Oct. 10, 1950 H. B. LEIDY 2,525,492

COUNTERBALANCED SANITARY TOILET SEAT

Filed Dec. 27, 1947 2 Sheets-Sheet 1

Fig. 1.

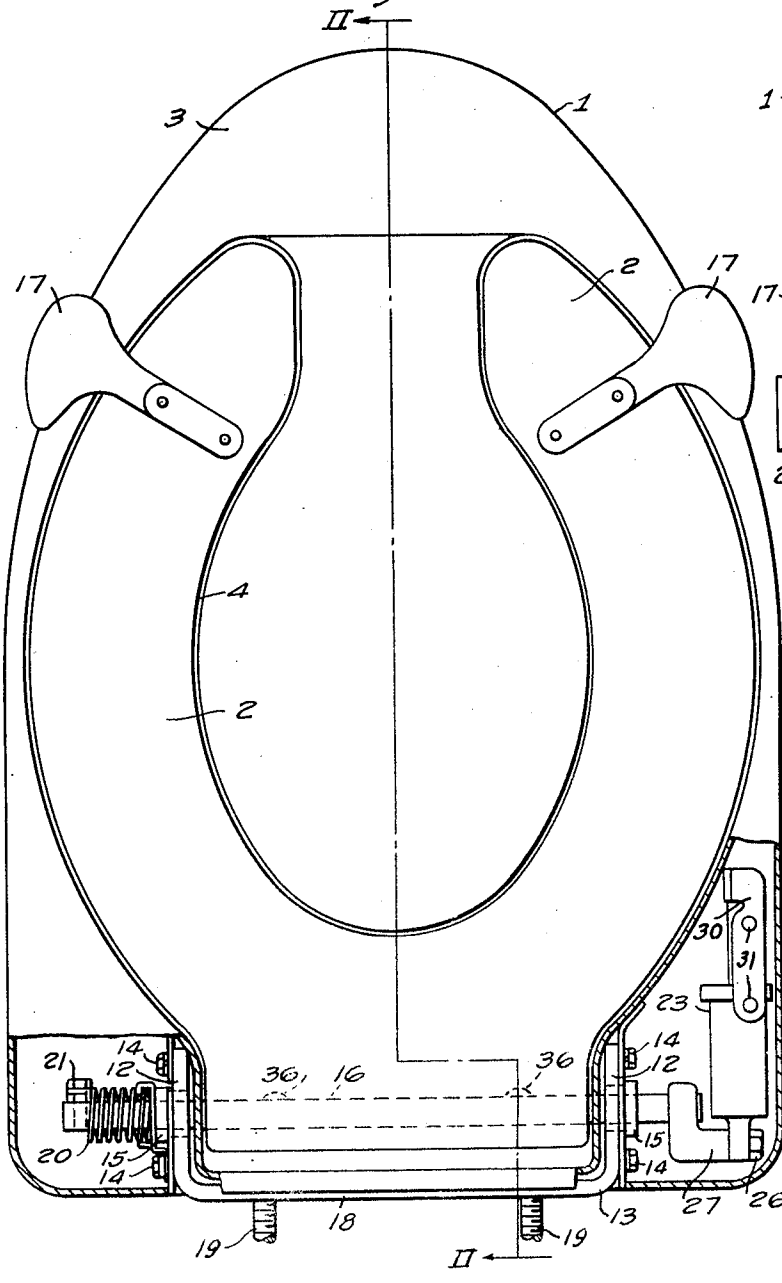
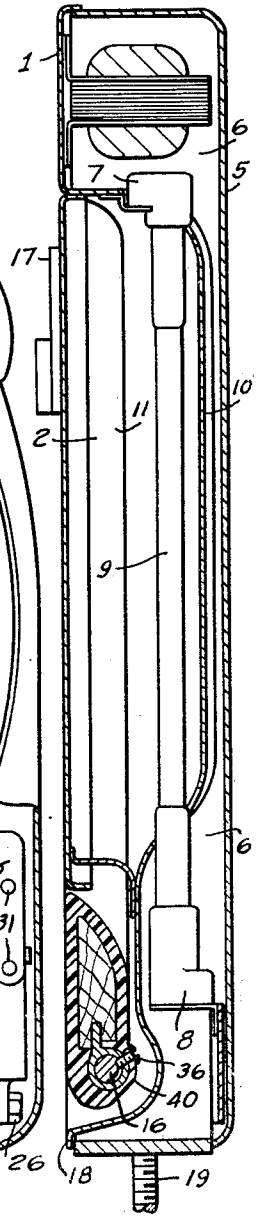


Fig. 2.



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Fig. 3.

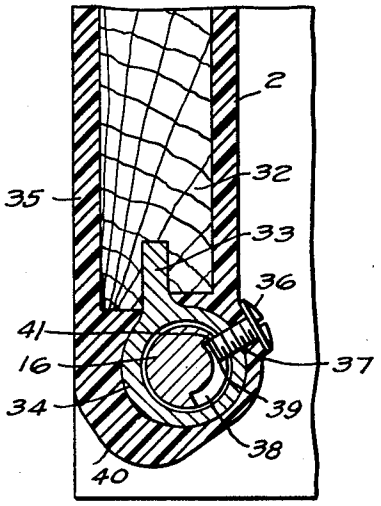


Fig. 4.

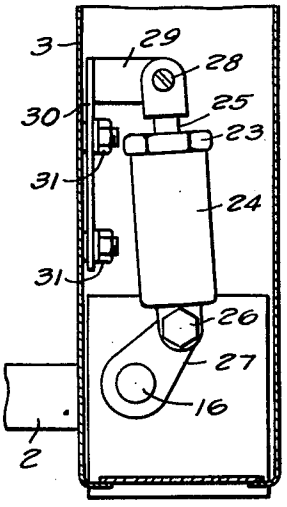


Fig. 5.

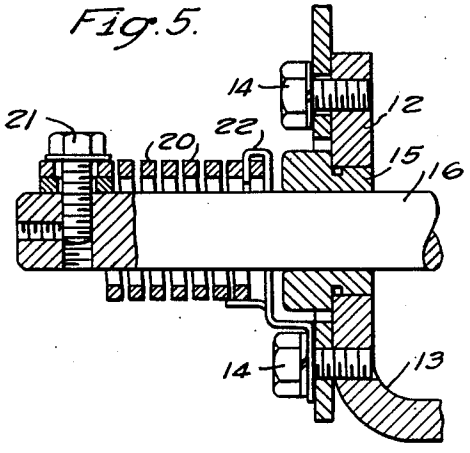
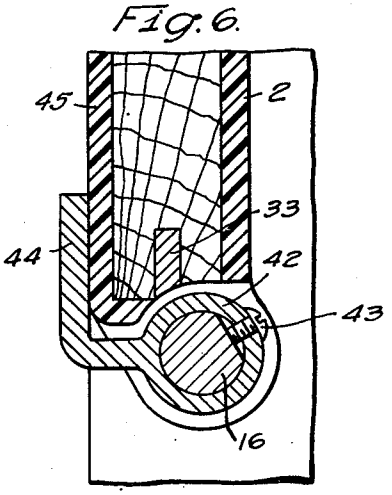


Fig. 6.



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UNITED STATES PATENT OFFICE

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COUNTERBALANCED SANITARY TOILET SEAT

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Application December 27, 1947, Serial No. 794,161

3 Claims. (Cl. 4—241)

1

This invention relates, as indicated, to a sanitary toilet seat and, more particularly, to a toilet seat of the type in which a germicidal lamp is employed for sterilizing the seat.

In one form of conventional sterile toilet seat now obtainable, there is provided a sheet-metal housing containing a sterilizing lamp which is turned on when the seat is in a vertical position and is turned out when the seat is moved to a horizontal position. The housing is in the nature of a container for the seat and is provided with a reflector by which sterilizing rays from the lamp are reflected to the surface of the toilet seat. This housing is provided with seat operating mechanism which includes a biasing spring for moving the seat to a vertical position and a dashpot for limiting the speed at which the seat is returned to its vertical position. The dashpot is connected between one of the sheet-metal walls of the container housing and one of the operating parts of the seat mounting. With the dashpot mounted in this manner, manual assistance in the returning of the seat to its vertical position is sometimes effective to damage the sheet-metal of the container housing to which the dashpot is connected.

One of the principal objects of this invention is to provide an improved mounting for a sanitary seat of the character described in which manual return of the seat to its vertical position is ineffective to damage the housing for the seat.

A further object of this invention is to provide an improved dashpot retarded spring actuated seat operating mechanism by which the manual return of the seat to a vertical position within a sterile housing may be accomplished independently of the spring operating mechanism and independently of the retarding action provided by the dashpot.

A still further object of the invention is to provide a sterile seat unit of the character described with an overrunning type of connection between the seat and a spring biased operating member by which manual movement of the seat to a horizontal position is effective to tension the spring biased operating member and which will allow the seat to be returned to a vertical position independently of the operation of the biasing member.

Other objects and advantages of the invention will become apparent from the following description.

In the drawings there is shown a preferred embodiment of this invention. In this showing:

Figure 1 is a front elevational view of a sterilizing toilet seat unit, a portion of the housing for

2

the seat being broken away to show the mechanism by which the seat is returned to its vertical position;

Fig. 2 is a sectional view, taken substantially along the line II—II of Fig. 1;

Fig. 3 is a broken away and enlarged view of a portion of the seat mounting structure shown in Fig. 2;

Fig. 4 is a partially broken away and enlarged side elevational view taken from the right of Fig. 1 which illustrates the dashpot mounting;

Fig. 5 is a partial sectional view showing the seat supporting and operating shaft together with its biasing spring; and

Fig. 6 is a sectional view similar to Fig. 3 illustrating a modified form of the invention.

Referring to Fig. 1 of the drawings, the numeral 1 designates a sheet-metal housing for a toilet seat 2. The housing 1 is provided with a front face 3 having an opening 4 in which the seat 2 is receivable when it is moved to its vertical unused position. As best shown in Fig. 2, the front face 3 of the housing 1 is separated from its back face 5 to provide a space 6 for wiring and sockets 7 and 8 for a sterilizing lamp 9. The housing 1 is provided with a sheet-metal reflector 10 positioned between the lamp 9 and back face 5 which is formed in such manner that the sterilizing rays from the lamp 9 are reflected thereby to the body engaging surface 11 of the seat 2.

The housing 1 is secured to vertical arms 12 of a bracket 13 by bolts 14. The arms 12 are provided with brass bearings 15 in which a shaft 16 is rotatably supported. The seat 2 is rotatably supported by the shaft 16 for manual movement by handles 17 from its vertical position, as shown in Figs. 1 and 2, to a horizontal position in a manner to be described. The horizontal part 18 of the bracket 13 is provided with slotted openings (not shown) for the reception of carriage bolts 19 by which the seat 2 and its sterilizing housing 1 may be secured as a unit to a toilet bowl.

The shaft 16 is provided with a spiral spring 20 for providing a rotational bias thereon in a clockwise direction as viewed in Fig. 2. As best shown in Fig. 5, the spiral spring 20 has one of its ends secured by a bolt 21 to the shaft 16 and its other end secured to an anchor 22 which is fastened by one of the bolts 14 to the bracket 13. The spring 20 is initially secured so that its tension will be effective to hold the seat 2 in its vertical position. When the seat 2 is moved to its horizontal position, the tension of the spring 20 and the biasing force exerted thereby on the shaft 16 will be increased.

A dashpot 23 is provided for retarding the rotational movement of the shaft 16 by the tension of its biasing spring 20. The dashpot 23 comprises a cylinder 24 having a piston (not shown) mounted therein and connected with a piston rod 25. As best shown in Fig. 4, the cylinder 24 is pivotally connected at 26 to a crank 27 which is secured to the shaft 16 for rotation therewith. The piston rod 25 has a pivotal connection at 28 to a member 29 projecting outwardly from a bracket member 30 which is secured to the face 3 of the housing 1 by a pair of fastening elements 31. The construction of the dashpot 23 is conventional and may be of any suitable type operative to permit free rotational movement of the shaft 16 in one direction when the seat 2 is being lowered, and to retard its movement in an opposite direction when it operates to return the seat to a vertical position.

The parts thus far described are conventional and were employed in sterile seat structures prior to this invention. However, in the prior art structures, the seat 2 was rigidly connected to the shaft 16 for movement therewith and rotation of the shaft 16 imparted tension to the spring 20 upon movement of the seat 2 to a horizontal position as indicated by the broken away portion in Fig. 4. After use, the tension in the spring 20 operated through the shaft 16 to return the seat 2 to a vertical position as shown in Fig. 1. This return movement was slowed down by the retarding action applied by the dashpot 23 to the shaft 16. The application of manual force to the handles 17 during the return of the seat 2 to its vertical position was transmitted by the linkage connections comprising the crank 27 and dashpot 23 directly to the bracket 30 to which the piston rod 25 is secured. It was thus possible to rip the fastening elements 30 from the sheet-metal forming the front face 3 of the housing 1 by the application of manual force to the handles 17 during the return of the seat 2 to its vertical position. The manual force applied to the handles 17 was thus transmitted directly to the sheet metal face 3 of the housing 1.

In order to prevent damage to the housing 1 by the application of manual force to the seat 2, the seat 2, in accordance with this invention, is journaled on the shaft 16 and there is provided an overrunning type of connection between the shaft 16 and the seat 2. As best shown in Figs. 2 and 3, the seat 2 comprises a core 32 constructed of wood to which is secured a brass insert 33 having an opening 34 therein for the reception of the shaft 16. The core 32 and its mounting insert 33 are provided with a covering 35 formed of any suitable material such as plastic. In the preferred embodiment of the invention, as shown in Figs. 2 and 3, the overrunning connection between the seat 2 and shaft 16 is provided by a pair of special tap screws 36 located at spaced points as indicated in Fig. 1. As best shown in Fig. 3, the brass insert 33 and its plastic covering 35 are provided with threaded openings 37 for the reception of the tap screws 36. Directly opposite each of the threaded openings 37, a slot 38 is milled in the shaft 16 over an angle of about 90°. When the tap screw 36 is mounted in the threaded opening 37, its end 39 extends into the slot 38. The length of the screw 36 is such that a small clearance 40 is provided between the bottom of the slot 38 and the end 39 of the screw 36.

With the seat 2 in a vertical position, the bias on the shaft 16, provided by the spring 20, will maintain the upper end of the slot 38 in engagement with the end 39 of the screw 36 as at 41.

The shaft bias is thus transmitted to the seat 2 and is operative to maintain the seat in its vertical position. When manual force is applied to the handles 17 to move the seat 2 to a horizontal position, the end 39 will maintain its engagement at 41 and rotate the shaft 16 against its bias. When the seat 2 is released after use, the bias on the shaft 16 will be effective to maintain the shaft 16 in engagement with the screw end 39 at 41 and to raise the seat automatically to its vertical position. As pointed out above, this return movement is retarded by the cushioning action of the dashpot 23. However, should manual force be applied to the seat 2 to assist its return movement to a vertical position, the screw end 39 is free to move ahead in the slot 38 and out of engagement with the end of the slot 38 as at 41. Since the slot 38 extends through an angle of approximately 90°, the seat 2 may be returned manually to its vertical position independently of the spring biased rotational movement of the shaft 16. It will also be noted that such return movement is independent of the retarding action provided by the dashpot 23. In this manner, the manual return of the seat 2 to its vertical position is rendered ineffective to damage the sheet metal face 3 of the housing 1.

In the modification shown in Fig. 6, the seat 2 is journaled on the shaft 16 for rotational movement independently of the movement of the shaft 16 as in the preferred embodiment shown in Fig. 3. In the modification shown in Fig. 6, a portion of the seat 2 and its brass insert 33 is cut away so that an operating member 42 may be secured to the shaft 16 for rotation therewith. The operating member 42 is secured to the shaft 16 by a set screw 43 and is provided with a flange 44 which is engageable with the bottom surface 45 of the seat 2 when the seat is in a vertical position. In this construction, pivotal movement of the seat 2 to a horizontal position is transmitted through the flange 44 to the shaft 16 as in the case of the preferred embodiment shown in Fig. 3. Upon release of the seat 2, the spring 20 will rotate the shaft 16 and operating member 42 in a clockwise direction, as viewed in Fig. 6, and the flange 44 will be effective to move the seat 2 to a vertical position. This movement will be retarded by the action of the dashpot 23 connected to the shaft 16 as described above. However, in the event that manual force is applied to the seat 2 during its return movement to its vertical position, the seat 2 is free to move out of engagement with the flange 44 and the manual force will not be transmitted through the dashpot 23 to the casing 1. The manual return of the seat 2 to its vertical position will thus be accomplished without damage to the casing 1.

In both modifications shown in Figs. 3 and 6, the seat 2 is journaled on the shaft 16 and the connection between the seat and shaft is effective to rotate the shaft when the seat is moved to its horizontal position. However, movement of the seat to its vertical position may be accomplished either manually independently of rotation of the shaft 16 or automatically through its connection with the shaft 16. Although two modifications of suitable connections between the seat 2 and shaft 16 have been illustrated, it will be understood that other connections can be made without departing from the principles of this invention.

Since numerous changes may be made in the above-described construction and different embodiments of the invention may be made without

departing from the spirit and scope thereof, it is intended that all matter contained in the foregoing description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim as my invention:

1. The combination comprising, a housing secured in vertical position at the back of a toilet bowl, a bearing mounted at the bottom of the housing, a shaft disposed for rotation in the bearing, a spring having one end fixed and the other end coupled to the shaft to cause said shaft to rotate, a toilet seat pivotally mounted on the shaft and movable from a vertical position to a horizontal position and back to its vertical position, said housing having a forwardly directed opening in which said seat is received upon movement of the seat from its horizontal position to its vertical position, a stop on the shaft, a stop on the toilet seat engaging the stop on the shaft, whereby movement of the seat from its vertical position to its horizontal position will cause rotation of said shaft against the bias of said spring, and release of the force causing rotation of the seat to its horizontal position or any force holding the seat in a horizontal position will cause said spring to reverse rotation of said shaft to cause said seat to return to its vertical position, but manual movement of the seat from its horizontal position to its vertical position will not transmit any torque to said shaft, a dashpot having connections with the shaft and the housing for limiting the speed of reverse rotation of said shaft by said spring, whereby the seat is automatically yet rather slowly moved to its vertical position into the opening of the housing.

2. In apparatus for controlling the operation of a toilet seat, in combination, a housing secured in vertical position at the back of a toilet bowl, a bearing mounted at the bottom of the housing, a shaft disposed for rotation in the bearing, a spring disposed about one end of the shaft having one end secured to the shaft and one end secured to the housing, a toilet seat pivotally mounted on said shaft, a stop on the shaft, an element on the seat abutting against the stop so that movement of the seat from its vertical position to its horizontal position causes force transmittal from

the seat to the shaft to cause said shaft to rotate in one direction, which may be designated the forward direction, against the bias of said spring and release of the operating force on the seat will cause said spring to rotate said shaft in the reverse direction to move the seat to its vertical position into the housing, but manual operation of the seat from its horizontal position to its vertical position does not transmit any torque to the shaft, and a dashpot coupled to the shaft and the housing for limiting the speed of reverse operation of said shaft.

3. In apparatus for controlling the operation of a toilet seat, in combination, a housing secured in vertical position at the back of a toilet bowl, a bearing mounted at the bottom of the housing, a shaft disposed for rotation in the bearing, a spring disposed about one end of the shaft having one end secured to the shaft and one end secured to the housing, a toilet seat pivotally mounted on said shaft, a dog rigidly secured to the shaft and engaging the bottom surface of the seat so that movement of the seat from its vertical position to its horizontal position causes force transmittal from the seat to the shaft to cause said shaft to rotate in one direction, which may be designated the forward direction, against the bias of said spring and release of the operating force on the seat will cause said spring to rotate said shaft in the reverse direction to move the seat to its vertical position into the housing, but manual operation of the seat from its horizontal position to its vertical position does not transmit any torque to the shaft, and a dashpot coupled to the shaft and the housing for limiting the speed of reverse operation of said shaft.

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