

Toilet

The invention relates to a toilet; in particular, to a toilet whose contents are contained during a flushing operation

As is well known, toilets are used for the disposal of waste matter, usually, though not exclusively, human waste matter such as, for example, faeces. A toilet typically comprises a bowl having an opening and an outlet which is connected by a pipe to a drain. Anything for disposal is deposited into the bowl. On a flushing operation, water, supplied to the bowl, flushes the contents of the bowl out through the outlet. Typically, but not necessarily, the water is supplied from a cistern co-located with the bowl and provided with a valve mechanism. A user initiates a flushing operation by actuating the mechanism, which results in the water held in the cistern being emptied into the bowl.

A problem with known toilets is that the flushing operation creates water droplets that are propelled upwards and exit the bowl through the opening. These droplets may carry with them particles of waste matter, bacteria and other potentially harmful products from the bowl. The droplets may hang in the air or may be deposited on nearby surfaces, which compromises the hygiene of the surrounding environment. Studies have shown that it is possible to culture the E. Coli bacteria (used to prove faecal contamination) from the ceilings of rooms in which toilets are situated.

A toilet may be provided with a seat, which sits on the opening, and/or a lid, which covers the opening. However, water droplets may escape through any gap between the seat and/or lid or the droplets may be deposited on the seat and/or lid, which also presents a hygiene problem.

According to a first aspect, the invention provides a toilet comprising a bowl having an opening, surrounded by a rim, and an outlet; flushing means, wherein a flushing operation of the flushing means causes a quantity of water to be supplied to the bowl, which water flushes anything deposited in the bowl out through the outlet; a sheet material holder

holding sheet material; and attachment means attaching the holder to the bowl; wherein the holder is adapted to dispense a piece of sheet material for placing over the opening, in contact with the rim, without leaving any gaps, thereby to contain the contents of the bowl during a flushing operation. The piece of material acts as a cover for the opening. The contents of the bowl include water droplets. Because there are no gaps between the piece of paper and the rim, any water droplets propelled upwards are unable to exit the bowl through the opening.

Preferably the sheet material is disposable. Further preferably, the sheet material is toilet disposable, that is to say, suitable, physically at least, for disposal in the toilet. Additionally preferably, the sheet material is biodegradable. Practically and economically there are a number of sheet materials that meet these requirements, but paper is ideal. Preferably, the paper is sufficiently stiff to prevent a piece from collapsing into the bowl when placed over the opening.

Preferably, the sheet material is in continuous ribbon form, that is to say, comprising a plurality of pieces of sheet material joined in a continuous ribbon. Further preferably, the sheet material is perforated to aid tearing into pieces. The sheet material may be wound into a roll. As an alternative, the sheet material may be in pack form comprising a pack of pieces of sheet material.

The sheet material may be anti-bacterial, in other words, impregnated, coated or in some way treated with a product that kills or minimises bacteria. The sheet material may be perfumed as is common with toilet products.

The holder further preferably comprises tearing means for aiding tearing of the sheet material. The holder may comprise a multi-sided channel and an edge of one of the sides of the channel may serve as the tearing means. The holder may be made from plastics material or any other suitable material or materials.

The attachment means preferably comprises a releasable attachment mechanism for releasably attaching the holder to the bowl, facilitating the removal of the holder from the bowl for, for instance, cleaning the bowl. The releasable attachment mechanism may comprise at least one suction device. The attachment means also preferably comprises moving means for moving the holder between a deployed position, to one side of the bowl, opposite the opening, and a stowed position, not, or only partly, opposite the opening. The attachment means may comprise a member and the moving means may comprise a sliding mechanism which enables the holder to slide relative to the member whilst attached.

The toilet may further comprise a seat pivotably attached to the bowl, which seat is movable between an out-of-use position and an in-use position wherein the seat holds the piece of sheet material in place, against the rim. The toilet may also further comprise a lid movably attached to the bowl, which lid is movable between a stowed position and a deployed position wherein the lid sits on the seat. Alternatively, the toilet may comprise only a lid pivotably attached to the bowl, which lid is movable between a stowed position and a deployed position wherein the lid holds the piece of sheet material in place, against the rim.

The flushing means may comprise a cistern for holding water, having a valve mechanism, in which case a flushing operation involves actuation of the valve mechanism whereupon water is supplied from the cistern to the bowl. There are many other ways in which water may be supplied to the bowl, such as directly from a mains water supply.

According to a second aspect, the invention provides a holder and attachment means for use with a toilet according to a first aspect of the invention.

According to a third aspect, the invention provides sheet material for use with a toilet according to a first aspect of the invention.

According to a fourth aspect, the invention provides a method of operating a toilet comprising a bowl having an opening, surrounded by a rim, and an outlet; the method comprising placing a piece of sheet material over the opening, in contact with the rim,

without leaving any gaps, thereby to contain the contents of the bowl during a flushing operation; and initiating a flushing operation by supplying a quantity of water to the bowl; which water flushes anything deposited in the bowl out through the outlet.

The invention will now be described with reference to the drawings in which:

Figure 1 is a top view of a toilet according to the invention;

Figure 2 is a top view of a toilet according to the invention showing a piece of sheet material in place over the opening in the bowl prior to tearing;

Figure 3 is a front view of a toilet according to the invention; and

Figure 4 is a partial front view of a toilet according to the invention showing the sheet material holder in transverse cross section.

With reference to figure 1, a toilet indicated generally at 1 comprises a bowl 2 and a cistern 12. The bowl 2 is adapted to sit on a floor 20. The cistern 12 is located between the back of the bowl 2 and a wall 18. The front of the bowl 2 is generally rounded. At its top, the bowl 2 has an opening 6; at its bottom, it has an outlet 8. The opening 6 is surrounded by a rim 4. A seat 10 is pivotably mounted to the bowl 2, adjacent its back. The seat 10 is provided with feet, two of which, 40a and 40b, are visible in figure 1. The seat 10 is movable between an in-use, down position, in which the feet 40a 40b sit on the rim 4, and a out-of-use position, in which it is up, out of the way.

Waste matter for disposal is deposited into the bowl 2 through the opening 6. The outlet 8 is connected by a pipe (not shown) to a drain (not shown). The cistern 12 holds a quantity of water and has a valve mechanism (not shown) including a valve (not shown) and an actuator (not shown). A user initiates a flushing operation by actuating the actuator which causes water from the cistern 12 to be emptied into the bowl 2. Ducts (not shown), that terminate under the rim 4, supply the water from the cistern 12 to the bowl 2. The water flushes

anything deposited in the bowl 2 out through the outlet 8, towards the drain. On completion of the flushing operation, the valve automatically closes and the cistern 12 is refilled with water ready for the next flushing operation.

With further reference to figures 3 and 4, an elongate, plastics material sheet material holder 14 is mounted on one side of the bowl 2. A plastics material mounting member 16 is releasably attached to the side of the bowl 2 by four rubber suction devices 28a, 28b, 28c and 28d. The holder 14 is slidably held to the mounting member 16 by a push-fit dovetail joint arrangement 24 that enables the holder 14 to slide in a longitudinal direction relative to the member 16.

The holder 14 is shown in figure 1 in a deployed position in which it has been slid towards the front of the bowl 2, opposite the opening 6. The holder 14 is movable to a stowed position (not shown), towards the back of the bowl 2, in which the holder 14 is not opposite, or only partly opposite, the opening 6.

The holder 14 comprises a three-sided channel 32. A fourth side or lid 34 (shown in the open position) is pivotably attached to the one of the three sides of the channel 32 that is furthest away from the bowl 2. With the lid 34 closed, the holder 14 is generally square in transverse cross section. The holder 14 is longer than the front-to-back dimension of the opening 6. The holder 14 holds a roll 30 of paper which sits in the channel 32. The roll 30 is as wide as the holder 14 is long. In other words, the roll 30 is wider than the front to back dimension of the opening 6. The roll 30 is accessible to a user by opening the lid 34.

When the seat 10 is down, there is a gap between the rim 4 and the lid 10 because the feet 40a, 40b keep the seat 10 spaced apart from the rim 4.

With further reference to figure 2, as the roll 30 is freely rotatable within the holder 14, the paper 36 is dispensed by the user pulling the free end 26 of the roll 30 so as to cause it to unwind. With the holder 14 in the deployed position, the user pulls the paper across the opening 6. The user continues to pull the paper until he or she has unrolled a length greater

than the side-to-side dimension of the opening 6. The user then tears the paper from the roll 30. The paper has width-wise perforations 42 to aid tearing, and the extended edge of the side 38 of the holder 14 nearest the bowl 2 acts as a blade, also to aid tearing. The user next places the torn piece 36, which is bigger than the opening 6, over the opening 6, in contact with the rim 4, without leaving any gaps. The weight of the piece 36 is sufficient to hold it in place over the opening 6, against the rim 4, but putting the lid 10 down assists in holding it in place. The feet 40a, 40b press the piece 36 against the rim 4. The user then initiates a flushing operation.

The piece of paper 36 contains the contents of the bowl 2 during the flushing operation. The contents include any water droplets created during the flushing operation. Because there are no gaps between the piece of paper 36 and the rim 4, any of the water droplets propelled upwards are unable to exit the bowl 2, through the opening 6.

When the flushing operation is complete, the user deposits the piece of paper 36 into the bowl for disposal at the next flushing operation.

Claims

1. A toilet comprising a bowl having an opening, surrounded by a rim, and an outlet; flushing means, wherein a flushing operation of the flushing means causes a quantity of water to be supplied to the bowl, which water flushes anything deposited in the bowl out through the outlet; a sheet material holder holding sheet material; and attachment means attaching the holder to the bowl; wherein the holder is adapted to dispense a piece of sheet material for placing over the opening, in contact with the rim, without leaving any gaps, thereby to contain the contents of the bowl during a flushing operation.
2. A toilet according to claim 1 wherein the sheet material is disposable.
3. A toilet according to claim 2 wherein the sheet material is toilet disposable.
4. A toilet according to claim 3 wherein the sheet material is paper.
5. A toilet according to any of claim 1 to 4 wherein the sheet material is in continuous ribbon form.
6. A toilet according to claim 5 wherein the sheet material is perforated.
7. A toilet according to claim 5 or claim 6 wherein the sheet material is wound into a roll.
8. A toilet according to any of claims 1 to 4 wherein the sheet material is in pack form comprising a pack of pieces of sheet material.
9. A toilet according to any preceding claim wherein the sheet material is anti-bacterial.
10. A toilet according to any preceding claim wherein the sheet material is perfumed.

11. A toilet according to any preceding claim wherein the holder comprises tearing means for aiding tearing of the sheet material.

12. A toilet according to claim 11 wherein the holder comprises a multi-sided channel and wherein an edge of one of the sides of the channel serves as the tearing means.

13. A toilet according to any preceding claim wherein the attachment means comprises a releasable attachment mechanism for releasably attaching the holder to the bowl.

14. A toilet according to claim 13 wherein the releasable attachment mechanism comprises at least one suction device.

15. A toilet according to any preceding claim wherein the attachment means comprises moving means for moving the holder between a deployed position, to one side of the bowl, opposite the opening, and a stowed position, not, or only partly, opposite the opening.

16. A toilet according to claim 15 wherein the attachment means comprises a member and the moving means comprises a sliding mechanism enabling the holder to slide relative to the member whilst attached.

17. A toilet according to any preceding claim further comprising a seat pivotably attached to the bowl, which seat is movable between an out-of-use position and an in-use position wherein the seat holds the piece of sheet material in place, against the rim.

18. A toilet according to claim 17 further comprising a lid movably attached to the bowl, which lid is movable between a stowed position and a deployed position wherein the lid sits on the seat.

19. A toilet according to any of claims 1 to 16 further comprising a lid pivotably attached to the bowl, which lid is movable between a stowed position and a deployed position wherein the lid holds the piece of sheet material in place, against the rim.

20. A toilet according to any preceding claim wherein the flushing means comprises a cistern for holding water, having a valve mechanism, and a flushing operation involves actuation of the valve mechanism whereupon water is supplied from the cistern to the bowl.

21. A holder and attachment means for use with a toilet according to any preceding claim.

22. Sheet material for use with a toilet according to any preceding claim.

23. A method of operating a toilet comprising a bowl having an opening, surrounded by a rim, and an outlet; the method comprising placing a piece of sheet material over the opening, in contact with the rim, without leaving any gaps, thereby to contain the contents of the bowl during a flushing operation; and initiating a flushing operation by supplying a quantity of water to the bowl; which water flushes anything deposited in the bowl out through the outlet.