inlet and the outlet respectively.

Preferably water provision means may be provided above the inlet and optionally another water provision means may be provided in or near the outlet.

Movement of the seal means may be coupled by a lever
5 means to a cover on the latrine body such that when the cover is in a closed position the recess is in communication with the outlet whilst when the cover is in an open position the recess is in communication with the inlet. Alternatively the seal means may be moved
10 independently of the latrine cover for example by a lever and handle arrangement.

In one embodiment of the invention the seal means may move sealably relative to and against the latrine body by way of at least one suitable seal ring located on
15 either side of the seal means. In another embodiment , a capillary water seal may be provided between the seal means and the latrine body surrounding the seal means.

Preferably the recess may be shaped such that when in communication with the outlet its and/or angle shape
20 may encourage emptying of contents from the recess.

Further according to the invention, there is provided a latrine system including a latrine as herein described.

In one preferred form of the invention, the seal means may be a rotor device in the form of a receptacle 5 having an opening such that, as the receptacle is rotated, it maintains a seal between the inlet and the outlet i.e. it prevents direct communication between the inlet and the outlet. The receptacle, when its opening is placed in communication with the outlet, has 10 the walls thereof shaped such that contents of the receptacle are completely or effectively discharged.

It will be understood that when the receptacle has its opening communicating with the inlet, the receptacle is in a condition to receive excrement passing through the 15 inlet i.e. both solid and liquid excrement.

In one form of the invention rotation of the receptacle may be coupled by lever means to the latrine cover i.e. when the latrine cover is in its closed position, the receptacle will be placed, by means of the lever 20 means, in communication with the outlet, whilst when

the toilet cover is in a open condition the receptacle opening will be placed in communication with the inlet, whilst when the toilet cover is in an open condition the receptacle opening will be placed in communication
5 with the latrine inlet.

It may be convenient to refer to the receptacle moving from a charging condition i.e. a position wherein the receptacle opening is in communication with the latrine inlet, and to a discharging condition i.e. wherein the
10 receptacle opening is in communication with the latrine outlet.

In another form of the invention, a suitable water rinse or spray may be provided at the upper part of the latrine bowl to either periodically or constantly
15 spray water down the latrine bowl interior whilst a user is using the latrine i.e. when the latrine cover is in a lifted or open condition, thereby to ensure that excrement is rinsed into and reaches the receptacle interior. Optionally a water spray may be
20 provided at or near the outlet to rinse excrement from the receptacle interior to the outlet.

Preferably the receptacle rotates within the body of the latrine with a close rotating fit which prevents egress of odours from the outlet to the inlet. By virtue of the use of water for wetting the latrine bowl
5 interior a (capillary) water seal may be created in the inter space between the receptacle outer surface and the latrine body inner surface wherein the receptacle fits rotatably. In another embodiment, sealing between the receptacle outer surface and the latrine body may
10 be provided by one or more sealing rings, for example O-ring seals.

Preferably the interior surface of both the latrine bowl and the receptacle are made of a suitably smooth material, and for this purpose, both the latrine bowl
15 and the receptacle or its interior may be made of or coated with a suitable plastics or other suitable material.

The invention will now be described in greater detail, by way of example, with reference to the following

drawings, in which:-

Figure 1 shows a schematic side view of one form of the latrine according to the invention;

Figure 2 shows a schematic side sectional view of the
5 toilet of Figure 1 (with its seal means in communication with the latrine outlet);

Figure 3 shows a schematic side sectional view of the toilet of Figure 1 with its seal means in communication with the latrine inlet; and

10 Figure 4 shows a schematic front sectional view of the latrine of Figure 3, along section line IV-IV.

In the drawings, like reference numerals refer to like parts, unless otherwise indicated.

Referring to the drawings, reference numeral 10 refers
15 generally to a latrine according to one form of the invention. The latrine 10 comprises a body, as shown, made of a suitable plastics material such as a suitable polyvinyl chloride or polypropylene, including a bowl 12 having an opening 14 at its upper end.

20 A plastics water provision and distribution ring 16 is provided about the opening 14 and on top of the rim of the bowl

12. A latrine seat 18 is provided on the ring 16 having a conventional (pivotal) seat 18 thereon and a pivotal latrine cover 20 provided on top of the seat 18.

5 The latrine has an inlet 22 within the bowl 12 and an outlet 24, for the passing of solid and liquid excrement into and out of the latrine 10, respectively.

A seal means in the form of a rotor device or receptacle 26 is provided between the inlet 22 and the
10 outlet 24, and which is circular in cross section as seen in figures 1, 2 and 3.

The receptacle 26 is in the form of a short (length) bar of a suitable plastics material which has been hollowed out or provided with a recess 26.1 having one
15 straight side wall, a rounded bottom, and one rounded side, as shown in figures 1, 2 and 3.

In figure 3, the receptacle 16 is shown in its charging position, whilst in figures 1 and 2 the receptacle 26 is shown in its discharging position i.e. in figure 3

the receptacle 26 is in a position ready to receive excrement in the recess 26.1 whilst in figures 1 and 2 the receptacle 26 is in a position to discharge excrement from the recess 26.1 to and through the outlet 5 24.

It will be seen that the receptacle 26 fits into the body of the latrine with a (close) rotating (or sliding) fit. The receptacle 26 is assembled or loaded into the body of the latrine from one side thereof 10 which has a removable cover plate 12.2 and which can be replaced after insertion of the receptacle 26.

Through a arcuate slot in the abovementioned cover plate, a lever means or mechanism is connected pivotally from a pin 26.2 on one side of the 15 receptacle 26 to a lever 28 (shown only partly in Figure 4) pivotally connected to the rear of the cover 18 (as shown), which is adapted to rotate the receptacle 26 from its charging position to its discharging position when the cover 20 is pivotted from 20 its open position (-see Figure 3) to its closed position (-see Figures 1 and 2) and vice versa.

A water flush system is provided in the opening 14 of the bowl 12, in the form of the ring 16 which comprises a water distribution channel 16.1 which is connected to a water passage 12.1 moulded into the rear upper side
5 of the bowl 12, to flush water down the inside walls of the bowl 12 into the recess 26.1.

In use, the latrine 10 may function in several different ways, but one preferred manner is set out hereunder as it relates to the latrine shown in the
10 drawings.

Whilst the cover 20 is in its closed position, the lever mechanism ensures that the receptacle 26 is in its discharging condition namely having its recess 26.1 in communication with the outlet 24. See
15 Figures 1 and 2.

When the cover 20 is lifted to its open condition, the lever 28 ensures rotation of the receptacle 26 from its discharging condition to its charging condition (as shown in figure 3). Simultaneously, when the cover 20
20 is moved to its open condition, the water flush system

is activated for a short period by any suitable means (not shown) thereby permitting water to flush down the inside walls of the bowl 12 ensuring that the side walls are wetted and that a small quantity of water is
5 provided in the recess 26.1. This also ensures that the inter space between the outer surface of the receptacle 26 and the corresponding inner surfaces of the bowl 12 surrounding the receptacle 26 fills with water thereby providing a capillary seal between the inlet 22
10 and the outlet 24.

It will be seen that in both its charging as well as its discharging condition, the receptacle 26 shuts off or seals the outlet 24 from the inlet 22. It will further be seen that the dimensions of the mouth of the
15 recess 26.1 are such that when the receptacle 26 is in any position between its charging and discharging conditions, there will at no time be communication between the inlet 22 and the outlet 24 of the latrine 10. Such relative dimensions i.e. between the mouth of the
20 recess 26.1 of the receptacle 26 and the extent of the surface of the bowl 12 past which the mouth of the recess 26.1 passes between its charging and its

discharging conditions are such that no communication between the inlet 22 and outlet 24 is possible. This effectively prevents egress of odours from the outlet 24 to the inlet 22.

5 The latrine 10 is then used in the normal way so that any excrement gravitates or is otherwise assisted by reason of the wetting of the inside walls with water, toward to the receptacle 26, and more particularly toward the bottom of the recess 26.1 . When use of
10 the latrine 10 has been completed, a user will then merely move the cover 20 from its open condition to its closed condition. As will appear clearly from the drawings such closing of the cover 20 will by means of the lever 28 move the receptacle 26 from its charging
15 to its discharging condition which will ensure discharging of substantially all excrement from the recess 26.1 of the receptacle 26 into and through the outlet 24, together with any water that has flowed into the receptacle 26 from the channel 16.1. When the cover
20 20 is again opened, the aforementioned cycle is repeated.

Flushing of water from the channel 16.1 may continue for a short period only or may be intermittent.

Rotation of the receptacle 26 may of course in an alternative embodiment of the invention, take place by
5 means of any suitable system of levers activated for example by a lever or button mounted on the floor or otherwise on the side of the latrine 10, or in any other convenient place or manner (for example independently of operation of the cover 20).

10 It will be understood that both the latrine body 12 and the receptacle 26 may be made from any suitable material, or may be coated both on their interior and exterior, with any suitable material. The working
surfaces of the bowl 12 and the receptacle 26 may be
15 made from or coated with a suitable plastics material which is smooth and discourages adhesion of excrement thereto.

As indicated in the drawings, it is preferred that the mouth of the recess 26.1 is larger than the dimensions
20 of the inlet 22 and the outlet 24, in order to prevent undesirable retention of excrement about the mouth of the recess 26.1.

In another embodiment one or more O-rings or any other suitable seals (not shown) may be provided between the receptacle 26 and the surrounding part of the body 12 of the latrine 10, for example on the outside of the 5 (blind) ends of the receptacle 26 i.e. on the outside of the blind ends and on the inside of the body 12. Any other seals may be provided, if required and if desired, at any other location(s) on the outside of the receptacle 26 which, it will be noticed functions 10 essentially like a rotor.

It may be mentioned that the invention extends to a rotor device or receptacle which moves to a discharging condition for example at a side-on location (not shown) instead of in a front-rear manner as shown in the 15 drawings.

Whilst it has been mentioned previously that the water flush system is activated when the cover 20 is lifted, it is possible for the flush system to be activated when downward force is applied to the seat cover 18 for 20 example when a person sits on the seat cover 18. Any other suitable activation means for the water system

can of course be employed, for example a separate (unconnected) switch, button or lever which activates the water system independently of the seat 18 or the cover 20.

5 A further variation which may be applied to the latrine, and more particularly to the recess 26.1, is that a relatively high pressure, i.e. mains water pressure, spray may be provided either in that part of the body of the bowl 12 past which the mouth of the
10 recess 26.1 moves between its charging and discharging conditions, or alternatively it may be placed in the upper part or outside of the outlet 24 so that a small quantity of water is sprayed into the recess 26.1 either as the receptacle 26 moves towards the
15 discharging condition or whilst it is in its discharging condition, in order to flush, rinse out or otherwise clean the recess 26.1.

It will be appreciated that only a small quantity of water is consumed by the latrine, as described above,
20 for example approximately 2 litres per operation of the latrine or, in favourable circumstances approximately between 1 and 2 litres.

Although not shown in the drawings, the seal means may be provided between the inlet and the outlet in the form of a slide device including a recess therein, or any other equivalent device.

- 5 This invention extends, as mentioned above, to a latrine system, and for this purpose a latrine as shown in the drawings, or as otherwise described herein, may be coupled for example to a septic tank which may preferably function anaerobically since the seal of
- 10 this type of latrine effectively excludes ingress of air into the septic tank. Naturally the latrine can be coupled to any suitable sewage means or system, for example a french drain or a normal water-borne sewage system.
- 15 Although certain embodiments only of the invention have been described herein, it will be apparent to any person skilled in the art that several variations and/or modifications of the invention are possible. Such variations and/or modifications are to be under-
- 20 stood as falling within the spirit and scope of the invention as defined in the appended claims.

CLAIMS:

1. A latrine comprising a latrine body including an inlet, an outlet and seal means provided between the inlet and the outlet, the seal means including a recess which is adapted to communicate
5 respectively with the inlet and the outlet whilst preventing communication between the inlet and the outlet.
2. A latrine as claimed in claim 1, wherein the seal
10 means is a rotor device adapted to rotate about an axis perpendicular to a centre line linking the inlet and the outlet in order to permit communication of the recess with the inlet and the outlet respectively.
3. A latrine comprising a latrine body including an
15 inlet, an outlet and a rotor device located substantially within the latrine body and including a recess, the rotor device being adapted to rotate to permit the recess to communicate with the inlet and the outlet respectively.

4. A latrine as claimed in any one of the preceding claims, wherein the recess mouth is smaller than the body part located between the inlet and the outlet measured along a centre line linking the inlet and the outlet.
5. A latrine as claimed in any one of the preceding claims, wherein the recess mouth is at least as large as the inlet and the outlet respectively.
6. A latrine as claimed in any one of the preceding claims, wherein the latrine body and /or the seal means is made of or coated with a plastics material providing suitably smooth working surfaces.
7. A latrine as claimed in any one of the preceding claims, wherein water provision means is provided above the inlet and optionally another water provision means is provided in or near the outlet.
8. A latrine as claimed in any one of the preceding claims, wherein movement of the seal means is

coupled by a lever means to a cover on the latrine body such that when the cover is in a closed position the recess is in communication with the outlet whilst when the cover is in an open position the recess is in communication with the inlet.

9. A latrine as claimed in any one of the preceding claims, wherein the seal means moves sealably relative to and against the latrine body by way of at least one suitable seal ring located on either side of the seal means.

10. A latrine as claimed in any one of claims 1 to 8, wherein a capillary water seal is provided between the seal means and the latrine body surrounding the seal means.

11. A latrine as claimed in any one of the preceding claims, wherein the recess is shaped and/or angled so that when in communication with the outlet its shape and/or angle encourages emptying of contents from the recess.

12. A latrine system including a latrine as claimed in any one of the preceding claims.

