(12) PATENT
(19) AUSTRALIAN PATENT OFFICE

(11) Application No. AU 200079135 B2
(10) Patent No. 780193

(54) Title
Method and device for separating and disposing of faeces and urine in urine separation toilets

(51)6 International Patent Classification(s)
E03D 011/02

(21) Application No: 200079135

(22) Application Date: 2000.10.04

(87) WIPO No: WO01/25555

(30) Priority Data

(31) Number	(32) Date	(33) Country
19947648	1999.10.04	DE
19948322	1999.10.07	DE

(43) Publication Date : 2001.05.10
(43) Publication Journal Date : 2001.07.05
(44) Accepted Journal Date : 2005.03.10

(71) Applicant(s)
Ulrich Braun

(72) Inventor(s)
Ulrich Braun

(74) Agent/Attorney
Davies Collison Cave,Level 15,1 Nicholson Street,MELBOURNE VIC 3000

(56) Related Art
EP 507689
EP 591558
EP 206312

79135/00

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro

(43) Internationales Veröffentlichungsdatum
12. April 2001 (12.04.2001)

PCT

(10) Internationale Veröffentlichungsnummer
WO 01/25555 A1

(51) Internationale Patentklassifikation⁷: E03D 11/02

(21) Internationales Aktenzeichen: PCT/EP00/09700

(22) Internationales Anmeldedatum:
4. Oktober 2000 (04.10.2000)

(25) Einreichungssprache: Deutsch

(26) Veröffentlichungssprache: Deutsch

(30) Angaben zur Priorität:
199 47 648.9 4. Oktober 1999 (04.10.1999) DE
199 48 322.1 7. Oktober 1999 (07.10.1999) DE

(71) Anmelder und
(72) Erfinder: BRAUN, Ulrich [DE/DE]; Guntramstrasse 34, 79106 Freiburg (DE).

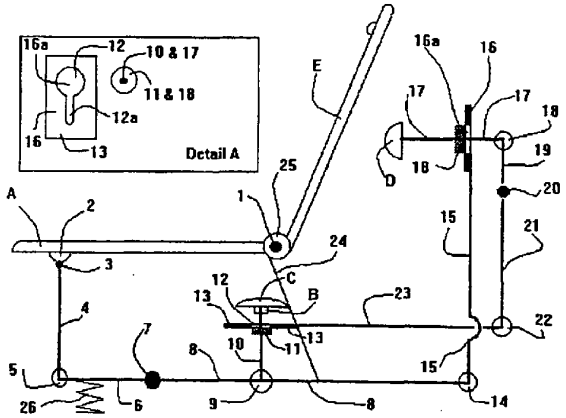
(81) Bestimmungsstaaten *(national)*: AE, AL, AM, AT, AT (Gebrauchsmuster), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DE (Gebrauchsmuster), DK, DK (Gebrauchsmuster), DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Bestimmungsstaaten *(regional)*: ARIPO-Patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), eurasisches Patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Fortsetzung auf der nächsten Seite]

(54) Title: METHOD AND DEVICE FOR SEPARATING AND DISPOSING OF FAECES AND URINE IN URINE SEPARATION TOILETS

(54) Bezeichnung: VERFAHREN UND VORRICHTUNG ZUM GETRENNTEN ERFASSEN UND ABLEITEN VON FÄKALIEN UND URIN IN URINSEPARATIONSTOILETTEN



(57) Abstract: The invention relates to a urine separation toilet. Said toilet can be constructed without a partition between the urine and faecal outlets in such a way that the whole bowl can be cleaned during the flush operation and that the toilet paper in the urine outlet area, together with yellow deposits can be transported to the faecal outlet area. The toilet can nevertheless maintain a water-free disposal of urine.

[Fortsetzung auf der nächsten Seite]

WO 01/25555 A1

The present invention relates to a urine separation toilet. The toilet can be constructed without a partition wall between the urine and faecal outlets in such a way, that the whole bowl can be cleaned during flush operation and that the toilet paper in the urine outlet area, together with yellow deposits can be transported to the faecal outlet area. The toilet can nevertheless maintain a water-free disposal of urine.

State-of-the-art urine separating toilets are equipped with a partition wall between the front urine outlet and the back faecal outlet area, thus dividing the toilet bowl into two hydraulically unconnected partial-bowls, related to the two levels of the outlets.

If urine is diluted with water, urinary calculus precipitates, clogging the urine drainage pipes in the long run. Thus, the urine outlet has to be designed water-free. Consequently, state-of-the-art technology is limited to only flushing the back partial-bowl, because the front partial-bowl is not flushed.

Accordingly, the disadvantage of the state-of-art technology is that the front urine outlet area cannot be flushed, and thus the toilet paper, being disposed of in the front urine outlet mainly during women's urination, cannot be transported to the faecal outlet by means of flushing. It has to be transported manually, quite usually with the help of the toilet-brush, into the back faecal outlet area.

One other disadvantage of the state-of-art technology is that due to the water-less urine outlet, splashes of the urine dry-off upon the bowl-walls of the front urine outlet, thereby causing a yellow layer to develop in the course of time.

One other disadvantage of the state-of-art technology is that the urine outlet is open, whereat a strong ammoniac odour develops especially in case of long time non-usage, which is caused by the activity by the bacterial enzyme urease settling in the urine outlet.

A French patent application proposes to equip the urine outlet with a close-able seal, whereat the urine outlet seal is opened during seating by a pressure sensor, which is coupled to the toilet seat. But this urine outlet is not water-free because during flushing, flushing-water always remains in the front bowl, which drains through the urine outlet during the next usage. Furtermore, the partition wall is equipped with a small hole through which excess flushing-water can run-off from the front urine outlet area into the faecal outlet area. Although the dilution of urine is little, it is sufficient for urinary calculus precipitation. As a result of this knowledge, the mechanics of a close-able urine outlet, which is coupled through a pressure sensor with the toilet seat, is presently known.

In accordance with one aspect of the present invention, there is provided a urine separating toilet for the separate collection and drainage of urine and faeces comprising a urine outlet, a faecal outlet, a toilet bowl and a toilet seat, said toilet further comprising:

a) a device for opening the urine outlet if a user sits down on the toilet or sits down on the toilet seat or tips the toilet seat backward;

b) a device for closing the urine outlet if the user rises and/or tips the toilet seat downward; and

c) a device for flushing the entire toilet bowl whereby solids such as toilet paper can be transported with the flushing water from the area of the urine outlet to the area of the faecal outlet.

In accordance with a further aspect of the present invention, there is provided a method for operating a urine separating toilet having a urine outlet, a faecal outlet, a toilet bowl and a toilet seat, said method comprising the steps of:

a) opening the urine outlet if a user sits down upon the toilet or sits down on

the toilet seat or tips the toilet seat backward;

b) closing the urine outlet if the user rises and/or tips the toilet seat downward; and

c) flushing the entire toilet bowl whereby solids such as toilet paper are transported with the flushing water from the area of the urine outlet into the area of the faecal outlet.

Very preferably, the urine separating toilet comprises

(1) a close-able urine outlet with a connected drainage pipe and/or siphon, whereat the siphon can be equipped with an odour retaining light liquid, and/or

(2) one or more concievable and/or actualy on the market available mechanical and/or physical and/or chemical sensors, and/or

(3) a designed V-shaped toilet bowl in the cross-section which can collect the urine in front of the urine outlet more concentrated. The cross-section preferably shows bulging protrusions, which guide the urine effectively to the urine outlet.

The advantage of this method is the simple control of the toilet by means of the employment of sensors. In an especially preferred embodiment, the very workings of the human excretory process are employed in the control of the water-free urine outlet. In a especially preferred embodiment, this control method comprises the following steps:

(a) A preferred embodiment comprises sensors, especially preferably pressure sensors, which cause direct and/or indirect reactions as soon as a person sits down on a toilet.

(b) In another especially preferred embodiment, the reactions produce an opening in the urine outlet.

(c) In another especially preferred embodiment, the reactions caused produce a closure, or a blocking of the push-button of the device for flushing the toilet bowl, or other suitable measures, to prevent a flushing process in the toilet bowl.

(d) In another especially preferred embodiment, the said sensors cause preferably direct and/or indirect reactions as soon as a person rises from the toilet.

(e) In another especially preferred embodiment, the reactions produce a closure of the urine outlet.

(f) In another especially preferred embodiment, the reactions produce an opening, or a release of the push-button of the device for flushing the toilet bowl, or other suitable measures, to reverse the reactions.

The said pressure sensors in (a) are preferably simple, mechanical gearing constructions. The following explains the control by means of pressure sensors and simple mechanical gearing constructions. But these gearing constructions can be suplemented or even replaced by other kinds of constructions, such as gas- or liquid- hydraulic, electric, electronical, etc.

In a state of rest, the urine outlet is closed tight, and the flushing push-button is activatable. It's activation leads to a flushing of the toilet.

Through weight (through taking a seat), the toilet seat is pressed down a small distance, and this distance leads to a lifting (opening) of the urine outlet seal via a gearing construction.

By releasing (through rising) the toilet seat, one or more devices for generating a counter-pressure against the weight-pressure, preferably a metal compression spring, press the seat and the urine outlet seal back to the state of rest.

Moreover, the device(s) for generating the counter-pressure should close the urine outlet tightly, and should move the gearing construction preferably only after a certain threshold weight is applied This threshold value should of course be very preferably lower of a sitting child.

The activation of the mechanical gearing construction should at the same time lead to a decoupling of the toilet-flushing mechanism, preferably here as well via a simple mechanical gearing construction.

For these mechanical constructions, all currently known methods and devices are usable.

The activation of the toilet flush-button can preferably suspend the functioning of the urine outlet, until the flushing procedure is completed. By this means, the entrance of the flushing water into the urine outlet during sitting and pushing the flush-button is prevented. Here as well, all currently known methods and devices known to the experts are usable for these mechanical constructions.

In the past decades, the behaviour of the male urinating clientele has changed slowly at the instigation of the female toilet users. A certain percentage of the male users has started to tip up the toilet seat ahead of excreting urine in the erect standing position. In another especially preferred embodiment, the here presented method takes advantage of this male behaviour concession. The tipping up of the toilet seat causes an opening of the urine outlet with a simultaneous blocking of the flushing device. By means of this, it is ensured, that at least a part of the urine of masculine standing urinaters retrieved at the urine outlet. The tipping down of the toilet seat then causes the closure of the urine outlet and the release of the flushing device.

The faecal outlet can be designed for all possible embodiments, such as suction devices etc. For the operation of the flushing device, one or more push-buttons can be provided for, allocating different water amounts for the flushing procedure.

In a further especially preferred embodiment, said sensors in (a) can be utilized identifying and/or distinguishing substances which may be put into the toilet, such as urine, faeces, toilet paper etc. The reactions then caused by the sensors can regulate the water consumption of the toilet.

In a further especially preferred embodiment, the toilet bowls of said embodiments can be equipped with a dirt-, or water-rejecting surface (e.g. nano surfaces), preferably according to the "lotus-leaf principle".

Embodiments of the present invention will now be described, by way of non-limiting example only, with reference to the accompanying drawings, in which:

Figure 1 shows a cross-section A – B through the toilet in a preferred embodiment of the urine separating toilet according to the present invention. The mechanism is preferably located in the hatched part of the figure, which opens the urine outlet and decouples the toilet flushing mechanism during seating, and re-establishes the state of rest during release. (1) shows a cross-section through the faecal siphon. (6) shows the urine outlet with siphon. Sections 1 – 4 show the cross-sections of figure 2.

Figure 2 shows the cross-sections of a preferred embodiment of the urine separating toilet according to the present invention.

Section 1 shows a section through the upper part of the urine separating toilet. Cutting edge A – B shows the cut of figure 1. (2) symbolizes the urine outlet, and (3) the faecal outlet.

Section 2 shows bulging protrusions (3) and (4) of the lateral walls of the urine separating toilet, serving to guide the urine into the urine outlet.

Section 3 shows even greater bulging protrusions.

Section 4 shows the protrusions shortly just in front of the urine outlet, which is located deeper. Located deeper than the urine outlet is the flow-off edge of the faecal outlet.

Figure 3 shows a possible mechanical control in a preferred embodiment of the urine separating toilet according to the invention. Black circles symbolise axles, white circles symbolise joints. (E) symbolises the tipped up toilet seat covering the flush-button (D).

The weight on the toilet seat

Weighting the toilet seat (A), it presses via pressure-head (2) on sensor (3). This in turn presses bar (4) to the joint (5) down.

Therefore, the stiff bar (6) – (8), which revolves mounted on an axle (7), is pressed down at the end (6), and thus the end (8) is pressed up.

This forces bars (10) and (15), being mounted along with joints (9) and (14) to bar (8), to rise upward.

This causes a lifting of the urine outlet seal (B) inclusive of cover (C). Thereby, the urine outlet is open. At the same time, blocking-plug (11) snaps into the blocking-hole (12) of the blocking-shutter (13).

Also at the same time, blocking-shutter (16) is forced upwards via bar (15), which is mounted with joint (14) to bar (8). Thereby, the flush-button (D) is blocked twice with blocking-plug (18) and blocking-shutter (16), by means of bars (17), (19), (21) and (23).

Release of the toilet seat

Spring (26) presses the entire mechanism back into a state of rest; the urine outlet seal (B) thus sinks down and closes the urine outlet, and the toilet flushing is released via a sinking of blocking-plug (11) and blocking-shutter (16).

Pressing the flush-button with a released toilet seat

Pressing flush-button (D) causes via bar (17) a snap of blocking-plug (18) into blocking-hole (16a) of blocking-shutter (16).

At the same time, the stiff bar (19) – (21), revolving mounted on axle (20), is now forced backwards at the joint (18).

Therefore blocking-shutter (13) moves via bar (23) forward, which is mounted via joint (22) to bar (21).

Thereby, the urine outlet is blocked twice via blocking-plug (11), which cannot snap into blocking-hole (12), and via blocking-shutter (16) (by means of (10), (8) and (15)), which is fixed through the locked blocking-plug (18).

Flush-button (D) moves backward only if the flushing procedure is finished. Thereby, an opening of the urine outlet seal is also excluded, provided that the toilet seat (A) is sat on during flushing.

Tipping up of the toilet seat

Toilet seat (A) revolves mounted on axle (1) via fixed bearing (25). Tackle (24) is fixed mounted on bearing (25) and bar (8). Tipping up the toilet seat (A) causes a turn to the right of bearing (25) around axle (1). Thereby tackle (24) draws bar (8) upwards, and the urine outlet seal lifts, and the toilet flushing is blocked. After tipping down the toilet seat (A), spring (26) forces the mechanism back to the state of rest.

Detail A

Detail A shows details of both blocking mechanisms. Blocking-plugs (11) and (18) can snap into the blocking-holes (16a) and (12). Thereby, both blocking-shutters (13) and (16) become immovable. After the snaping out of blocking-plugs (10) and (17), both blocking-shutters (13) and (16) become movable upward again along their grooves (12a), in which axles (10) and (17) stick.

The foregoing describes embodiments of the present invention, and it will be appreciated that modifications can be made without departing from the scope of the invention.

Throughout this specification and the claims which follow, unless the context requires otherwise, the word "comprise", and variations such as "comprises" and "comprising", will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

The reference to any prior art in this specification is not, and should not be taken as, an acknowledgment or any form of suggestion that that prior art forms part of the common general knowledge in Australia.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A urine separating toilet for the separate collection and drainage of urine and faeces comprising a urine outlet, a faecal outlet, a toilet bowl and a toilet seat, said toilet further comprising:

a) a device for opening the urine outlet if a user sits down on the toilet or sits down on the toilet seat or tips the toilet seat backward;

b) a device for closing the urine outlet if the user rises and/or tips the toilet seat downward; and

c) a device for flushing the entire toilet bowl whereby solids such as toilet paper can be transported with the flushing water from the area of the urine outlet to the area of the faecal outlet.

2. A urine separating toilet according to claim 1, wherein the urine is disposed water free.

3. A urine separating toilet according to claim 1 or claim 2, including means for blocking a flushing valve if a user sits down on the toilet or sits down on the toilet seat or tips the toilet seat backward, said means releasing the flushing valve if the user rises and/or tips the toilet seat downward.

4. A urine separating toilet according to any one of claims 1 to 3, wherein no partition wall is located between the urine and faecal outlets.

5. A urine separating toilet according to any one of claims 1 to 4, wherein when the urine outlet is closed any liquids around and/or upon the closed urine outlet are drained by the force of gravity into the faecal outlet.

6. A urine separating toilet according to any one of claims 1 to 5, wherein the toilet bowl shows protrusions at an inner surface of the toilet bowl to force the urine more effectively into the urine outlet.

7. A urine separating toilet according to any one of claims 1 to 6, wherein the toilet seat covers a flush-button or buttons when the toilet seat is tipped up.

8. A urine separating toilet according to any one of claims 1 to 7, wherein the faecal outlet is designed as a vacuum drain.

9. A urine separating toilet according to any one of claims 1 to 5, wherein an inner surface of the toilet bowl is equipped with a dirt and water rejecting nano surface layer.

10. A urine separating toilet according to any one of claims 6 to 8, wherein the inner surface of the toilet bowl is equipped with a dirt and water rejecting nano surface layer.

11. A method for operating a urine separating toilet having a urine outlet, a faecal outlet, a toilet bowl and a toilet seat, said method comprising the steps of:

a) opening the urine outlet if a user sits down upon the toilet or sits down on

the toilet seat or tips the toilet seat backward;

b) closing the urine outlet if the user rises and/or tips the toilet seat downward; and

c) flushing the entire toilet bowl whereby solids such as toilet paper are transported with the flushing water from the area of the urine outlet into the area of the faecal outlet.

12. A method according to claim 11, including blocking a flushing valve if a user sits down upon the toilet or sits down on the toilet seat or tips the toilet seat backward, and releasing the flushing valve if the user rises and/or tips the toilet seat downward.

13. A urine separating toilet substantially as hereinbefore described with reference to the accompanying drawings.

14. A method substantially as hereinbefore described with reference to the accompanying drawings.

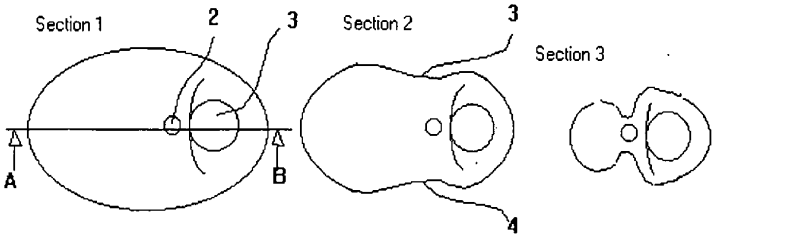
DATED this 17TH day of JANUARY, 2005

Ulrich Braun

by DAVIES COLLISON CAVE

Patent Attorneys for the applicant(s)

Fig. 2


Section 1
2
3
Section 2
3
Section 3
A
B
4

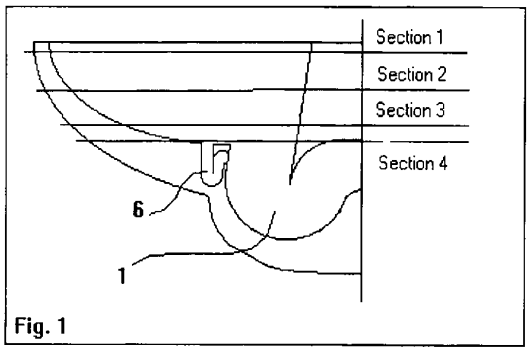

Section 1
Section 2
Section 3
Section 4
6
1

Fig. 1

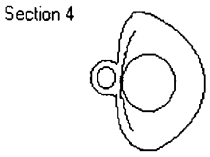
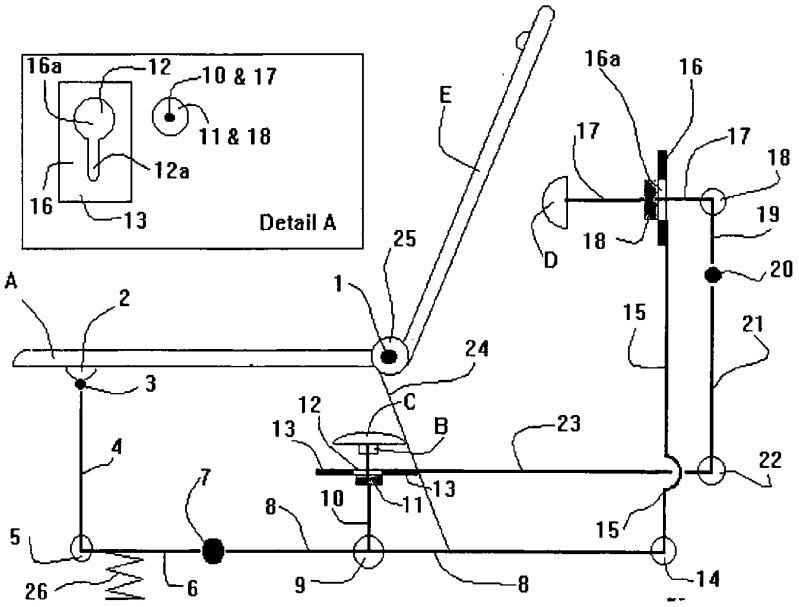

Section 4

Fig. 3


16a
12
10 & 17
11 & 18
12a
16
13
Detail A
E
16a
16
17
17
18
19
20
D
18
25
A
2
1
15
21
24
3
12
C
B
23
13
4
22
7
13
10
11
8
15
5
26
6
9
8
14