

[54] **ARRANGEMENT FOR AUTOMATICALLY  
CLEANING A CLOSET SEATING SURFACE  
ON A CLOSET SEAT RING AFTER USE**

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[58] Field of Search ..... 4/1, 229, 230, 233

### [56] References Cited

#### UNITED STATES PATENTS

2,465,460 3/1949 Kronhaus..... 4/233

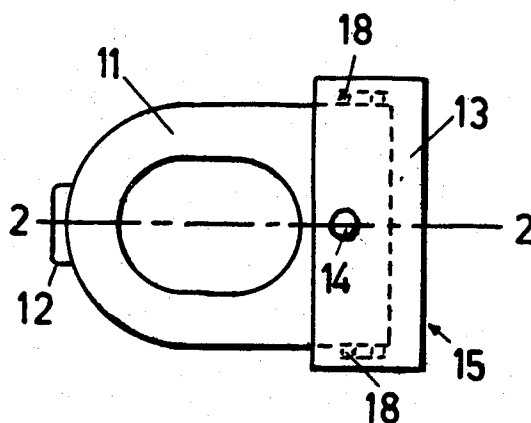
2,494,894	1/1950	Monaghan .....	4/233 UX
2,551,882	5/1951	Hartman .....	4/233
2,592,167	4/1952	Monaghan .....	4/233
2,961,664	11/1960	Davidson .....	4/229
3,599,246	8/1971	Bramati .....	4/233

Primary Examiner—Henry K. Artis

### [57] ABSTRACT

An arrangement for automatically cleaning a closet seating surface on a closet seat ring after use is disclosed. The arrangement comprises a cleaning box disposed behind or laterally of a closet bowl and containing means for washing, disinfecting and drying the seating surface on the seat ring which, for this cleaning, is turned up into a vertical position and then moved into the cleaning box. In this movement, the seat ring is guided by guide rails; it can be moved manually or by power driven means.

**29 Claims, 16 Drawing Figures**



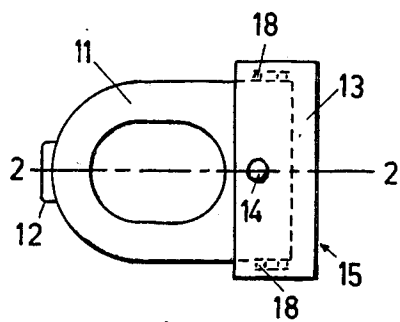


Fig. 1

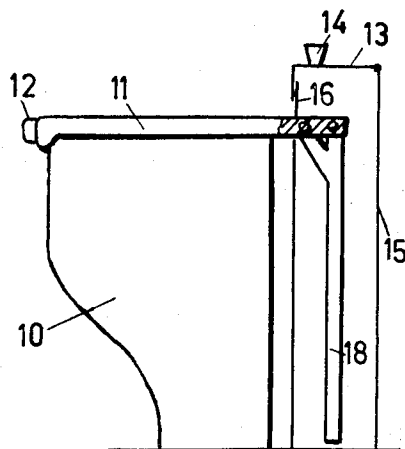


Fig. 2

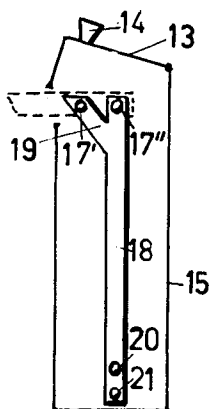


Fig. 3

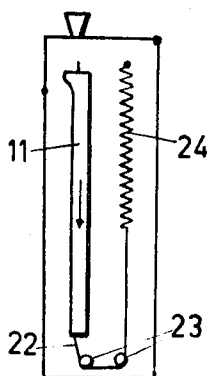


Fig. 4

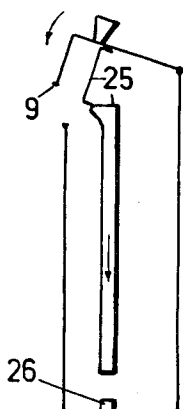


Fig. 5

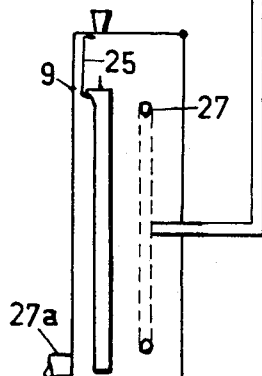


Fig. 6

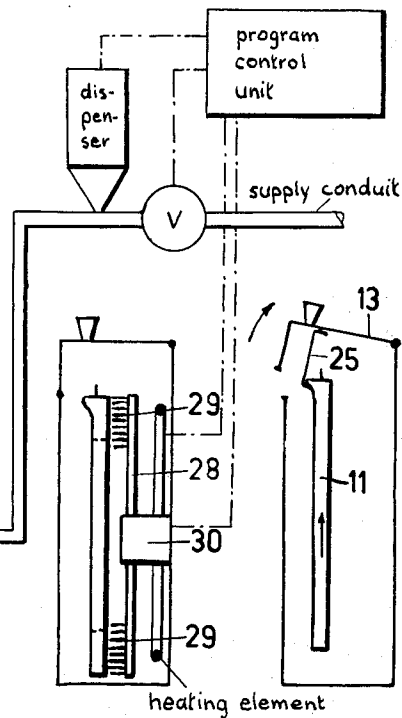


Fig. 7

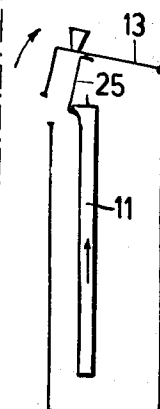


Fig. 8

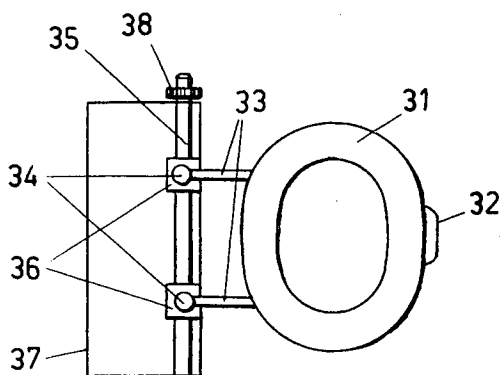


Fig. 9

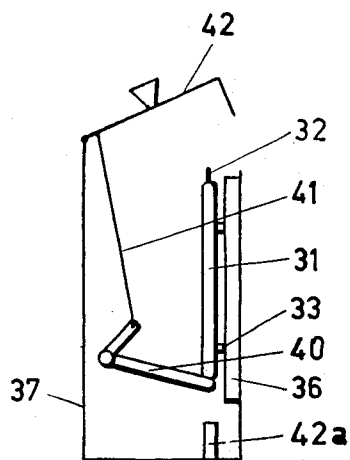


Fig. 12

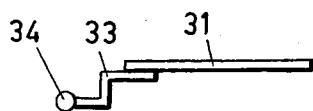


Fig. 10

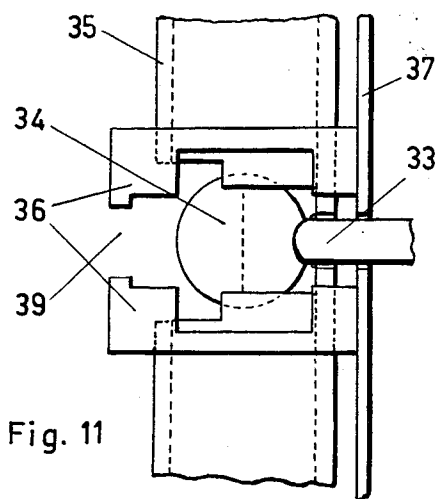


Fig. 11

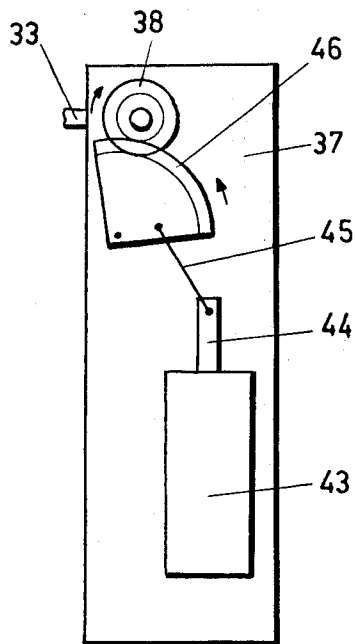


Fig. 13

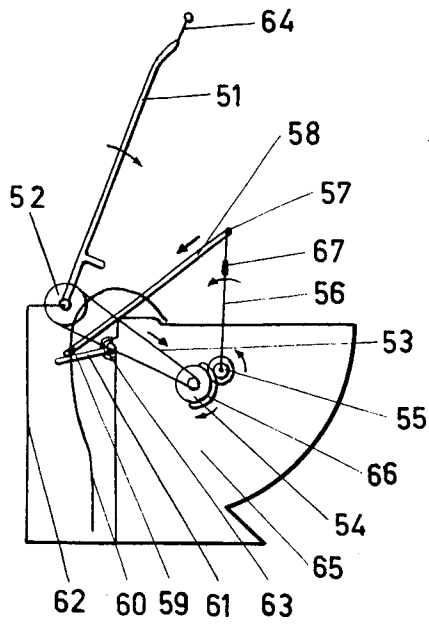


Fig. 14

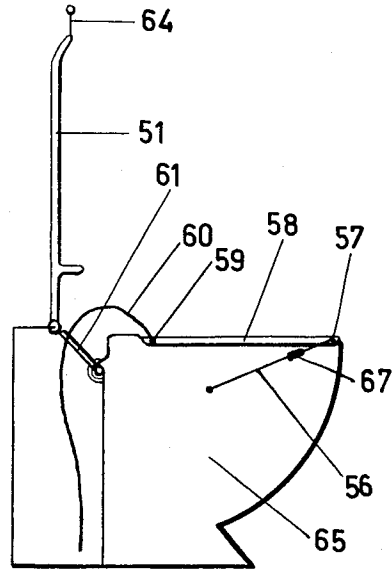


Fig. 15

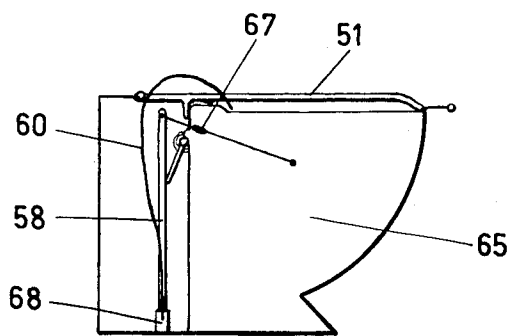


Fig. 16

# ARRANGEMENT FOR AUTOMATICALLY CLEANING A CLOSET SEATING SURFACE ON A CLOSET SEAT RING AFTER USE

Closet seating surfaces are frequently soiled and unhygienic, particularly in toilets which are used by many people, for example in public toilets.

In order to combat this situation, paper rings, for single use, are sometimes provided in such toilets. The handling of such rings is however awkward and moreover the dispenser of the paper rings is often empty.

The aim of the present invention is therefore to provide an arrangement for automatically cleaning a closet seating surface after use.

The arrangement according to the invention comprises a cleaning box arranged behind or at one side of a closet bowl and adjacent thereto for receiving a closet seat ring; two guide rails for guiding the closet seat ring between a position of use on the closet bowl and a cleaning position in the cleaning box; a supply conduit for the supply of a cleaning liquid into at least one distributing line for spraying the liquid onto the closet seat ring when the latter is in the cleaning box; and a triggering device for starting the supply of cleaning liquid to the distributing line.

Preferred embodiments of the invention are described hereinafter with reference to the accompanying drawings in which:

FIG. 1 is a plan view of a closet arrangement,

FIG. 2 is a side view of the closet arrangement of FIG. 1, partly in cross section on line 2—2 in FIG. 1,

FIG. 3 shows a side view of a guide rail in a cleaning box,

FIG. 4 diagrammatically illustrates a device for pulling the closet seat ring into the cleaning box,

FIG. 5 shows a means for starting the supply of cleaning water,

FIG. 6 shows a device for distributing the cleaning water in the cleaning box,

FIG. 7 shows a modified device for distributing the cleaning water,

FIG. 8 diagrammatically illustrates a means for raising the closet seat ring in the cleaning box,

FIG. 9 is a plan view of a closet arrangement with a cleaning box disposed laterally of a closet bowl,

FIG. 10 is a front view of the closet seat ring of the arrangement shown in FIG. 9,

FIG. 11 is an enlarged view of a portion of FIG. 9, showing one of the guide rails,

FIG. 12 diagrammatically shows a device for closing the cover of a cleaning box,

FIG. 13 shows drive means for rotating a hollow shaft in the arrangement of FIGS. 9 to 12,

FIG. 14 is a side view of a further closet arrangement with a cleaning box disposed behind the closet bowl,

FIG. 15 shows the arrangement of FIG. 14 in the position of use, and

FIG. 16 shows the same closet arrangement in the cleaning position.

In the various Figures of the drawings only the essential parts are shown diagrammatically, less important parts have been omitted for the sake of clarity.

In FIG. 1 there is shown a plan view of a closet arrangement with a cleaning box disposed behind a closet bowl. The closet arrangement is illustrated in a position immediately before or after use. A closet seat ring 11 has an upper side which forms a seating surface, and a

rear end which projects into a cleaning box 15. The closet seat 11 is provided at its forward end with a handle 12 which may be gripped for raising the seat. The cleaning box 15 is equipped with a hinged cover 13 having a handle 14 by means of which it may be opened.

FIG. 2 is a side view of the closet arrangement, partly in section, in the same position as in FIG. 1. The cleaning box 15 is closed by cover 13. A slidable door 16 rests on the seat ring 11 under gravity action. The cover 13 could also rest directly on the seat ring 11 (FIG. 3) or, if it is not necessary that the cover 13 be closed when the cleaning box 15 is not operating, the cover 13 could remain open or it could even be omitted, together with the slidable door 16. At its rear end projecting into the cleaning box 15 the seat ring 11 is provided with two pins on its left side and two pins on its right side, these pins being in engagement with respective left and right guide rails 18.

The operation of the guide rails 18 is explained with reference to FIG. 3. When the seat ring 11 rests on the closet bowl 10, the two pins 17' and 17'' on each side of the seat ring are positioned in the upper ends of the respective guide rail 18, the upper portions of the guide rails being bifurcated. In this position the pin 17' rests in a branch 19 of the guide rail 18 whereas the pin 17'' rests in the vertical portion of guide rail 18. In order to ensure that the pins may be moved from this position only by applying a certain force, they may additionally be retained by a resilient clamping device. The two pins 17' define an axis about which the closet seat ring 11 can be turned up. The pins 17' and 17'' are preferably rotatably mounted in the seat ring 11 so as to reduce the friction occurring when they are moved along the guide rail.

For cleaning the closet seat ring 11 after use of the closet, the cover 13 is first opened by means of handle 14. Cover 13 is held in its open position by a stop means or a retaining means. Then the closet seat ring 11 is turned up about the axis defined by pins 17' by means of handle 12, until pins 17'' are lowered to the point where branch 19 bifurcates from the vertical portion of guide rail 18. Thereafter the seat ring 11 is pushed downwards until all four pins are in the vertical portion of guide rails 18. The seat ring 11 can then be released so that it falls into the cleaning box 15 under gravity action. If desired, it is also possible, of course, to guide seat ring 11 by holding handle 12 until the lowermost position is reached. The rear end surface of seat ring 11 may preferably be provided with a cushioning strip of rubber or the like for reducing the shock on impact.

It is not always necessary to first open the cover 13 by hand, if it rests on the closet seat ring 11 it will be opened automatically when the latter is turned up.

It would also be possible to turn seat ring 11 up automatically by means of a spring or a pulling cable actuated by a triggering device. This triggering device could in turn be actuated for example by a means detecting when the weight of a user is removed from the seat ring after use, or by the operation of a flushing handle or knob for flushing closet bowl 10 in usual manner.

The closet seat ring 11 in cleaning box 15 is held in a vertical position by the four guide pins which are located at positions indicated by reference numerals 20 and 21. Additional clamping devices may be provided for retaining the pins in these positions.

FIG. 4 diagrammatically depicts an optional device for pulling the closet seat 11 into the cleaning box 15. A pulling cable 22 is attached to the lowermost end of seat ring 11. Cable 22 runs over two rollers 23 and is tensioned by a helical spring 24. The seat ring 11, when it has been released, is automatically pulled into its end position by spring 24.

Before the starting of a cleaning operation cover 13 is closed manually or automatically. Cover 13 then contacts the upper end of the cleaning box via a sealing strip 9 of rubber or the like for forming a water tight closure. Automatic closing of cover 13 may be brought about, for example, by a linkage operated by closet seat ring 11, when this reaches its lowermost position in cleaning box 15, for releasing a cover retaining device so that cover 13 drops into closed position. For ensuring the water tight closure between cover 13 and cleaning box 15 it may be desirable to provide on the cover a resilient hook 25 (FIGS. 5 and 6) which slides over the nose of seat ring 11 and engages therebelow when cover 13 closes. When seat ring 11 is in its lowermost position, cover 13 is pulled down by hook 25 so that rubber strip 9 resting on the rim of cleaning box 15 forms the desired tight closure.

The closet seat ring 11 falling into its lowermost end position can also, if desired, actuate a switch 26 (FIG. 5) for starting a closet bowl flushing operation, or for causing cover 13 to close and initiating the cleaning of the seating surface as described hereinafter and at the same time starting the flushing of the closet bowl. This cleaning and flushing can then be terminated automatically after a predetermined time.

The rear wall of the cleaning box 15 is disposed so as to leave ample room for a cleaning device. According to FIG. 6, tap water from an annular distributing line 27 is sprayed onto the closet seat ring 11 by way of suitable nozzles. It is possible, if desired, to first heat the water externally of the cleaning box by means of a heating device, or to take the water from a warm water conduit. Also, a detergent may be added to the water by appropriate means. The water leaves cleaning box 15 by way of a conduit 27a, for reasons of economy it can then additionally be used for flushing the closet bowl. After the cleaning described above the closet seat 11 is disinfected. This may be achieved for example by adding a disinfectant medium to the water which is sprayed onto the seat.

FIG. 7 shows a modified device for cleaning the closet seat ring by spraying water or other cleaning liquid onto it. The water emerges from tubular arms 28 having suitable nozzles. The arms 28 are rotatably mounted on the rear wall of the cleaning box 15, they are rotated by the reaction force of the water jets leaving the nozzles, in a manner which is known in lawn sprinklers. The cleaning effect may be enhanced by providing the ends of arms 28 with brushes 29. Particularly in this modification, where a stronger drive may be required, the arms 28 may also be rotated by means of a turbine 30. In this case water flows through the turbine 30 and at the same time through the arms 28 and through openings therein provided within the brushes 29. Similar constructions are known in devices for washing automobiles. The turbine 30 may continue to rotate the arm 28 after the flow of water therefrom has stopped, so that the brushes 29 then wipe the water from the closet seat ring 11. It is also possible to mount two rubber flaps behind the brushes. After washing,

the turbine 30 may then be driven in the reverse direction so that the rubber flaps are pressed against the seat ring 11 for wiping the water off it.

Drying of the seat ring 11 may be enhanced by adding to the water during the last phases of washing a drying agent, for example in the form of an alcohol. The water adhering to the seat ring 11 could also be removed or "shaken off" by vibrating the seat ring. Drying can be accelerated and/or supplemented, if desired, by the application of radiant heat. For this purpose, one or more annular heating elements may be provided in cleaning box 15.

On completion of the cleaning cycle, or before the next use of the closet, cover 13 is opened and seat ring 11 is gripped on handle 12 and raised. Before reaching the upper end of the guide rails, the seat ring is pulled forward so that pins 17' enter branches 19. When pins 17' reach the ends of branches 19, the seat ring 11 is turned down onto the closet bowl. During this turning the pins or rollers 17' turn about the rollers 17" until they reach the upper ends of the vertical branches of guide rails 18. Thereafter the closet arrangement is again ready for use.

It would not be desirable to have to pull the seat ring 11 out of its lowermost position in cleaning box 15 by hand. Therefore, the seat ring is raised somewhat by hook 25 when cover 13 is opened (FIG. 8).

It would also be possible to raise the seat ring 11 from its lowermost position by means of a pedal. Such a solution would be particularly useful in cases where the box 15 is deep enough so that the cover 13 could be omitted without danger of water spurting out of the box. In a further modification a spring could be provided which is compressed by the seat ring 11 falling into its lowermost position, and which is locked in the compressed state. This spring may then be released after cleaning for automatically raising the seat ring 11 somewhat. Finally a pulling cable and/or a motor could be used for raising the seat ring 11.

The closet seat ring 11 may be cleaned in a most simple and inexpensive way if all the above described operations are carried out by hand. However, partly or fully automatic operation is also possible. In a very simple embodiment actuation of a push button may release a predetermined quantity of cleaning water into box 15. In an improved embodiment, different push buttons may be used for controlling, for example, the supply of cold water, warm water, drying agent and/or disinfecting agent and for effecting wiping, vibration and/or radiant heating of the closet seat. Finally, in a still more sophisticated embodiment, all operations may be controlled and effected automatically by a programmed control unit and corresponding motors and drive arrangements. It is obvious that such a solution would be relatively expensive and require a comparatively large space.

FIGS. 9 to 13 illustrate an embodiment of the invention in which the cleaning box is disposed laterally of the closet bowl. This arrangement may be advantageous for the following reasons. Since the closet seat is turned about an axis parallel to its longitudinal extension, the height of the cleaning box must only be sufficient to receive the width of the closet seat. The height of the cleaning box can therefore be smaller than in the arrangement according to FIGS. 1 to 8. In existing toilets, where there is little free space behind the closet bowl, it is generally possible without difficulty to ar-

range a cleaning apparatus having a cleaning box laterally of the closet bowl.

FIG. 9 shows a diagrammatic plan view of a closet arrangement in its position immediately before or after use. A closet seat ring 31 which rests on a closet bowl (not visible in the drawing) is provided with a handle 32 on one side and with two lateral arms 33 on its other side. Each arm 33 carries on its end a sliding element in the form of a ball 34 which is disposed in a partly cut out hollow shaft 35. This shaft 35 extends horizontally through two vertical guide rails 36 in a cleaning box 37 which is shown without its cover in FIG. 9. A toothed wheel 38 is mounted on an end of shaft 35 outside cleaning box 37.

For cleaning the closet seat ring 31 after use of the closet, a hydraulic cylinder 43 (FIG. 13) is first actuated by the operation of a usual closet flushing device. In a manner described below, cylinder 43 turns hollow shaft 35 through 90°. This shaft, which is cut out within guide rails 36 as shown in FIG. 11, its wall extending below arms 33, raises these arms and also turns them through 90° so that seat ring 31 is turned into a vertical position. Arms 33 are bent as shown in FIG. 10, and therefore the seat ring 31 in its vertical position is disposed laterally of the guide rails 36, the arms 33 extending through slots 39 in the guide rails. Under the action of gravity the turned-up seat ring 31 falls vertically down into cleaning box 37 adjacent to guide rails 36. The seat ring is thereby guided by the balls 34 which slide downwards inside guide rails 36. In falling as described, seat ring 31 actuates a lever 40 which closes cover 42 of cleaning box 37 by means of a linkage 41 (FIG. 12). A helical spring 42a is disposed in cleaning box 37 so as to be compressed by the seat ring 31 reaching its lowermost position, a latch (not shown) being actuated at the same time for retaining seat ring 31 in this end position. The operation of this latch is detected by an electric switch which then starts an electronic program control unit for automatically effecting the cleaning (for example washing and drying) of seat ring 31. After completion of the cleaning the said latch is released, either automatically by the program control unit or manually by the next user who may for this purpose actuate a push button or a pedal or the like. Automatic release by the next user by means of an approach switch would also be possible. Spring 42a, on release of said latch, raises seat ring 31 somewhat. At the same time cover 42 is opened by a further spring (not shown). The next user can therefore easily grip handle 32 for pulling seat ring 31 vertically upwards and then turning it down through 90° onto the closet bowl whereupon the closet arrangement is again ready for use.

When, after use, the usual closet flushing device is actuated, water also flows into cylinder 43 (FIG. 13) which is mounted on the outside of a wall of cleaning box 37. A plunger 44, which is raised by the water flowing into cylinder 43, is connected to a toothed segment 46 by a link 45. This toothed segment 46 and the toothed wheel 38 meshing with it are therefore turned in the directions of the arrows in FIG. 13 so that the shaft 35 turns arms 33 and seat ring 32 through 90° as already described. After plunger 44 has reached its end position, a valve in a discharge conduit of cylinder 43 is opened so that shaft 35 can eventually be turned back into its starting position by a next user as described. A casing could of course be provided for cov-

ering toothed segment 46 and the drive means therefor. These drive means could comprise a motor, for example an electric motor, in place of cylinder 43 and plunger 44. Such a motor could be started by any suitable means, for example by the actuation of the closet flushing device as described, or by means of a switch that may be operated manually or automatically as soon as a user leaves the closet seat and thereby discharges it. Such a switch might then in turn automatically actuate the closet flushing device.

In a simplified cleaning arrangement the power drive means for turning the closet seat ring up after use could be omitted; it would then be necessary, of course, to manually turn the seat ring up after use, and drop it into the cleaning box.

The actual cleaning operation in cleaning box 37 can be carried out in the manner already described, by means of cold and/or warm water which is sprayed from nozzles, and if desired with the aid of rotating brushes. Disinfecting and drying agents may be added to the water. Air and/or radiant heat may be used for drying the closet seat ring.

In another possible modification an electric motor is provided for opening and closing the hinged cover of the cleaning box. In this modification the seat ring preferably is disposed in the cleaning box when the closet is not in use. The seat ring in its cleaning position rests on a vertically movable support member in the form of a horizontal bar which is guided in the cleaning box and whose two ends are connected to the cleaning box cover by connecting elements in the form of cables or chains, for example. A person who wants to use the closet pushes a button for starting the electric motor which then opens the cleaning box cover. The cables or chains attached to the cover act to raise somewhat the said bar and the seat ring resting thereon. From this raised position the seat ring may then conveniently be gripped by hand and moved into the position of use on the closet bowl. In this position of the seat ring a switch is actuated, for instance by one of the arms carrying the seat ring, for starting the electric motor in the reverse direction to close the cleaning box cover again. After use of the closet, and before starting the cleaning operations, the electric motor is again switched on for opening the cleaning box cover. This may be achieved automatically by the actuation of the closet flushing device, or as a first step of a program control unit which thereafter controls the cleaning operations. The hydraulic cylinder 43 then turns the closet seat ring up in the manner described, and from the swung-up position the seat ring drops into the cleaning position under the action of gravity, thereby pushing the aforesaid bar into its lowermost position. The cables or chains connected to this bar pull the cleaning box cover down to close it. After the cleaning, the seat ring remains in the cleaning position with the cleaning box cover closed.

FIGS. 14 to 16 illustrate a further closet arrangement with a cleaning box disposed behind the closet bowl and in which the seat ring is moved into and out of the cleaning box by mechanical means. The drive is derived from a pivotable closet bowl cover 51. A pulley 52 attached to cover 51 is connected by means of a belt 53 to a further pulley 54 so that the latter turns as cover 51 is swung up or down. Pulley 54 drives, by means of a toothed segment 66 attached to it, a toothed wheel 55. A link 56 is fixed to the toothed wheel 55 and is pivotable together with the same. The free or outer end

of link 56 is connected to the forward end portion of a closet seat ring 58 by means of a hinge joint 57. The rear end of seat ring 58 is provided on either side with a guide pin 59 projecting into a respective guide rail 60 for guiding the seat ring.

After use of the closet the cover 51 is in its swung-up position as shown in FIG. 15, and the cleaning box 62 is closed by a flap 61 which is urged into its closed position by a spring 63. Cover 51 is now swung down onto the closet bowl by means of a handle 64. During this movement of cover 51 a closet flushing device is actuated (by means not shown), and belt 53 is driven in the direction of the arrow in FIG. 14. Belt 53 and pulleys 52 and 54 may be provided with teeth or other suitable surface formations to prevent slipping. Toothed segment 66 which is provided on a portion of the circumference of pulley 54 now turns toothed wheel 55 together with link 56. Seat ring 58 is thereby raised and moved into the cleaning box. The force of spring 63 is overcome by the moving seat ring, and flap 61 is pushed downwards into the cleaning box. The shape of guide rails 60 is chosen so that seat ring 58 is securely guided into its cleaning position in cleaning box 62. The guide rails 60 start on both sides of seat ring 58 from a position adjacent the rear end of the position of use of the seat ring, and they extend into the cleaning box 62. These guide rails 60 and the wheels 52, 54 and 55 together with belt 53 are so designed relatively to each other that seat ring 58 reaches its cleaning position after a 40° rotation of cover 51. When cover 51 has been swung down by 40°, the last tooth of segment 66 disengages from toothed wheel 55 so that the latter is no longer driven. Seat ring 58 is retained in its cleaning position (FIG. 16) by a weight 67 adjustably mounted on link 56. On reaching this cleaning position, seat ring 58 actuates a switch 68 for starting the actual cleaning operations which may be controlled and effected in the manner already described. After the above mentioned initial turning of 40° cover 51 can be completely closed down onto the closet bowl (FIG. 16) without obstruction by seat ring 58. In this closed position cover 51 covers the closet bowl and at the same time closes cleaning box 62.

On completion of the cleaning operations, or before the next use, cover 51 is raised, and during this raising the above described movements take place in reverse directions, bringing seat ring 58 out of cleaning box 62 into the position of use. Weight 67 also serves to retain the seat ring in its position of use on the closet bowl.

What we claim is:

1. An arrangement for automatically cleaning a closet seating surface on a closet seat ring after use, comprising:

a cleaning box mounted adjacent to and substantially on the same level as a closet bowl and adapted to receive said seat ring;

two guide rails arranged for guiding said seat ring between a position of use on said closet bowl and a cleaning position in said cleaning box;

a supply conduit for the supply of a cleaning liquid into at least one distributing line for spraying this liquid onto said closet seat ring when the latter is in said cleaning box;

and a triggering device for starting the supply of cleaning liquid to said distributing line.

2. An arrangement as claimed in claim 1, wherein said cleaning box is provided with a cover carrying a

resilient hook engageable with said ring when the latter is in said cleaning position.

3. An arrangement as claimed in claim 1, wherein a pulling cable attached to said seat ring is provided for automatically pulling said seat ring into said cleaning box after use.

4. An arrangement as claimed in claim 1 and further comprising a dispenser device connected to said supply conduit for dispensing cleaning and disinfecting and drying agents into the liquid flowing through said supply conduit.

5. An arrangement as claimed in claim 1, wherein said distributing line comprises at least one rotatable arm with nozzle openings.

6. An arrangement as claimed in claim 5 and further comprising a turbine for driving said rotatable arm.

7. An arrangement as claimed in claim 5 and further comprising brushes carried on said rotatable arm.

8. An arrangement as claimed in claim 5 and further comprising rubber flaps pivotally carried on said rotatable arm.

9. An arrangement as claimed in claim 1 and further comprising at least one annular heating element disposed in said cleaning box.

10. An arrangement as claimed in claim 1 and further comprising a programmed control unit for starting and stopping the supply of cleaning liquid.

11. An arrangement as claimed in claim 10, wherein said control unit is also adapted to bring about movement of said seat ring from said position of use to said cleaning position.

12. An arrangement as claimed in claim 10 and further comprising a dispenser device connected to said supply conduit and controllable by said control unit for dispensing cleaning and disinfecting and drying agents into the liquid flowing through said supply conduit.

13. An arrangement as claimed in claim 10, wherein said distributing line comprises at least one rotatable arm having nozzle openings, and wherein drive means controllable by said control unit are provided for rotating said rotatable arm.

14. An arrangement as claimed in claim 10 and further comprising at least one heating element disposed in said cleaning box and controllable by said control unit.

15. An arrangement as claimed in claim 1 and further comprising a vibrator device arranged for vibrating said seat ring in said cleaning box.

16. An arrangement as claimed in claim 1, wherein said cleaning box is disposed laterally of said closet bowl on one side thereof, said guide rails are vertically disposed in said cleaning box and said seat ring is secured on two lateral carrying arms provided at their ends with sliding elements which are guided in said guide rails.

17. An arrangement as claimed in claim 16 and further comprising a hollow shaft having cut out portions for receiving said carrying arms and said sliding elements when said seat ring is in said position of use, said shaft being rotatable for turning said seat ring from said position of use into a vertical position.

18. An arrangement as claimed in claim 17 and further comprising a driving device for rotating said hollow shaft and means for starting said driving device automatically after use of the closet.

19. An arrangement as claimed in claim 18, wherein said starting means comprise a detector device for sens-



ing discharging of said seat ring in said position of use.

20. An arrangement as claimed in claim 18, wherein said starting means are adapted to be actuated by operation of a closet flushing device.

21. An arrangement as claimed in claim 18, wherein said hollow shaft carries a toothed wheel and wherein said driving device comprises a hydraulic cylinder and a plunger which is connected to a pivotable toothed segment meshing with said toothed wheel.

22. An arrangement as claimed in claim 16 and further comprising a member which is movably mounted in said cleaning box and which is connected to a hinged cover provided on said cleaning box, said member being displaceable by said seat ring falling into said cleaning box for closing said cover.

23. An arrangement as claimed in claim 16, wherein said triggering device comprises a detector element disposed in said cleaning box for detecting when said seat ring reaches said cleaning position.

24. An arrangement as claimed in claim 16 and further comprising a spring mounted in said cleaning box so as to be compressed by said seat ring falling into said cleaning position, retaining means for retaining said spring in a compressed condition, and releasing means for releasing said retaining means so that said spring raises said seat ring.

25. An arrangement as claimed in claim 16 and fur-

ther comprising a cover hinged on said cleaning box and releasable retaining means arranged for keeping said cover closed against the action of an opening spring.

26. An arrangement as claimed in claim 1 and further comprising a link pivotable about a fixed point at one end and pivotably connected to said seat ring at the other end, a pivotable cover for said closet bowl, and coupling means arranged for pivoting said link when said cover is pivoted, so as to move said seat ring from said position of use to said cleaning position and vice versa.

27. An arrangement as claimed in claim 26, wherein said coupling means comprise a toothed wheel connected to said link and a toothed segment connected to said cover, said toothed segment being in engagement with said toothed wheel as long as said cover is at least partly opened.

28. An arrangement as claimed in claim 16 and further comprising a cover hinged on said cleaning box and an electric motor arranged for opening and closing said cover.

29. An arrangement as claimed in claim 28 and further comprising a vertically movable support member guided in said cleaning box for supporting said seat ring, and at least one connecting element connecting said support member with said cover.

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