



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
23.07.2008 Bulletin 2008/30

(51) Int Cl.:
A47K 13/30 (2006.01)

(21) Application number: **08000591.1**

(22) Date of filing: **14.01.2008**

(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 MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA MK RS

(72) Inventor: **Huang, Hai-Sheng**
Dongsing Village, Longtan Township
Taoyuan County 325 (TW)

(74) Representative: **Becker Kurig Straus**
Patentanwälte
Bavariastrasse 7
80336 München (DE)

(30) Priority: **16.01.2007 TW 96200878 U**

(71) Applicant: **Huang, Hai-Sheng**
Dongsing Village, Longtan Township
Taoyuan County 325 (TW)

(54) **Automatic cleaning device for toilet seat**

(57) An automatic cleaning device for a toilet seat includes a frame-shape seat (2); a cover (3), a rear side of which is pivoted to the seat (2) to be lifted upward or covered on the seat (2); a liquid transmission device (33) for exporting detergent; and a control unit. The seat (2) allows a user to sit, a bottom of the cover (3) is provided with a tube coil (31) connected to the liquid transmission device (33), and the tube coil (31) is provided with through-holes (311) aligned alternately. After the toilet has been used and the cover (3) has been covered on the seat (2), the control unit enables the detergent which is exported by the liquid transmission device (33) to be exported from the through-holes (311) of the tube coil (31) to clean a surface of the seat (2), for maintaining sanitarness.

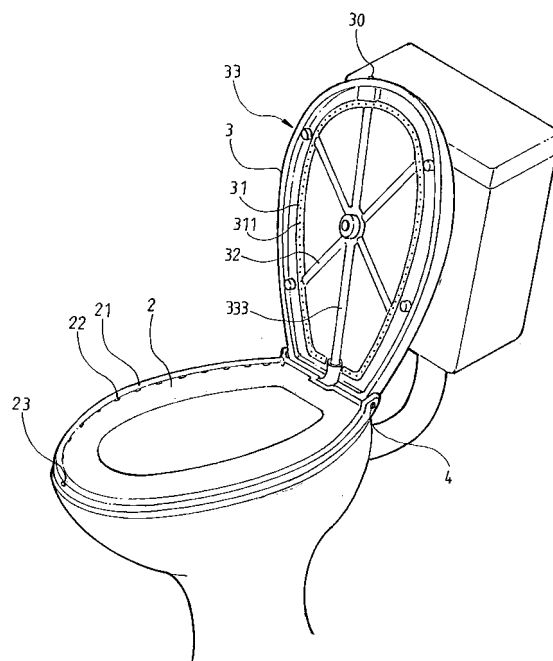


FIG. 2

Description

BACKGROUND OF THE INVENTION

a) Field of the Invention

[0001] The present invention relates to an automatic cleaning device for a toilet seat 2, and more particularly to an automatic cleaning device which can clean and parch a toilet seat 2 automatically after the toilet has been used.

b) Description of the Prior Art

[0002] Referring to FIG. 1, an ordinary bathroom toilet in a public place includes a toilet body 1, a seat 11, and a cover 12. As the toilet belongs to a public property, it happens often that a user without public virtue steps on the seat 11 with both feet to use the toilet without lifting up the seat 11 due to a concern of sanitary problem, thereby contaminating the seat 11, such that following users are unable to use or dare not to use the toilet at all. Although some places provide mats to be paved on the seat 11, it is rather troublesome in using. In addition, if the user sits directly on the contaminated seat 11 without paying attention to the sanitary condition, it is possible that he or she will be infected by bacteria or viruses. On the other hand, it is also rather dangerous to an ordinary female, who wear high heels, to squat on the seat 11.

SUMMARY OF THE INVENTION

[0003] Accordingly, it is the primary objective of the present invention is to provide an automatic cleaning device for a toilet seat which can automatically clean and parch the seat to keep the seat clean after the toilet has been used. The present invention includes a seat, a cover, a liquid transmission device and a control unit, wherein the frame-shape seat is surrounded at peripheries of a top of a toilet body, a rear side of which is provided with a pivoting portion connected to a driving mechanism. Peripheries of the seat are provided with protruded ribs, inner rims of which are disposed with through-holes aligned alternately, with the through-holes being located above an interior side at the top of the toilet body. A bottom rim of the cover is provided with a tube coil having alternate through-holes, with the tube coil being connected to a transmission tube by a plurality of manifolds. The transmission tube is connected to a valve which is connected to an electromagnetic water valve and an electromagnetic air valve for connecting respectively to a container holding detergent and an electro-thermal element, such that when a toilet flushing device is activated, the cover will be covered on the seat by the driving mechanism, water will be spraying on the seat from the through-holes of the tube coil at the bottom of the cover by the liquid transmission device and the control unit, and the seat will be parched by hot air of the electro-thermal el-

ement, thereby achieving a result of cleaning the toilet seat.

[0004] It is another objective of the present invention that the driving mechanism connected to the seat is provided with a turning wheel and a piston which is connected at an eccentric position of the turning wheel. By an extension and compression of the piston, the turning wheel can rotate, so as to lift up or put down the seat.

[0005] It is a further objective of the present invention that the valve connected to the transmission tube of the cover is connected to a water pipe, the transmission tube is provided with a groove having a through-hole, and the water pipe is provided with a sheath portion corresponding to the groove. The sheath portion is provided with a through-hole, enabling the sheath portion to be latched into the groove. Therefore, when the cover is lifted up and put down, the transmission tube will be driven to rotate, allowing the sheath portion to be offset or overlapped with the through-hole of the groove, so as to constitute a control for stopping or discharging water.

[0006] It is yet a further objective of the present invention that a front end of the seat is provided with a latch groove, and a lower rim at a front end of the cover is provided with a push button which is disposed with a hook sheathed into a spring, such that when the cover is put down, the seat and the cover can be both lifted up after cleaning the seat, by locking the hook at the latch groove of the seat.

[0007] To enable a further understanding of the said objectives and the technological methods of the invention herein, the brief description of the drawings below is followed by the detailed description of the preferred embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008]

FIG. 1 shows a perspective view of a conventional toilet.

FIG. 2 shows a perspective view of the present invention.

FIG. 3 shows a plan view of a cover of the present invention.

FIG. 4 shows a cross-sectional view of a cover and a seat of the present invention.

FIG. 5 shows a piping diagram of the present invention.

FIG. 6 shows a schematic view of a driving mechanism of the present invention.

FIG. 7 shows a cross-sectional view of a valve of the present invention.

FIG. 8 shows a schematic view of an embodiment of the present invention, wherein water is discharged from a safety valve.

FIG. 9 shows a schematic view of an embodiment of the present invention upon cleaning a seat.

FIG. 10 shows a schematic view of an embodiment

of the present invention, wherein water is stopped by a valve.

FIG. 11 shows a schematic view of an embodiment of the present invention, wherein a cover and a seat are engaged.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0009] Referring to FIGS. 2 to 5, and 11, the present invention includes a seat 2, a cover 3, a liquid transmission device 33, and a control unit 39. The frame-shape seat 2 is surrounded at peripheries of a top of a toilet body, a rear side of which is provided with a pivoting portion 4. Peripheries of the seat 2 are provided with protruded ribs 21, inner rims of which are disposed with through-holes 22 aligned alternately and located above an interior side at the top of the toilet body. A front end of the seat 2 is provided with a latch groove 23.

[0010] A rear side of the cover 3 is pivoted at the pivoting part 4 of the seat 2, so as to be lifted up or to be covered on the seat 2. A lower rim at a front end of the cover 3 is provided with a push button 30 which is disposed with a hook 302 sheathed into a spring 301. A bottom of the cover 3 is provided with a tube coil 31 which is corresponding to the ribs 21 of the seat 2, and is provided with alternate through-holes 311. In addition, the tube coil 31 is extended out of the cover 3 with a valve 34.

[0011] The liquid transmission device 33 includes further a container 37 for holding detergent, and a transmission tube 333 which is connected between the container 37 and the valve 34, allowing the detergent inside the container 37 to be exported to the tube coil 31 through the transmission tube 333 and the valve 34. The tube coil 31 is connected to the transmission tube 333 by a plurality of manifolds 32, and the transmission tube 333 is connected to the valve 34.

[0012] On the other hand, the valve 34 is further connected to an electromagnetic water valve 35 and an electromagnetic air valve 36 for connecting respectively to the container 37 and an electro-thermal element 38. The container 37 is provided with a sterilized water dripping device 371, and is connected to a tap water pipe; whereas, the electromagnetic water valve 35, the electromagnetic air valve 36, and the electro-thermal element 38 are connected respectively to the control unit 39.

[0013] Referring to FIG. 6, the pivoting portion 4 which is connected to the seat 2 includes further a driving mechanism which is composed of a turning wheel 41 and a piston 42. The seat 2 is connected at an axis of the turning wheel 41, and the piston 42 is connected at an eccentric position of the turning wheel 41, such that the turning wheel 41 can rotate by an extension and compression of the piston 42, thereby lifting up or putting down the seat 2.

[0014] Referring to FIG. 7, the valve 34 connected to the transmission tube 333 is connected to a water pipe 5, wherein the transmission tube 333 is provided with a

groove 332 having a through-hole 331, and the water pipe 5 is provided with a sheath part 51, which is corresponding to the groove 332 and is disposed with a through-hole 511, allowing the sheath part 51 to be latched into the groove 332, such that when the cover 3 is lifted up and put down, the transmission tube 333 will be driven to rotate, enabling the sheath part 51 to be offset or overlapped with the through-holes 511, 331 of the groove 332, so as to constitute a control for stopping or discharging water.

[0015] By the assembly of the aforementioned parts, the automatic cleaning device for the toilet seat is constituted, such that when a toilet flushing device is activated after the toilet has been used, water will be spraying on the seat 2 from the through-holes 311 on the tube coil 31 of the cover 3, and the seat 2 will be parched by hot air, thereby achieving a result of cleaning the toilet seat.

[0016] Referring to FIGS. 8, 9, 5, and 6, when the toilet flushing device is activated after the toilet has been used, the piston 42 will be extended by the control unit 39 to drive the turning wheel 41 to rotate, so as to put down the seat 2; at a same time, the electromagnetic water valve will be opened to transport the water in the container 37 and the sterilized water dripping device 371, along the water pipe 5. As the sheath portion 51 of the water pipe 5, and the through-holes 511, 331 of the groove 332 of the transmission tube 333 are opened to discharge the water due to the rotation of the transmission tube 333, the water will be transported to the tube coil 31 of the cover 3 from the transmission tube 333, and spraying on the seat 2 from the through-holes 311 to clean the seat 2. In addition, the electromagnetic water valve 35 is closed after cleaning the seat 2; whereas, the electromagnetic air valve 36 and the electro-thermal element 38 are activated at a same time, allowing the hot air to be blown toward the seat 2 from the through-holes 311 on the tube coil 31 of the cover 3, so as to parch the seat 2. Finally, after a certain time, the electromagnetic air valve 36 and the electro-thermal element 38 are deactivated, and this accomplishes a cycle of cleaning operation.

[0017] Referring to FIG. 10 and FIG. 11, after cleaning and parching, the piston 42 is compressed by the control unit 39 to drive the turning wheel 41 to rotate, so as to lift up the seat 2. At a same time when the seat 2 is lifted up, the sheath portion 51 of the water pipe 5 and the through-holes 511, 311 of the groove 332 of the transmission tube 333 are offset by the rotation of the transmission tube 333 to stop the water, wherein the hook 302 of the push button 30 at the lower rim of the front end of the seat 2 is latched at the latch groove 23 of the seat 2 by a tension of the spring 301, allowing the seat 2 and the cover 3 to be lifted up together. On the other hand, when the toilet is used once more, the seat 2 can be put down again just by pressing down the push button 30 to release the hook 302 from the latch groove 23.

[0018] On the other hand, referring to FIG. 4, the control unit 39 includes further a detection switch 24 at a

bottom of the seat 2. When the detection switch 24 has detected that the seat 2 is at the top of the toilet body, the detection switch 24 will be turned on to open the control unit 39; whereas, when the detection switch 24 has detected that the seat 2 is lifted up with respect to the toilet body, the control unit 39 is closed. Moreover, the detection switch 39 can be also configured as a normal-open push switch which is opened normally. When the seat 2 is at the top of the toilet body, the normal-open push switch will be at a state for turning on the control unit 39 by a weight of the seat 2; whereas, when the seat 2 is lifted up, the normal-open push switch will be closed. Therefore, if the seat 2 is lifted up, the toilet flushing device of the present invention will not be activated. On the contrary, when the seat 2 is at the top of the toilet body, the toilet flushing device can be activated effectively.

[0019] Accordingly, the present invention is provided with the cover having the water-spraying holes, in association with the multiple tubes, to automatically clean and parch the toilet seat to maintain the sanitarness of the toilet seat after the toilet has been used.

[0020] To further manifest the advancement and practicability of the present invention, the present invention is compared with a conventional cup as below:

[0021] It is of course to be understood that the embodiments described herein is merely illustrative of the principles of the invention and that a wide variety of modifications thereto may be effected by persons skilled in the art without departing from the spirit and scope of the invention as set forth in the following claims.

Claims

1. An automatic cleaning device for a toilet seat comprising:
 - a frame-shape seat 2, which is surrounded at peripheries of a top of a toilet body, a rear side of the toilet body being provided with a pivoting part 4, peripheries of the seat 2 being provided with protruded ribs 21, and inner rims of the ribs 21 being disposed with through-holes 22 aligned alternately and located above an interior side of the top of the toilet body;
 - a cover 3, a rear side of which is pivoted to the pivoting portion 4 of the seat 2, so as to be lifted upward or covered on the seat 2, and a bottom of which is provided with a tube coil 31 corresponding to the ribs 21 of the seat 2 and having alternate through-holes 22, with the tube coil 21 being extended out of the cover 3 with a valve 34; a liquid transmission device 33, which includes at least a container 37 holding detergent, and a transmission tube 333 connected between the container 37 and the valve 34, allowing the detergent in the container 37 to be exported to the tube coil 31 through the transmission tube 333

and the valve 34; and

a control unit 39 which opens or closes the valve 34, with the control unit 39 opening the valve 34 when the cover 3 is covered on the seat 2, allowing the detergent in the tube coil 31, which is transmitted by the liquid transmission device 33, to be exported from the through-holes 311 and to clean a surface at a top rim of the seat 2; the detergent being falling into the toilet body after cleaning.

2. The automatic cleaning device for a toilet seat according to claim 1, wherein the pivoting portion 4 includes further a driving mechanism which is composed of at least one turning wheel 41 and one piston 42, the seat 2 is connected to an axis of the turning wheel 41, and the piston 42 is connected at an eccentric position of the turning wheel 41, such that the turning wheel 41 rotates by an extension of the piston 42, thereby lifting up or putting down the seat 2.
3. The automatic cleaning device for a toilet seat according to claim 1, wherein the tube coil 31 and the transmission tube 333 are connected by a plurality of manifolds 32.
4. The automatic cleaning device for a toilet seat according to claim 1, wherein the control unit 39 includes further a detection switch 24 at a bottom of the seat 2; when the seat 2 being located at the top of the toilet body, the detection switch 24 being turned on; when the seat 2 being lifted up with respect to the toilet body, the detection switch 24 being closed.
5. The automatic cleaning device for a toilet seat according to claim 4, wherein the detection switch 24 is a normal-open push switch; when the seat 2 being located at the top of the toilet body, the normal-open push switch being turned on by a weight of the seat 2.
6. The automatic cleaning device for a toilet seat according to claim 1, wherein the control unit 39 includes further an electromagnetic water valve 35 and an electromagnetic air valve 36, with the valve 34 being provided between the electromagnetic water valve 35, the electromagnetic air valve 36 and the transmission tube 36.
7. The automatic cleaning device for a toilet seat according to claim 6, wherein the electromagnetic water valve 35 is connected to a container 37 holding detergent and the electromagnetic air valve 36 is connected to an electro-thermal element 38.
8. The automatic cleaning device for a toilet seat according to claim 6, wherein the valve 34 connected to the transmission tube 333 is connected to a water

pipe 5, the transmission tube 333 of the cover 3 is provided with a groove 332 having a through-hole 331, and the water pipe 5 is provided with a sheath portion 51 corresponding to the groove 332; the sheath portion 51 being provided with a through-hole 511, allowing the sheath portion 51 to be latched into the groove 332, such that when the cover 3 is lifted up and put down, the transmission tube 333 is driven to rotate, enabling the sheath portion 51 to be offset or overlapped with the through-holes 331, 511 of the groove 332, thereby constituting a control for stopping or discharging water.

9. The automatic cleaning device for a toilet seat according to claim 1, wherein a front end of the seat 2 is provided with a latch groove 23, and a lower rim at a front end of the cover 3 is provided with a push button 30 which is disposed with a hook 302 sheathed into a spring 301 for being latched into the latch groove 23 of the seat 2, after the cover 3 has been put down.
10. The automatic cleaning device for a toilet seat according to claim 1, wherein the container 37 includes further a sterilized water dripping device 371.

30

35

40

45

50

55

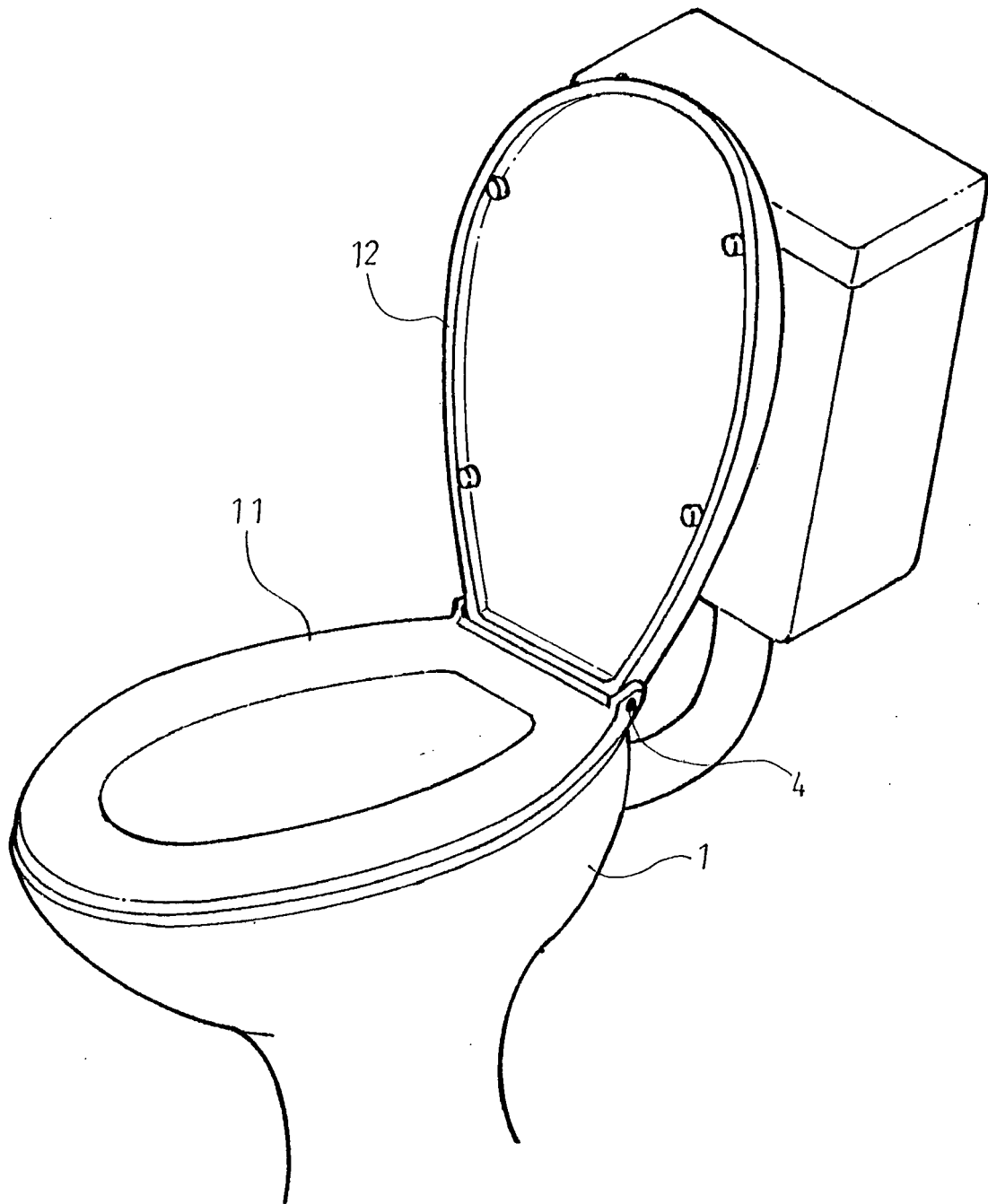


FIG.1
Prior Art

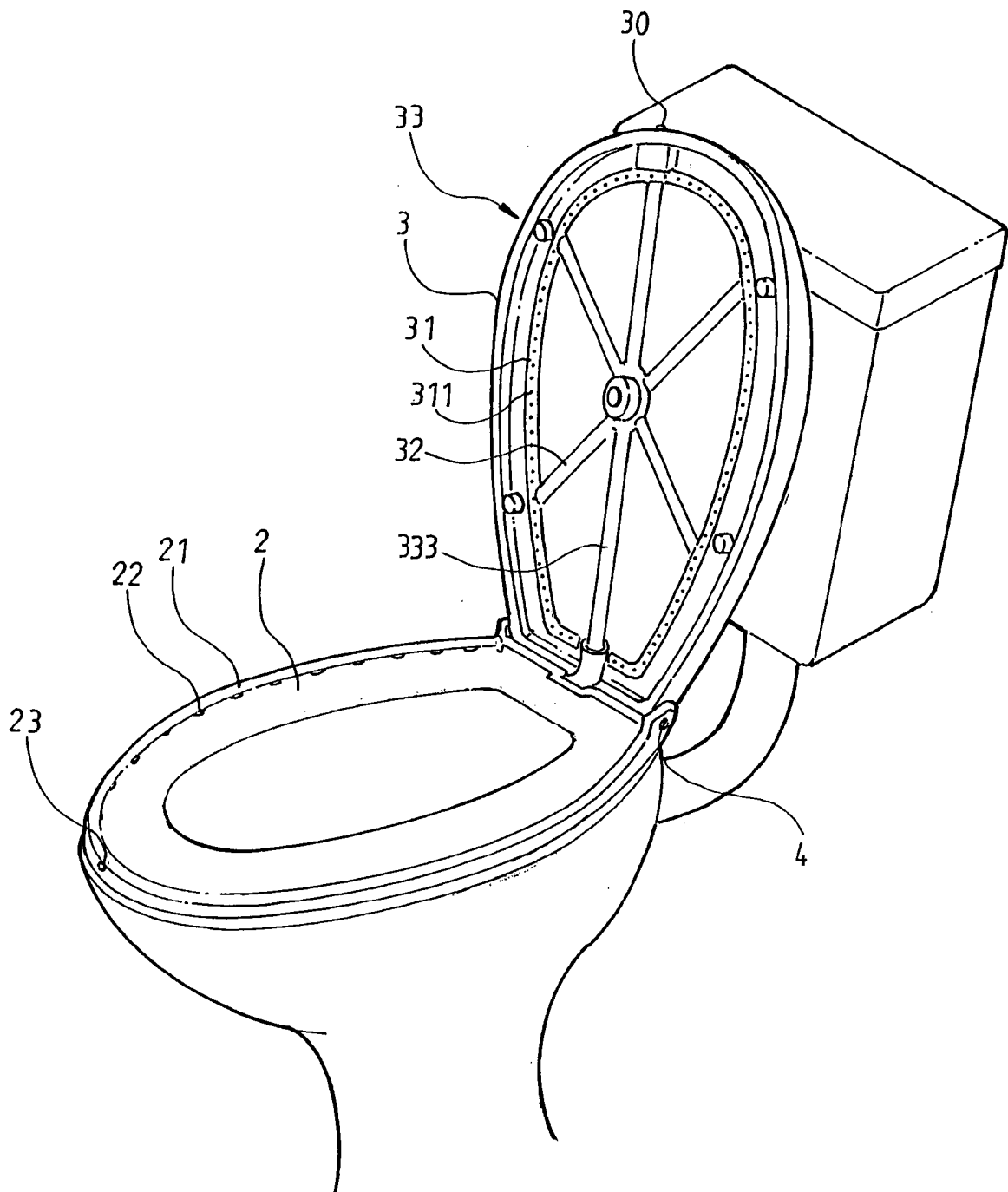


FIG. 2

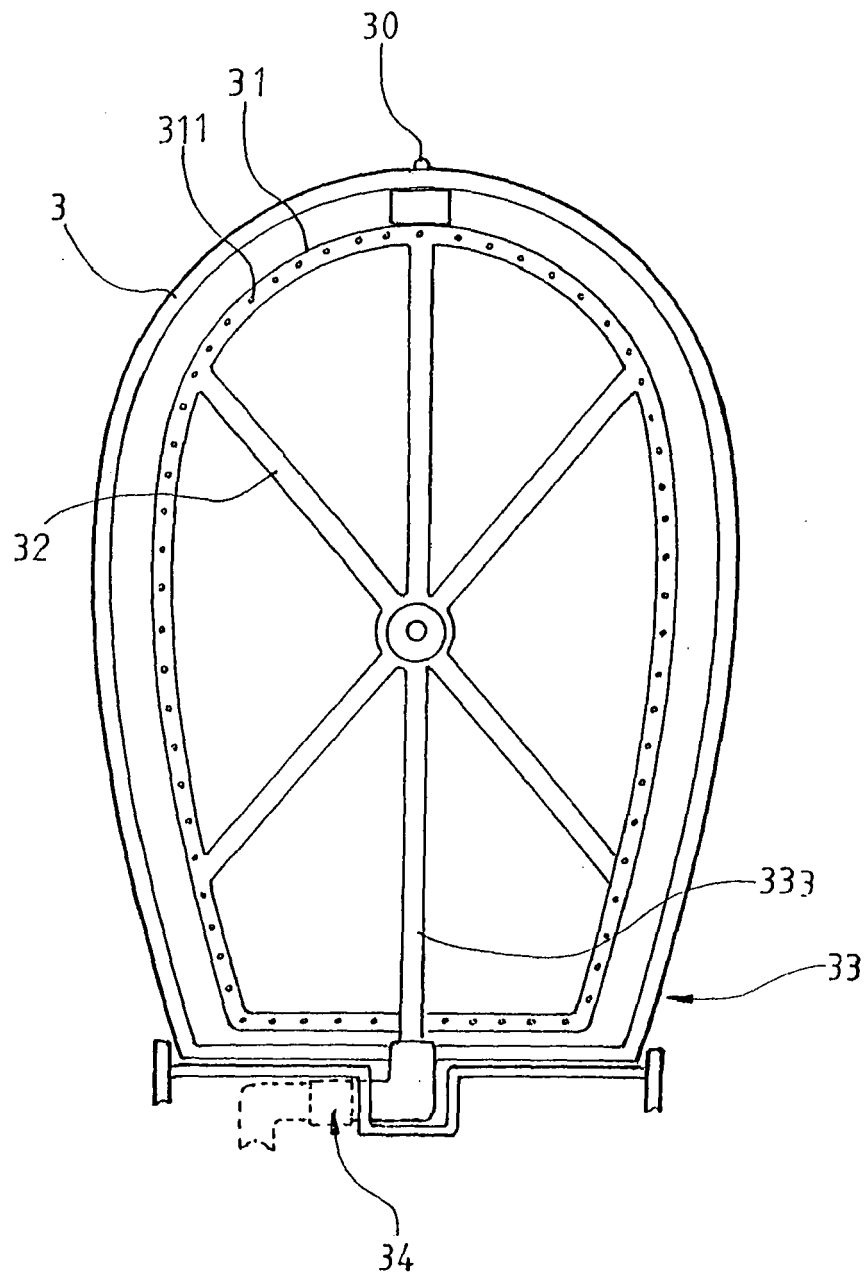


FIG. 3

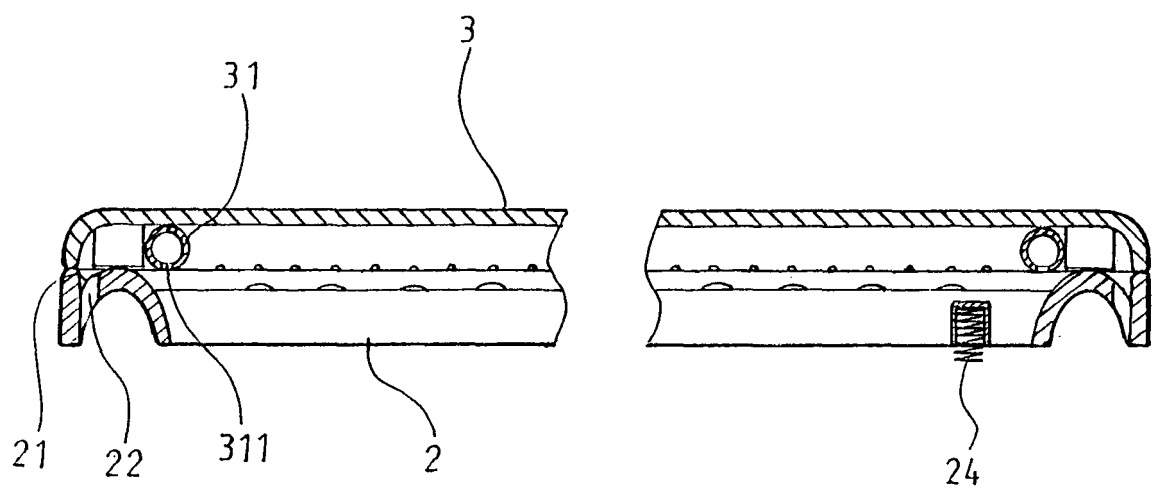


FIG. 4

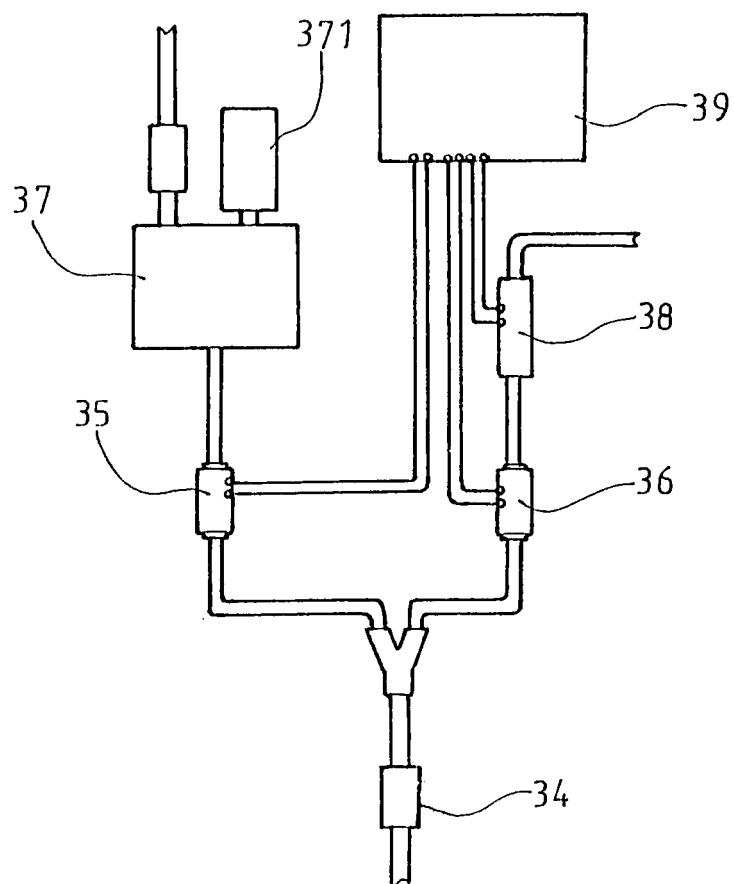


FIG. 5

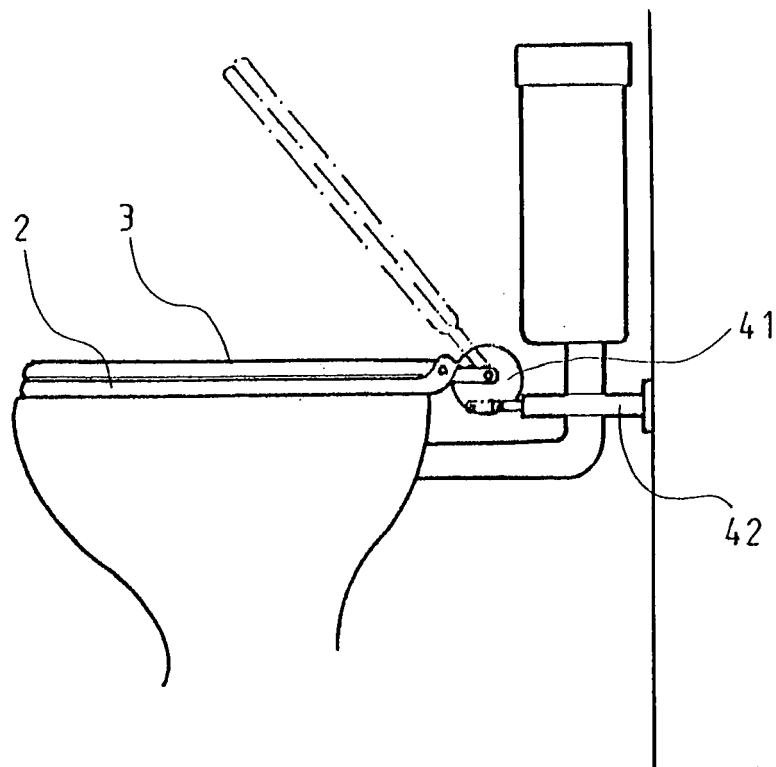


FIG. 6

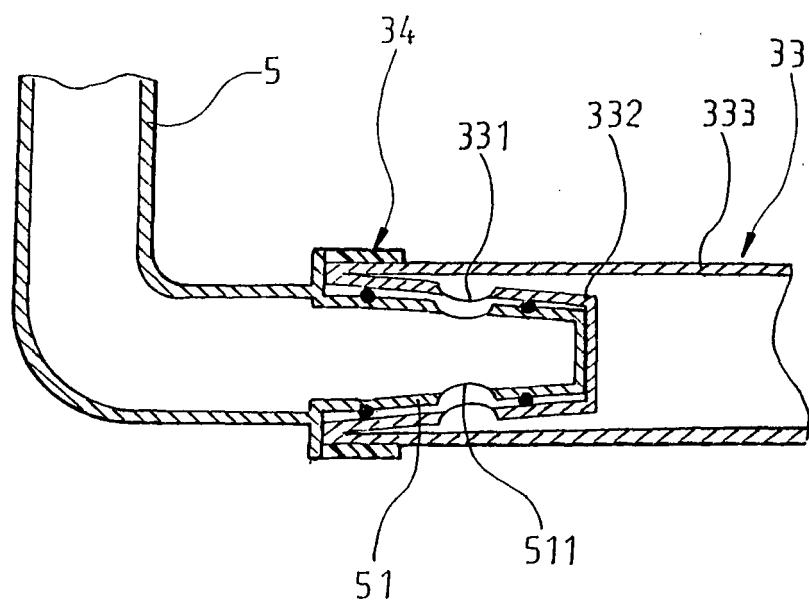


FIG. 7

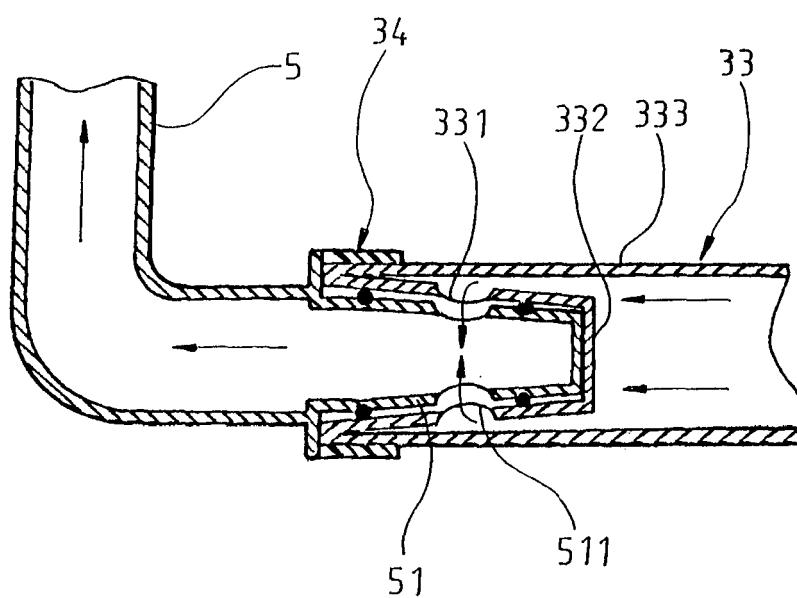


FIG.8

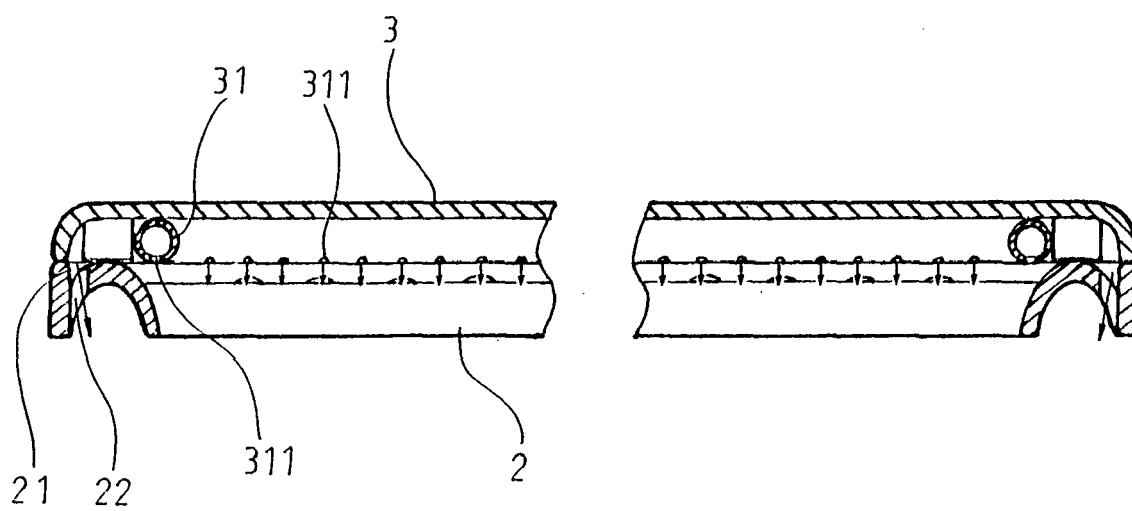


FIG.9

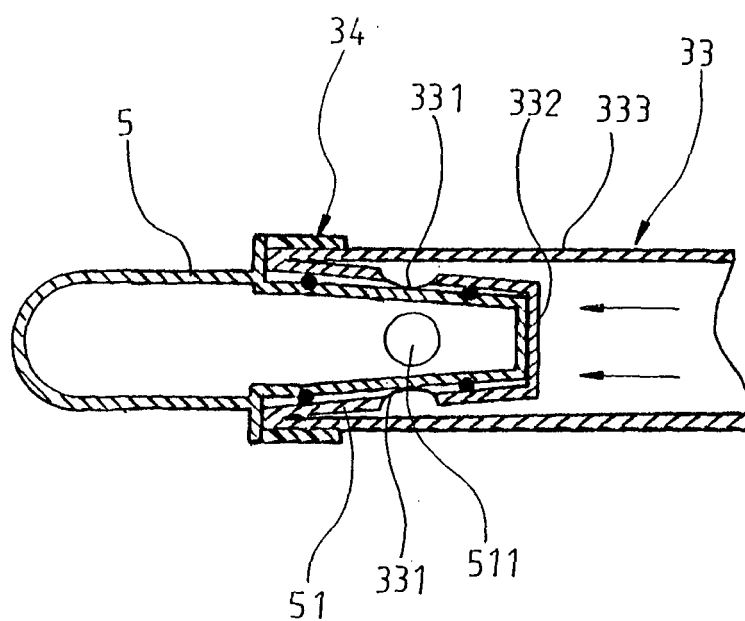


FIG.10

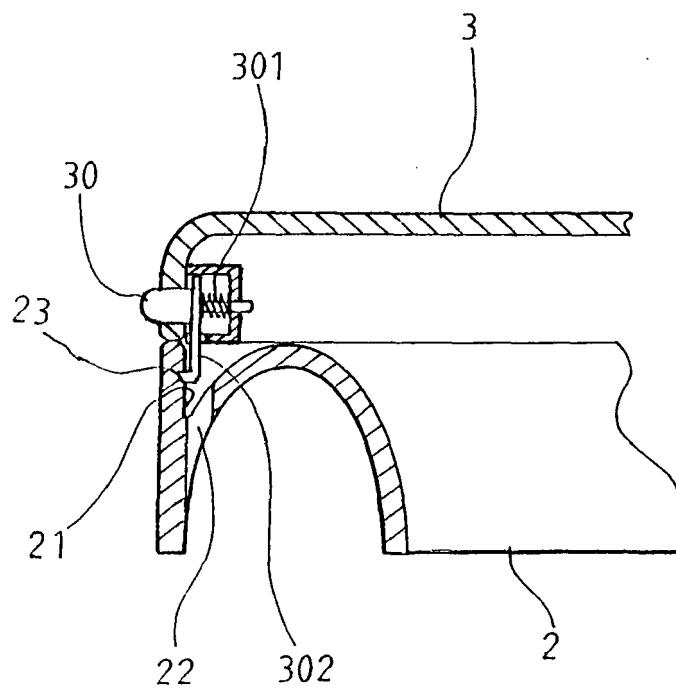


FIG.11



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 08 00 0591

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 29 07 754 A1 (GERTRUD STOCKBURGER FA) 4 September 1980 (1980-09-04) * the whole document *	1-3,6,7,10	INV. A47K13/30
X	US 4 924 532 A (PENNESTRI DOMENICK [US]) 15 May 1990 (1990-05-15) * the whole document *	1	
A		4-7,9	
A	US 4 980 931 A (MEISELS CHASKEL [US]) 1 January 1991 (1991-01-01) * the whole document *	1,6-8	
A	GB 2 204 611 A (MAK CHAI LEUNG) 16 November 1988 (1988-11-16) * the whole document *	1,2	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47K
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 11 April 2008	Examiner Fajarnés Jessen, A
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

1
EPO FORM 1503 03.82 (F04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 00 0591

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

11-04-2008

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 2907754	A1	04-09-1980	NONE	
US 4924532	A	15-05-1990	NONE	
US 4980931	A	01-01-1991	NONE	
GB 2204611	A	16-11-1988	NONE	