March 11, 1958 A. BOFFA 2,826,208

MACHINE FOR EMPTYING, WASHING, RINSING AND DISINFECTING BED-PANS

Filed May 5, 1955 2 Sheets-Sheet 1

Fig. 3

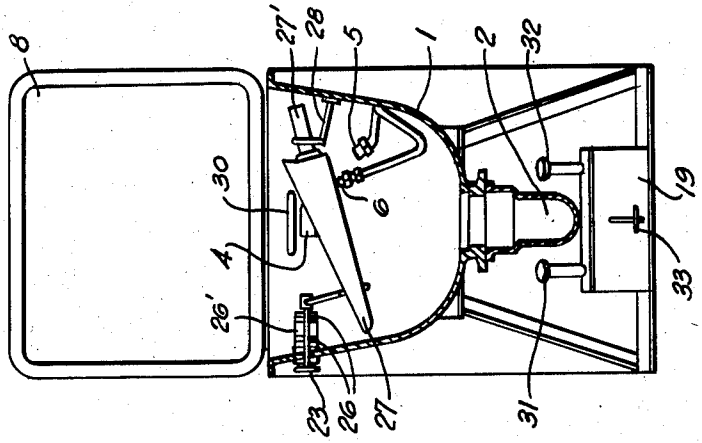


Fig. 2

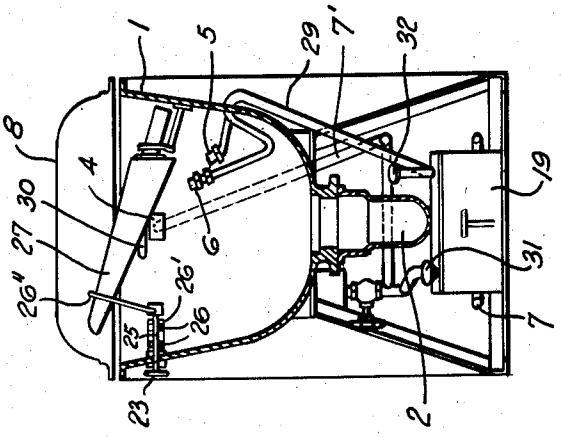
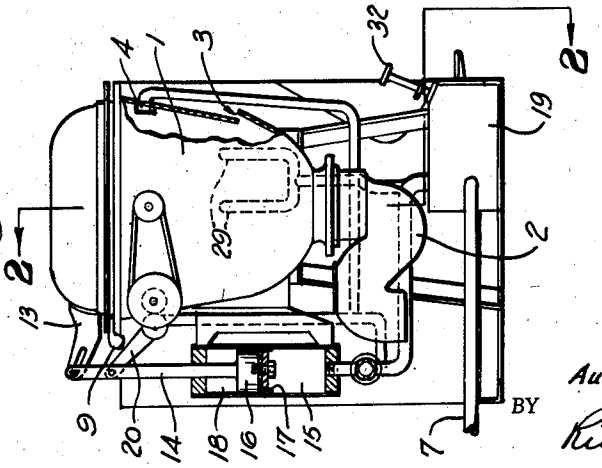


Fig. 1



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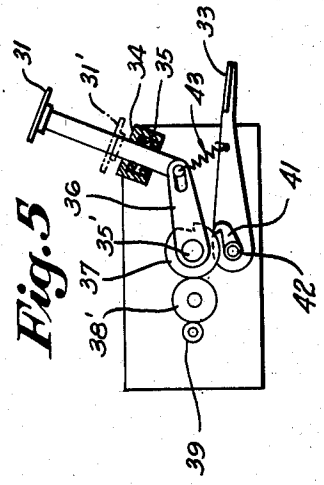


Fig. 5

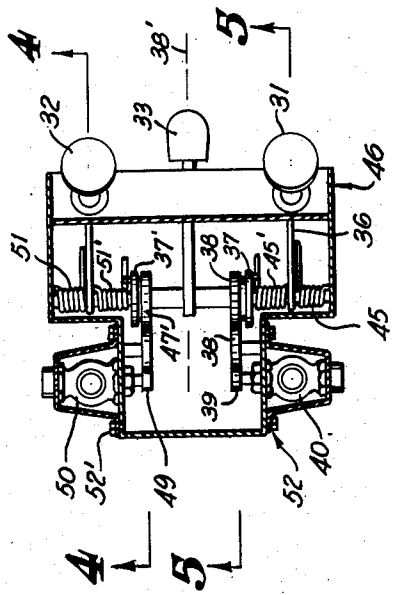


Fig. 7

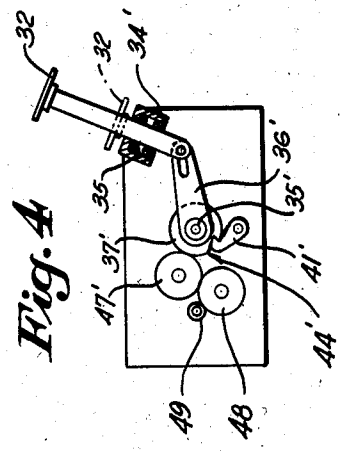


Fig. 4

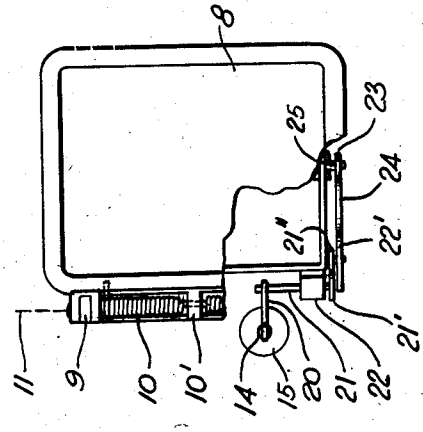


Fig. 6

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2,826,208

MACHINE FOR EMPTYING, WASHING, RINSING, AND DISINFECTING BED-PANS

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Application May 5, 1955, Serial No. 506,249

1 Claim. (Cl. 134—141)

This invention relates to a machine for emptying, washing, rinsing and disinfecting bed-pans and urinals for patients, chamber utensils and basins in general.

It is an object of the present invention to provide a machine for replacing manual work hitherto performed by attendants in hospitals, clinics, sanatoria and the like, which is disgusting and involves the danger of propagating contagious diseases.

It is in particular an object of the invention to provide a machine in which all the operations necessary for obtaining perfect cleaning of bedpans, urinals and the like, are controlled exclusively by means of pedals, so that the attendant personnel do not have to use their hands, which might be infected, to touch any part of the machine.

The invention is illustrated by way of example in the accompanying drawings, which represent one embodiment of the machine according to the invention. In said drawings:

Fig. 1 is a left hand side view of the machine with its cover closed and partly in section to show the control device of the cover;

Fig. 2 is a vertical sectional front view of the machine with its cover closed;

Fig. 3 is a section like that of Fig. 2 but with the machine cover open;

Figures 4 and 5 illustrate two pedal control devices;

Fig. 6 shows the structure and operating of the cover in top view partly in section;

Fig. 7 shows the pedal box in top view.

Operation of the machine is as follows:

(1) At the time of introducing the pan, the machine is in the position of Fig. 3; the cover 8 is open; the pedals 31 and 32 are lifted; the pan-carrying shaft is directed downwards.

(2) The terminal portion of the pan is simply introduced into the special support 26 and the handle of the pan is accommodated in the fork 28.

(3) While the pedal 31 is lifted, that is, if the cover 8 is open, the pedal 32 is locked in its elevated position.

(4) On pressing the pedal 31, which remains locked at the end of its stroke, the cock 40 is actuated to open it, which puts the hydraulic jack 15 and the jets 4 in communication with the water supply main; the hydraulic jack causes closing of the cover with a rapidity adjustable within wide limits, and also causes the rotation of the pan; the jets form a continuous layer of current water which keeps the inner walls of the bin clean by removing the materials that fall thereinto owing to the inversion of the pan.

(5) Only when the cover 8 (the pedal 31 being locked at the end of its stroke) is closed, it is possible to depress the pedal 32. The jet issuing from the nozzle 5 washes the interior of the pan perfectly. The jet from the nozzle 6 hits the inner face of the cover and falls back by way of a spray which also washes the outside of the pan. When the operator's foot is withdrawn from the pedal 32, the latter is brought back to its rest position (completely

lifted) by the springs 51 and 51' and the jets 5 and 6 are discontinued.

(6) When the pan has been cleansed, the foot is withdrawn from the pedal 32 and the small pedal 33 should be depressed. On depressing the latter, the pedal 31 is unlocked and the springs 45 and 45' take it again to its rest position (lifted), at which time the lock 32 is restored.

With the lifting of the pedal 31, the jets 4 are discontinued and the feed to the jack 15 is closed; the springs coaxial with the hinges 9 which have been loaded by closing the cover, cause the gradual opening of said cover and the corresponding rotation of the pan; and the water enclosed in the jack is discharged through the jets 4 as already explained.

(7) The pan can be taken out and the complete cycle of operation thus is concluded (Fig. 3).

The structure of the machine according to the invention comprises:

A bin 1 for collecting the solid and liquid materials contained in the pans, urinals and the like, said bin being equipped with a syphon 2 for conveying them to the sewer, as well as with an overflow aperture 3.

The latter serves for the purpose of preventing the washing nozzles 4, 5 and 6, connected to the piping 7 of the water feed main, from coming into communication with the sewerage in case the said syphon should become clogged.

The device has a cover 8 mounted on hinges 9. In particular, in Fig. 6 there are visible hinges 9 and two helical springs 10 (coaxial with the axis of rotation 11 of the cover). One of the ends of each of the springs is anchored in the central support 10'; the other end has its seat under the cover 8 and is, of course, free to move so as to enable the spring to be tightened. The two springs become loaded when the cover 8 is closed; if the force holding the cover closed is removed, the springs take the cover back to its starting position, which is the completely open position.

To the cover 8 there is rigidly connected the lever 13 (Fig. 1), which is coupled mechanically with the stem 14 of the hydraulic jack 15.

There is provided a hydraulic jack 15 constituted by a piston 16 provided with leather gasket 17 ensuring seal tightness with the stem 14 of the piston. A small hollow lead cylinder 18 acts as a counterweight. The jack is connected to the water feed main by means of a pipe 7. By acting upon a cock 40 (Fig. 7) contained in the pedal box 19, on opening cock 40, the main water pressure causes a thrust upon the piston 16 lifting said piston, which in turn lifts the stem 14 and causes the rotation of the lever 13. This causes the rotation of the cover 8 about the axis 11 until said cover closes completely. The stem 14 in rising causes also a rotation by about 80° of the lever 20, which starts movement of the mechanism hereinafter described.

Such mechanism is formed by a lever 20 welded to a shaft 21 (Fig. 6) which turns in a support 22. The mechanism has gears 21', 21'', which have the task of reversing the sense of revolution of the shaft 21, and toothed wheels 22' and 23 connected by the chain 24. Rotation of the shaft 21 is thus transmitted to the shaft 25, which is connected by means of a key to the toothed wheel 23.

The number of teeth of the wheels 22 and 23 is such as to make the shaft 25 turn by 180°.

A shaft 25 is mounted on two ball bearings 26 (Fig. 2) in the support 26'. The shaft carries at one end the toothed wheel 23 and at its other end a fork 26'' into which there is inserted the tip of the pan 27 to be emptied. When the pressure of the water feed main acts upon the piston 16, the stem 14 rises to close the cover 8 by means

of the lever 13, rotating the lever 20 and starting the movement of the train of mechanism hereinbefore described, to the wheel 23 and shaft 25, and thereby rotating the fork 26'' by 180°, causing the inversion of the pan 27 (position of Fig. 2).

The handle of the pan 27 rests on the fork-shaped support 28 fixed to the right-hand wall of the machine. Nozzles 4 feed through cock 40 of the water supply main by way of the pipe 7 (Figures 1–7). These nozzles have the function of washing uniformly the inner walls of the bin 1, forming thereover a continuous layer of water in very rapid flow; they also have the task of discharging the water contained in the cylinder 15 if the cock 40 is closed. In fact, when the cock 40 is closed, the water contained in the cylinder is put in communication with the outside (atmosphere) through the pipe 7' and the nozzles 4. As a result the pressure which had loaded the springs 10 and had closed the cover 8 is relieved.

After water contained in the cylinder 15 has been discharged through the nozzles 4, the piston reaches the bottom of the cylinder, in which position the cover is completely opened again. The pan 27 having now returned to its initial position (as illustrated in Fig. 3), may be extracted from the machine.

A nozzle 5 (Fig. 2) serves to wash the pans, basins, pots and the like. If the cock 50 (Fig. 7) contained in the pedal box is open, this nozzle is put in communcation with a hot water tank through pipe 29.

A nozzle 6 (Fig. 2) serves to wash urinals or else it projects its jet to hit the cover roof, and in dropping back, the water washes the external portions of the pan.

An aperture 30 serves to convey the foul air into a special vent stack.

Figures 4, 5, 7 show diagrammatically the components of box 19 for the pedal controls and make their operation clear. There are provided three pedals 31, 32, 33. The pedal 31 reciprocates in the guide 34, which has four rolls 35, and is coupled by crank and slotted link with the lever 36 which consequently turns about the shaft 35'. This rotates the wheel 3, which is notched, the gear 38 connected with the wheels 37, 38' and 39 and, therefore, the cock 40 which is thus opened to admit water into the hydraulic cylinder 15 and into the nozzles 4.

When the pedal 31 has arrived at its end of stroke at bottom (position 31' represented by dotted lines in Fig. 5), the pawl 41, connected to the pedal 33 and rotating about the shaft 42, is pushed by the spring 45 into the notch 44 of the wheel 37 and remains locked therein. It may be unlocked by depressing the pedal 33, which rotates the pawl 41 to disengage it from the notch 44, thereby disengaging the pedal 31, which is thereupon lifted up to its starting (upper) position by the two springs 45 and 45'. Such springs on one side are hooked to the lever 36 and on the other side are anchored respectively in the plate 46 and about the shaft 42. The pedal 32 (Fig. 4) descends gliding on rolls in the guide 34', which is similar to the guide 34. Pedal 32 is coupled by crank and slotted link to the lever 36', which rotates about the axis 35' thereby rotating the wheel 37', provided with a notch 44', the gear 47', connected to the wheels 37', 48, 49, and, consequently, the cock 50 which opens, thus delivering water to the jets 5 and 6.

Pedal 32 cannot be lowered if the pedal 31 is lifted, because the tooth 41', which is rigidly connected to the tooth 41 and to the pedal 33, engages the notch 44', preventing the rotation of the wheel 37' and, therefore, preventing the lowering of the pedal 32 (as in Fig. 4). If the pedal 31 is locked at end of stroke (position 31') and, therefore the tooth 41 is engaged in the notch 44, the tooth 41' will have rotated by the same angle (being rigidly connected as said to the tooth 41), thereby disengaging the wheel 37' and also the pedal 32. If the foot is withdrawn from the pedal 32, the latter is brought back to its rest position (entirely lifted as in Figure 4 at 32) by the two springs 51 and 51' which are connected similarly to the springs 45 and 45'; the cock 50 then closes and delivery from the nozzles 5 and 6 ceases.

The cocks 40 and 50 can be easily removed for repair if needed. It is necessary only to unscrew the bolts 52 and 52' and to extract the cocks with their respective supports and gears 39 and 49. As above stated, if the pedal 33 is depressed, the pedal 31 is disengaged and rises if the cock 40 is closed and the pedal 32 is locked in entirely lifted position; as the cock 40 closes, discharge from the jets 4 is discontinued and pressure is removed from the cylinder 15. The springs 10 then lower the piston 16, thereby reopening the cover 8 and rotating the shaft 25 and the pan 27 as described hereinbefore.

I claim:

A machine for emptying, rinsing and disinfecting bedpans, chamber utensils and the like, which comprises a vessel, a pedal-operated cover for said vessel, means for locking said cover in open position while the machine is at rest, means within said vessel for tiltably supporting the utensil to be washed and accessible to allow introduction of said utensil without touching the machine, means for providing jets of water from an external water supply source to flood said utensil as well as the ceiling of the cover and the walls of the vessel, and pedal actuated control means for rotating said utensil together with the closing of the cover to overturn position and with the opening of the cover to restore a position of the utensil allowing extraction thereof without touching the machine, as well as for actuating said jets with the closing of the cover and stopping them with the opening of the cover, said pedal actuated control means comprising one first pedal operable while the machine is open in rest position; a hydraulic cylinder and piston actuated by said first pedal and adapted on actuating to successively close said cover and open said jets as well as to overturn said utensil; said machine including means for locking said first pedal at its end of stroke and contemporaneously unlocking a second pedal provided for actuating means supplying said jets with water, said jets being provided by at least one first nozzle for washing the inside of the utensil and at least one second nozzle for washing the outside of the utensil; means for returning said second pedal to its starting position when the pressure exerted thereon for actuation is released, and means for interlocking said first and second pedal when said second pedal has returned to its starting position; a third pedal operable for actuation of the means provided for unlocking said first pedal and returning said first pedal to its starting position, for stopping the water jets, for returning the utensil to its previous position suited for extraction thereof, and for opening the cover; and means for discharging matter and water from said vessel.

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