Oct. 24, 1944. G. H. PACKWOOD, JR 2,360,970

DISPENSER

Filed June 9, 1941

Fig. 1.

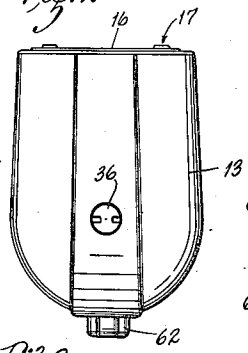


Fig. 3.

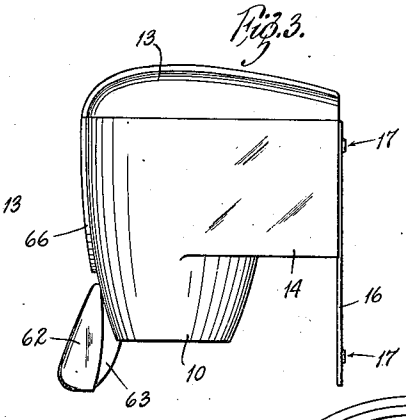


Fig. 2.

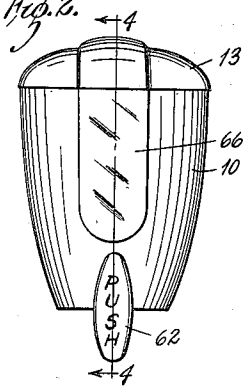


Fig. 5.

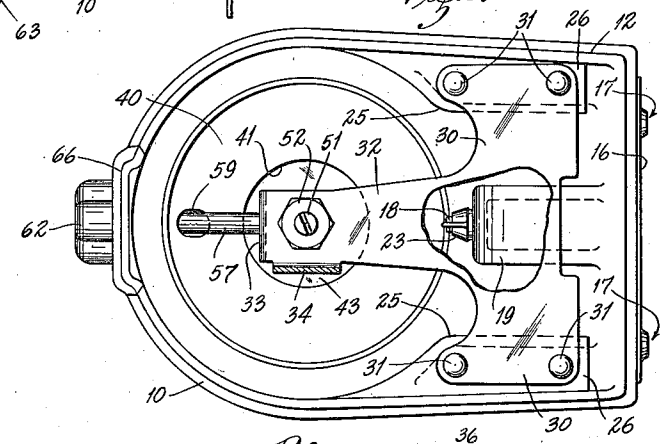


Fig. 4.

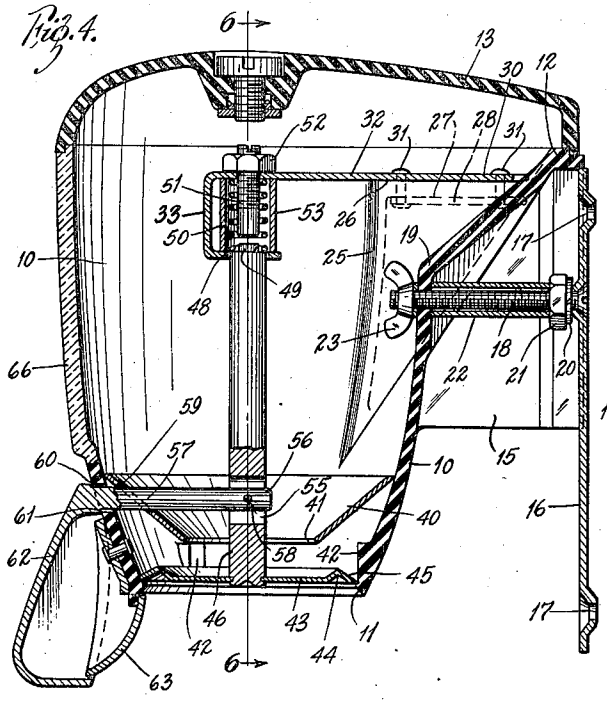
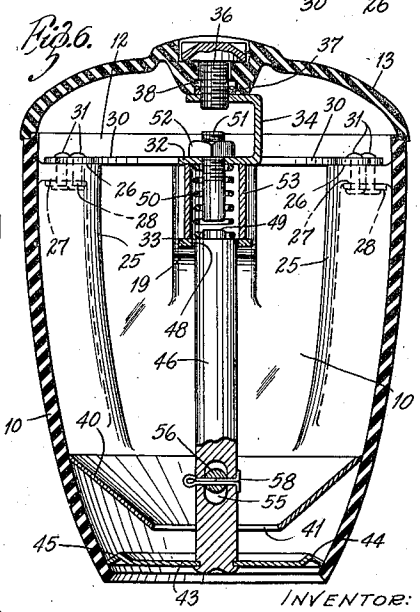


Fig. 6.



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DISPENSER

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Application June 9, 1941, Serial No. 397,158

9 Claims. (Cl. 222—161)

The present invention relates to a dispenser for finely divided material and, more particularly for powdered soap. Its uses are, of course, broader than merely the so-called powdered or finely divided soap, but for purposes of illustration it will be described in connection therewith.

Generally speaking, the dispenser includes a bowl with a removable cover thereon, an orifice in the bottom thereof, and with a valve controlling the orifice, the valve having a conveniently accessible operating handle for one hand operation of the dispenser.

It is an object of the invention to provide a novel type of valve for a controllable discharge.

It is a further object to provide such a combination which will prevent bleeding of the dispenser, and which will reduce packing at the valve.

A further object is to provide a construction which, in a simple manner, gains impact agitation with adjustability of discharge.

A further object includes a provision of a novel operating means for the valve, operable from the front of the bowl, by the heel of the hand, and so disposed that the palm of the hand may extend under the orifice.

A further object involves the provision of a novel attaching means whereby the dispenser may be secured to a wall, or the like.

In the drawing:

Fig. 1 is a plan view of the dispenser;

Fig. 2 is a front elevation;

Fig. 3 is a side elevation;

Fig. 4 is a vertical front-to-rear medial section taken on the line 4—4 of Fig. 2;

Fig. 5 is a top view with the cover removed and with a part broken away and a part in section; and,

Fig. 6 is a vertical side-to-side medial section on the line 6—6 of Fig. 4.

The dispenser includes a bowl 10, the walls of which taper toward the bottom and terminate in an orifice 11, and also have a flared extension 12 at the rear. The bowl has a cover 13 extending over the entire top. The cover 13 fits around a groove cut about the tapered edge of the bowl 10.

Two flanges 14 and 15 extend downwardly from the rear of the bowl 10 and below the flared portion 12. These flanges are spaced from the wall portions forming the flare 12. They are enlarged at their back edges, and are notched to receive edges of an attaching plate 16 having holes 17 to receive screws for fitting into the wall. There is a screw 18 extending from the plate 16 to within the dispenser bowl, passing through an indentation 19 outstanding from the back wall. A lock washer 20 and a locking nut 21 hold the screw 18 into the attaching plate 16. A spacer 22 is fitted between the nut 21 and the back wall of the bowl 10. A wing nut 23 inside the bowl then holds the bowl and the attaching plate 16 securely together by virtue of engaging against the vertical part of the indentation 19, and drawing the plate 16 against the flange 15.

Within the dispenser bowl, the walls at the rear are brought inwardly as at 25, on their outsides, the walls 25 extending in horizontal ledges 26 across to the flanges 14 and 15. The ledges have upper surfaces 27 below the upper edge of the bowl.

A bracket 30, generally T-shaped, spans the two surfaces 26 and is secured by brads 31 into the ledges 26, the brads engaging through the ledges and into back-up plates 28 below the ledges, between the walls 25 and the flanges 14 and 15.

The bracket 30 has a projecting portion 32 extending out over the axis of the bowl 10. A forward extension 33 of this bracket is turned down and in. A lateral extension 34 on the forward end of the bracket is turned up and over. These two extensions provide two overhanging portions disposed along the axis of the bowl.

The upper extension 34 is internally threaded to receive a cover locking screw 36. The screw 36 is held within the cover by a spring ring 37, and may be screwed into the bracket 34 for securing the cover to the bowl. Preferably the ring is disposed within an enlarged space 38, and below the upper end thereof, to provide some play, and to give freedom to movement of the screw when its head is engaged by a key.

The bracket 32 is used in connection with the valve which will now be described.

As previously stated, the walls of the bowl taper toward the orifice. Above the orifice there is a false bottom portion 40 which tapers downwardly and toward the axis of the bowl, and terminates in a circular opening 41. Beneath the false bottom 40, spaced guides 42 are located around the walls above the orifice 11. The inner edges of the guides 42 from a space slightly larger in diameter than the orifice.

A valve 43 engages the guides 42 and in its lower position seats against the tapered walls of the bowl just above the orifice. This valve preferably has an upstanding ridge 44 around its periphery giving it a sloping outer edge 45.

The valve is mounted on a plunger 46 of some mass to enhance its agitation qualities as will be

described. This plunger or valve stem is disposed axially of the bowl 10, extends through the opening 41 and through an opening 48 in the lower extension 33. On the top of the plunger 46 is a knob 49 to receive one end of a coil spring 50, which also surrounds an adjustable abutment screw 51 threaded down from the top of the bracket 30. A lock nut 52 holds the screw 51 in adjusted position. Between the extension 33 and the top of the main bracket 30, a sleeve 53 is provided so that soap is excluded from the agitation chamber which contains the head of the plunger, the spring, and the abutment screw.

Toward the bottom, the plunger 46 has a slot 55 therethrough, into which extends one end 56 of a bell crank operating lever 57. A pin 58 holds the lever 57 in the slot and provides a means for pivotally transmitting movement of the lever to the plunger. The end 56 passes through a hole 59 in the false bottom 40, below the top thereof, and through an opening 60 in the bowl 10, which also is below the upper edge of the false bottom.

The lever 57 has a shoulder 61 engaging over the edge of the bowl 10 formed at the outer end of the opening 60. This shoulder provides a fulcrum for the lever. The portion of the lever outside the bowl forms a push button 62 which is hollow and open at its rear side. It fits over a depending closure 63 secured to the lower end of the bowl 10. The button 62 telescopes with respect to the closure 63.

It is desirable that the relationship between the taper 45 and the taper of the lower end of the wall of the bowl be related so as to provide the bridging action of the soap referred to in co-pending application Serial No. 234,186, filed October 10, 1938, Patent 2,307,291, issued January 5, 1943. In this action, soap above the valve escapes around the valve when it is lifted, but the relative angles mentioned produce a crowding action which establishes an arch or bridge between the surface 45 and the tapered walls of the bowl, which prevents further egress of soap from the dispenser.

The bowl has a front panel 66 that may be formed separately of clear material and inserted by a tongue and groove therearound. By this means the clear panel may be used to give view of the contents of the bowl, even when the bowl is of opaque material.

In use, the cover of the dispenser may be removed by loosening the screw 36, and soap placed in suitable quantity up as far as the top edge of the bowl 10. This soap rests upon the false bottom 40 and flows through the opening 41 to rest on the upper surface of the valve 43. With the usual soap, the size of the opening 41 and the diameter of the ridge 44 is such that the soap will be disposed within the ridge when the valve is down and hence closed.

To dispense soap, the heel of the hand is pressed against the knob 62 with the palm of the hand below the orifice. The button is curved so as to fit against the heel of the hand and it depends below the orifice a sufficient distance to keep the cupped fingers from contacting with the bowl itself, but yet not far enough so that the soap may be spread beyond the hand. Likewise, the button 62 projects in front of the bowl just sufficiently to permit the palm to extend below the orifice.

Pressing the button as described lifts the plunger suddenly until it strikes the screw 51, which it does sharply owing to the fact that the spring 50 is weak relative to the normal hand force applied by a user. This sharp striking force agitates the entire contents of the bowl by virtue of the causing vibration of the bracket 30, which is transmitted to the walls of the bowl. This agitation is enhanced by a springing effect in the bracket, owing to its cantilever characteristics. This bracket is stiff rather than yieldable, however, giving a strong, high frequency vibration. The agitation breaks up packing of the soap within the dispenser.

As the valve 43 rises, the false bottom 40 causes ejection of soap from the upper surface of the valve over the ridge 44 and out of the orifice into the palm of the hand. The closure 63 prevents this soap from being deflected fortuitously into the button 62 or piling within the same in an unsanitary manner. Normally the valve 43 is not elevated sufficiently to contact the false bottom. The travel, however, is adjusted by turning the screw 51, and such adjustment varies the amount of discharge.

Upon release of the button 62, the plunger again falls, its mass and the spring 50 causing it to seat sharply to provide additional agitation of the contents of the bowl at the bottom. This further breaks up lumps and improves the flow of the soap back through the opening 41 and the top of the valve 43 for a subsequent operation.

In the event that a type of soap is used having a more gradual angle of repose on the valve 43, so that it flows over the ridge 44, the bridging action will occur in the manner described in the said copending application. When the valve is lifted, it becomes spaced from the side walls by a distance and provides an annular discharge opening. Forces acting upon the material above the wall are given a lateral component toward the valve, by the slope of the walls. The material above the valve also has a lateral force component, seeking to cause it to flow through the orifice. Such flow will occur when the valve is in motion, but when the valve is stopped by the limiting means, these lateral components are effective to cause an arching or bridging action. The slope of the walls is steep enough so that with the valve open, the distance between the valve and walls is small enough to enable these lateral force components to meet through the material to effect the bridging. The downward flare on the edge of the valve assists in the formation of the bridge, by producing a greater lateral component of force in opposition to that produced from the walls, to cause the bridge to be sooner and more readily formed. The amount of discharge is of course varied by varying the lift of the valve.

The false bottom 40 supports the weight of the head of soap above it, so that the mass of soap acting to break the bridge is only that below the false bottom and whatever may act laterally from the opening 41. This means prevents untimely breaking of the bridge and consequently bleeding of the dispenser. Where the valve moves a very short distance, as it does here, it is possible with some soaps to have a bleeding action with the valve open provided the bridge did not occur, particularly where the false bottom is some distance above the valve when the latter is up. It will be seen that normally the valve never strikes the false bottom.

Any soap escaping from the false bottom 40 through the opening 59 merely falls to the top of the valve, the bowl itself at that point comprising means to deflect the soap thus. The opening 60 through the bowl is not in direct contact with

soap, so that it does not cause a leakage problem.

It thus may be seen that a dispenser has been provided which attains the desired objectives in a compact and efficient manner.

What is claimed is:

1. In a dispenser, a bowl, a bottom within the bowl converging inwardly and downwardly, an opening through the bottom, a valve adapted to prevent flow through the opening and operable to permit flow therethrough, a lever connected with the valve and extending above the valve through the said bottom portion, fulcrum means for the lever on the bowl below the top of the said bottom portion, and means fixed to the bowl and extending above the opening in a direction to convey the material inwardly from above the opening to prevent escape of material from the dispenser through the opening in the bottom portion provided for the lever.

2. In a dispenser, a bowl having an orifice in the bottom thereof, valve means adapted to prevent egress of material from the orifice, a false bottom within the bowl above the valve, said false bottom extending inwardly and downwardly from the walls of the bowl and terminating in an opening above the valve, said false bottom member being adapted to support material above it, means for operating the valve comprising an operating member, an opening through the false member and below the top thereof through which the operating member passes, and an opening through the bowl through which said member passes, the opening through the false bottom member being spaced inward from the wall of the bowl to have its upper part inward from the innermost part of the opening in the bowl, so that material escaping therethrough remains in the bowl and is controlled by the valve.

3. In a dispenser, a bowl having an orifice at the bottom thereof, a valve controlling the flow of material through said orifice, means to operate the valve in a vertical direction, a plunger on the valve extending toward the top of the bowl, a bracket attached to the bowl said bracket having an attaching portion secured to the bowl and having a vibratable cantilever portion projecting from the attaching portion across the interior of the bowl to a point coaxial with the axis of the plunger, and limiting means on said cantilever portion against which the plunger may abut in one direction of travel of the valve to cause vibration thereof and agitation of the material, said limiting means being attached to the bowl only through said cantilever portion.

4. In a dispenser, a bowl having an orifice at the bottom thereof, a valve controlling the flow of material through said orifice, a plunger on the valve extending toward the top of the bowl, a bracket attached to the bowl said bracket having an attaching portion secured to the bowl and having a vibratable cantilever portion projecting from the attaching portion across the interior of the bowl to a point coaxial with the axis of the plunger, limiting means on said cantilever portion against which the plunger may in one direction of travel of the valve abut to be vibrated whereby to cause agitation of the material, said means being attached to the bowl only through said cantilever portion, and being adjustable so as to vary the stroke of the plunger.

5. In a dispenser, a bowl having an orifice therein, a valve for controlling the flow of material through the orifice, a plunger projecting toward the top of the bowl from the valve, a bracket secured in the bowl and extending over the plunger, an extension on the bracket bent to provide a second portion on the bracket extending across the axis of the plunger, and sealing means between said two portions of the bracket providing a sealing chamber, an opening in the bracket admitting the plunger to the chamber, a spring within the chamber and adapted to move the plunger, and abutment means on the bracket projecting into the chamber to limit movement of the plunger.

6. In a dispenser for finely divided material, a bowl having an opening in the bottom thereof, a valve reciprocable in said opening from a closing position in which material cannot escape through the opening, to an open position, the walls above the opening being at an acute angle to the vertical, and the valve being movable to an open position spaced a relatively short distance from said walls to provide a ring-like discharge space, the slope of the walls being such as to provide a component of force on the material laterally and inwardly toward the valve, the valve being adapted to provide a counter component of force, and the spacing between the valve and the walls being small enough to enable said forces to act through the material against each other and thereby to effect a bridging of the material above the top of the valve when the same is open, and means above the valve providing passage for material to the valve, but being adapted to support at least part of the material in the bowl to limit the head of the material acting downwardly to break the bridge.

7. In a dispenser for finely divided material, a bowl having an opening in the bottom thereof, a valve reciprocable in said opening from a closing position in which material cannot escape through the opening, to an open position, the walls above the opening being at an acute angle to the vertical, and the valve being movable to an open position spaced a relatively short distance from said walls to provide a ring-like discharge space, the slope of the walls being such as to provide a component of force on the material laterally and inwardly toward the valve, the valve being adapted to provide a counter component of force, and the spacing between the valve and the walls being small enough to enable said forces to act through the material against each other and thereby to effect a bridging of the material above the top of the valve when the same is open, and means above the valve providing passage for material to the valve, but being adapted to support at least part of the material in the bowl to limit the head of the material acting downwardly to break the bridge, said means comprising a false bottom member above the valve, extending from the walls of the bowl, and having a central opening therein over the valve.

8. In a dispenser, a bowl having an orifice in the bottom, a valve controlling flow through the orifice, the bowl having integrally formed horizontal ledges on opposite sides of a diameter above the bottom, a bracket having lateral portions extending over the ledges and secured thereto, and a medial extension between the lateral portions projecting outwardly in cantilever fashion over the orifice, said cantilever portion comprising means to limit movement of the valve.

9. In a dispenser, a bowl having an orifice in the bottom thereof, a false bottom member above said orifice and having an opening through which material may flow to the orifice, said false bottom member having a portion extending from the inner wall of the bowl downwardly and toward

the center of the bowl, a valve operable between the orifice in the bowl and the false bottom, an operating handle for the valve comprising a bell crank lever, an opening in the bowl through which one arm of the bell crank lever extends, an opening through the downwardly extending part of the false bottom member through which said one arm of the bell crank lever extends, the upper edge of said latter opening being spaced inwardly from the inner wall of the bowl, means connecting said one arm of the bell crank lever to the valve for operation thereof, the other arm of the bell crank lever extending downwardly outside the bowl and adjacent the same, and having its lower end spaced from the orifice substantially the distance from the heel of the hand to the middle thereof, whereby pressure of the heel of the hand on the lower end of the said other arm of the bell crank lever will rock the same to operate the valve to cause discharge of material into the hand.

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