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1,993,401

POWDERED SOAP DISPENSER

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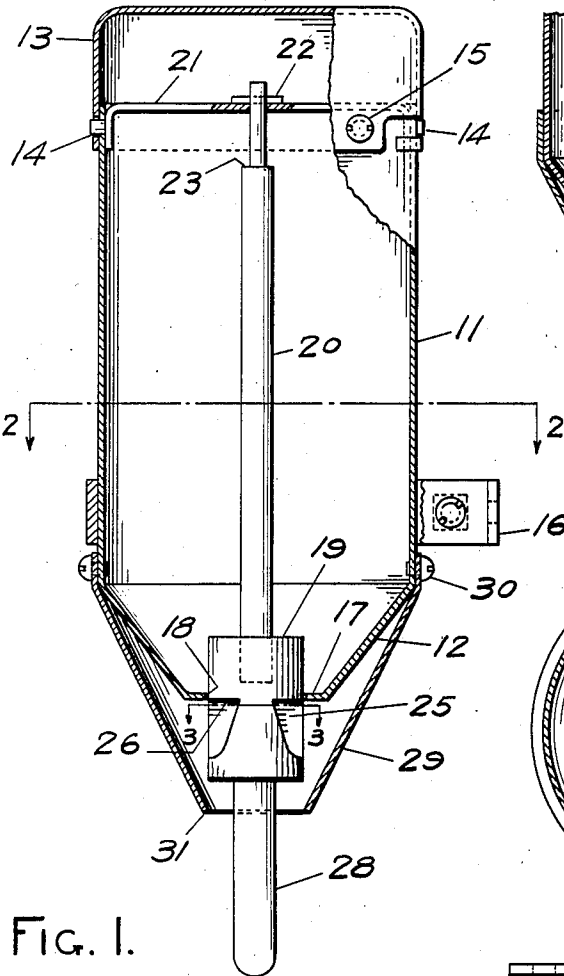


FIG. 1.

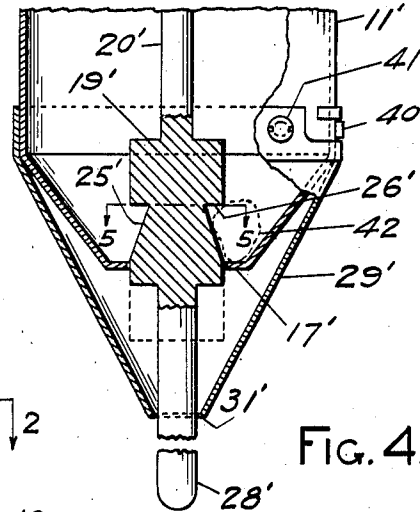


FIG. 4.

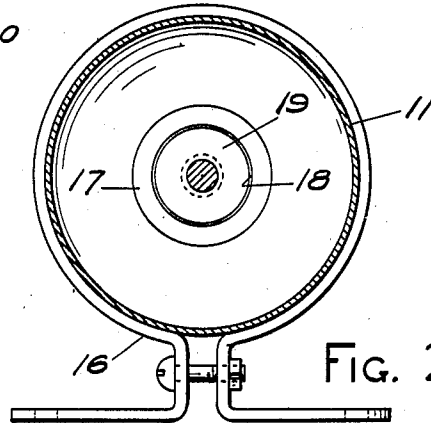


FIG. 2.

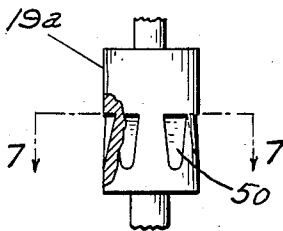


FIG. 6.

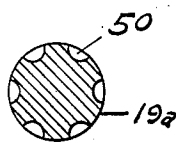


FIG. 7.

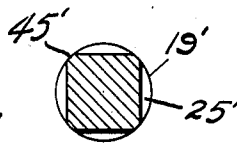


FIG. 5.

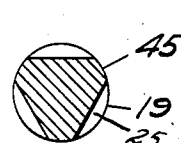


FIG. 3.

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1,993,401

POWDERED SOAP DISPENSER

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11 Claims. (Cl. 221—62)

This invention has to do in a general way with dispensing apparatus and is more particularly related to dispensers for powdered soap and the like such as are used in public lavatories, factory wash rooms, etc., and in which it is highly desirable that the powdered soap be delivered in a relatively small quantity, depending on a manual operation, into the same hand which effects the dispensing operation. I am aware of the fact that numerous dispensers have been designed with this general objective in mind and have met with varying degrees of success, depending upon their construction.

The soap dispenser contemplated by this invention is of the so-called "valve type" in that the discharge opening is normally closed by a body member which is adapted to receive longitudinal reciprocation from the user or operator. In prior devices of this same general construction, with which I am familiar, the body member which acts as a valve for closing the discharge opening has a conical or flanged surface which is normally adapted to rest in pressure bearing engagement with a seat formed about the discharge opening. When using a material such as soap which has a tendency to cake or agglomerate, especially under humid or moist conditions, it has been found in the operation of devices of this character the dispenser is soon rendered inoperative due to the building up or accumulation of material between the valve and its seat. This necessitates frequently emptying the container and cleaning the valve and seat before it can again be successfully operated and, for this reason, the so-called "valve type" of dispenser has never been considered satisfactory for use in connection with powdered soap. It therefore becomes a primary object of this invention to provide a soap dispenser of the general class described with a novel form of valve construction in which the closure of the discharge opening is not dependent upon the pressure engagement of a valve with a seat but is effected by means of a body which is freely slidable through the discharge opening and which, in the region normally contained in the discharge opening, is of substantially the same cross sectional size and shape as the opening. The body just referred to will be in the nature of an elongated cylinder when the discharge opening is circular.

It is a further object of this invention to provide a dispenser of the class described with means for roughly controlling the amount of material which is dispensed with each operation of the

valve or plunger. This object is accomplished by providing the valve or plunger body with notches or pockets positioned so as to be pushed up into the material in the container where such material caves or falls into the pockets and is withdrawn from the container when the plunger body is released. The pockets or notches are positioned at an intermediate point on the plunger body, and the travel of the plunger is limited so that a portion thereof below these notches occupies the discharge opening and is effective to close the same when the plunger is in its uppermost position.

In order to prevent the possibility of packing, such as might occur if the plunger member were working directly through an opening in a conical or tapered bottom, I provide the bottom of my container with a substantially flat portion which surrounds the discharge opening, and by forming the notches or pockets so that their inner surfaces are downwardly divergent, and terminate in substantially square shoulders at their upper ends, I have discovered that these square shoulders co-operate with this flat bottom surface to shear or crush any lumps which may be in the material in the container. The substantially square shoulders are further effective to positively withdraw all of the material contained in the pockets from the container and the downwardly divergent surfaces are effective to deliver all of such material from the notches or pockets into the hand of the user.

I consider it a still further feature of this invention that these pockets or notches are circumferentially arranged about the plunger so as to leave uninterrupted longitudinal lines or areas throughout the entire length of the plunger thereby providing a positive guide which prevents the plunger being swung to one side and held to permit the contents of the container being run out without manipulating the plunger.

The plunger in the dispenser contemplated by this invention is mounted upon or formed integrally with a stem which is suspended from a suitable support in the container and is provided with stop means to limit its longitudinal movement, such stop means being effective to give a distinct jarring action at each end of the movement whereby the pockets are effectively filled and emptied. I consider it a further feature of this invention to form the plunger of substantially greater cross sectional areas than the stem so as to provide a wide shoulder at the top of the plunger which I have found to be a most satisfactory means of agitating the material in the container

and assuring its free delivery in the notches or pockets.

The details in the construction of certain preferred forms of my invention, together with other objects attending its production, will be best understood from the following description of the accompanying drawing, which is chosen for illustrative purposes only, and in which

Fig. 1 is a vertical section with parts shown in outside elevation illustrating a preferred form of my invention;

Fig. 2 is a plan section taken in a plane represented by the line 2—2 of Fig. 1;

Fig. 3 is a plan section along the line 3—3 of Fig. 1;

Fig. 4 is a fragmentary section showing a slightly modified construction and illustrating the action of this improved type of valve plunger contemplated by this invention;

Fig. 5 is a plan section on the line 5—5 of Fig. 4;

Fig. 6 is a fragmentary elevation with parts broken away, showing a modified form of valve plunger; and

Fig. 7 is a plan section on the line 7—7 of Fig. 6. More particularly describing the invention as herein illustrated, reference numeral 11 indicates a container which has a bottom 12 and is provided with a cover cap 13. The cover cap 13 is shown as being securely locked in place upon the container through the medium of a bayonet lock 14 and a double slotted countersunk set screw 15. The container is adapted to be mounted upon a wall or other suitable support in any desired manner such as by means of the clamp and bracket assembly generally indicated by reference numeral 16. The bottom 12 of the container is shown as being conical or tapered in form and for the purpose pointed out hereinabove such bottom is provided with a substantially flat portion 17 which surrounds a discharge opening 18.

Reference numeral 19 indicates what I have termed a "valve plunger body" which is secured to or formed integrally with a stem 20, such stem having its upper end extending through an aperture in a cross-member 21, where it is provided with a pin or other suitable stop means indicated at 22, adapted to engage the cross member and suspend the plunger 19 so that it is normally positioned with an intermediate portion thereof occupying the discharge opening. The stem 20 is provided with a shoulder or other suitable stop 23 which is situated below the cross member 21 and is adapted to be raised into engagement with the cross member to limit the upward movement of the plunger and also to impart a distinct jarring action to the contents of the container when the plunger is operated. It will be observed that the plunger member 19 is made very much larger than the stem 20, thereby forming a substantial shoulder on the top of the plunger which, as has been pointed out above, is effective to materially agitate the contents of the container.

The plunger member 19, which in the case of a circular discharge opening, is in the nature of an elongated cylinder, is of a size such that it is freely slidable in the discharge opening and will at the same time be effective to close the same and prevent egress of the contents of the material when in its normal position.

For the purpose of delivering a small quantity of material from the container following an upward movement of the plunger, I provide the

plunger with a plurality of undercut notches or pockets, generally indicated by reference numeral 25. These pockets have downwardly divergent inner surfaces and terminate at their upper ends in shoulders 26 which are substantially square. The plunger is suspended so that the shoulders 26 fall in a plane below the upper edge of the discharge opening or lie in a position such that the discharge opening is effectively closed by the top portion of the plunger member. The length of the pockets or notches is preferably slightly less than the distance from the shoulder 23 to the bottom of the cross member 21 so that when the plunger is pushed into its uppermost position, where the shoulder 23 engages the cross member 21, the discharge opening is substantially closed by that portion of the plunger at or below the bottom pockets or the notches 25. From this construction it will be seen that no material can flow from the container as long as the plunger is held in its uppermost position, and when the plunger is released, the material contained within the notches 25 is substantially all that is carried from the container and delivered into the hand of the user. In operation the release of the plunger is followed by a distinct jarring action resulting from the pin 22 engaging the cross member 21, which assures a complete delivery of all the material from the pockets.

For the purpose of actuating the plunger member, I provide the same with another stem indicated at 28 which extends a substantial distance below the bottom of the plunger.

In order to prevent water being splashed against the surfaces of the plunger, or into the container when the plunger is being operated, I provide the container with a tapered false bottom 29 which is shown as being of conical shape and may be secured in any suitable manner such as by means of welding or screws 30 to the bottom portion of the container. This false bottom is provided with an opening 31 which, to facilitate removal of the plunger for cleaning purposes, is made of substantially the same diameter as the discharge opening 18. In this form of my invention the only operations necessary to remove the plunger are the removal of the cover cap 13 and the pin 22, after which the plunger can be withdrawn through the openings 18 and 31.

The form of my invention shown in Fig. 4 is the same in its general construction and operation to that just described in connection with Figs. 1 to 3, inclusive, and corresponding parts are indicated by the same reference numerals distinguished by the prime mark. In Fig. 4 I show the dispenser as being provided with a false bottom 29', the opening 31' of which is substantially smaller than the discharge opening of the dispenser body. In using this type of construction it is advisable to make the false bottom detachable and this may be done in various ways. In the form shown, I show the false bottom as being attached to the dispenser body through the medium of bayonet pin locks 40 and a double slotted set screw 41. Fig. 4 shows the plunger member 19' as having been moved into its uppermost position and clearly illustrates the manner in which the shoulder 26' and the flat bottom portion 17' will co-operate to shear or crush a lump of material such as is indicated in dotted lines by reference numeral 42.

It will be apparent from the illustrations and the foregoing description, that the quantity of material discharged with each manipulation of the plunger is roughly measured by the pockets

or notches and by varying the sizes of the plungers and the number and size of the notches the dispensers may be made to discharge various amounts of material. I have found in actual operation that the larger sizes of plungers have certain advantages over smaller plungers. In the first place, the greater weight obtained makes for a more positive operation; secondly, I am able to obtain a greater area in the shoulder 19 for the purpose of agitating the material; and, third, the notches or pockets do not need to be so deep to discharge a given amount of material so that the possibility of holding the plunger at an intermediate point and permitting the contents of the container to drain out is greatly reduced.

Figs. 3, 5, 6 and 7 illustrate various suggestive arrangements of notches which may be employed in the plunger member. Fig. 3 is a section of the plunger shown in Fig. 1 which has three notches cut on chords of the cross sectional circle and spaced apart so as to leave curved bearing areas 45 therebetween. These bearing areas 45, being in constant engagement with the discharge opening 18, when the notched portion of the plunger is passing therethrough, constitute guides for the plunger which prevent its being swung to one side as discussed in the early part of the specification. Fig. 5, which is a section of the plunger shown in Fig. 4, illustrates a construction having four notches 25' which, it will be noted, are not as deep as the notches 25 and leave bearing surfaces 45'.

In Figs. 6 and 7 I show a plunger construction which is provided with a relatively large number of narrow groove type notches or pockets, instead of a small number of wide notches. This type of construction may be found more desirable in extremely large plungers, where the notches of the type shown in Fig. 5, for example, would necessarily be quite deep and deliver a large quantity of material.

It will be apparent from the foregoing description that the device contemplated by this invention is of extremely simple construction, can be easily and quickly assembled, taken apart and cleaned, and it is substantially "fool proof" in its operation.

It is to be understood that while I have herein described and illustrated certain preferred forms of my invention, the invention is not limited to the precise construction explained above but includes within its scope whatever changes fairly come within the spirit of the appended claims.

I claim as my invention:

1. A dispenser for powdered soap and the like embodying: a container having a substantially flat wall surface surrounding an opening in its bottom; a plunger valve mounted for free longitudinal movement in said opening, said plunger valve being provided with downwardly divergent notches terminating in substantially square shoulders at their upper ends; means for supporting said valve against downward movement so that a portion thereof above said shoulders closes said opening when said valve is in its lowermost position; and means for limiting the upward movement of said valve so that said opening may be substantially closed by a portion of said valve body at the bottom of said notches when the valve is moved to its uppermost position.

2. A dispenser for powdered soap and the like embodying: a container having a substantially flat wall surface surrounding an opening in its bottom; a plunger valve mounted for free longitudinal

movement in said opening, said plunger valve being provided with downwardly divergent notches terminating in substantially square shoulders at their upper ends; means including a stem mounted on said valve for supporting said valve against downward movement so that a portion thereof above said shoulders closes said opening when said valve is in its lowermost position; and means for limiting the upward movement of said valve so that said opening may be substantially closed by a portion of said valve body at the bottom of said notches when the valve is moved to its uppermost position.

3. A dispenser for powdered soap and the like embodying: a container having a substantially flat wall surface surrounding an opening in its bottom; a plunger valve mounted for free longitudinal movement in said opening, said plunger valve being provided with downwardly divergent notches terminating in substantially square shoulders at their upper ends; means including a stem mounted on said valve for supporting said valve against downward movement so that a portion thereof above said shoulders closes said opening when said valve is in its lowermost position; and means comprising a shoulder on said stem and a stop in said container adapted to be engaged by said shoulder for limiting the upward movement of said valve so that said opening may be substantially closed by a portion of said valve body at the bottom of said notches when the valve is moved to its uppermost position.

4. A dispenser for powdered material embodying: a container having a substantially flat wall surface surrounding a discharge opening in its bottom; a substantially cylindrical plunger valve in said opening; means supporting said valve for longitudinal movement in said opening; and means associated with said support for limiting the movement of said plunger so that it is always contained within said opening, said plunger being provided with downwardly divergent notches terminating in substantially square shoulders at their upper ends and positioned so that said shoulders are below the upper edge of said bottom opening when said plunger is in its lowermost position.

5. A dispenser for powdered material embodying: a container having a substantially flat wall surface surrounding a discharge opening in its bottom; a substantially cylindrical plunger valve in said opening; means supporting said valve for longitudinal movement in said opening; and means associated with said support for limiting the movement of said plunger so that it is always contained within said opening, said plunger being provided with downwardly divergent notches terminating in substantially square shoulders at their upper ends and positioned so that said shoulders are below the upper edge of said bottom opening when said plunger is in its lowermost position, said notches being circumferentially arranged so as to leave uninterrupted guide surfaces throughout the length of said plunger.

6. A dispenser for powdered material embodying: a container having a bottom provided with a discharge opening; an elongated plunger body of slightly less diameter than said opening throughout its length whereby it is freely slidable through said opening and constitutes a closure therefor; a stem secured to the top of said plunger; and means in said container for supporting said stem so that the upper portion of

said plunger normally closes said opening, said plunger being provided with a plurality of downwardly divergent notches terminating at their upper ends in shoulders situated below the said upper portion of said body.

7. A dispenser for powdered material embodying: a container having a bottom provided with a discharge opening; an elongated plunger body of slightly less diameter than said opening throughout its length whereby it is freely slidable through said opening and constitutes a closure therefor; a stem secured to the top of said plunger; means in said container for supporting said stem so that the upper portion of said plunger normally closes said opening, the intermediate portion of said plunger being provided with notches which terminate at their upper ends in substantially square shoulders situated below the said upper portion of said body; and stop means on said stem for limiting the upward movement of said plunger.

8. A dispenser for powdered material embodying: a container having a bottom provided with a discharge opening; an elongated plunger body of slightly less diameter than said opening throughout its length whereby it is freely slidable through said opening and constitutes a closure therefor; a stem secured to the top of said plunger; means in said container for supporting said stem so that the upper portion of said plunger normally closes said opening, the intermediate portion of said plunger being provided with notches which terminate at their upper ends in substantially square shoulders situated below the said upper portion of said body; and stop means on said stem for limiting the upward movement of said plunger, said plunger having a bottom portion below said notches adapted to close the opening when the plunger is in its uppermost position.

9. A dispenser for powdered material embodying: a container having a bottom provided with a discharge opening; an elongated plunger body of slightly less diameter than said opening throughout its length whereby it is freely slidable through said opening and constitutes a closure therefor; a stem secured to the top of said plunger; means in said container for supporting said stem so that the upper portion of said plunger normally closes said opening, the intermediate portion of said plunger being provided with notches which terminate at their upper ends in substantially square shoulders situated below the said upper portion of said body; and stop means on said stem for limiting the upward movement of said plunger, said plunger being of

much greater diameter than said stem, thereby providing a shoulder for agitating material in said container during upward movement of said plunger.

10. A dispenser for powdered soap and the like embodying: a container having a substantially flat bottom surface surrounding a discharge opening in its bottom; a cross member in said container having an aperture situated above said discharge opening; a stem slidably mounted in said aperture; stop means on said stem above and below said cross member for limiting the longitudinal movement of said stem through said aperture; and a plunger member secured to said stem in said discharge opening and extending for a substantial distance above and below said discharge opening, said plunger member being provided with downwardly divergent notches terminating in substantially square shoulders at their upper ends and situated so that said discharge opening is closed by a portion of said plunger above said notches when said plunger is in its uppermost position, said notches being of a length less than the distance between the stop members on said stem whereby said discharge opening is closed by a bottom portion of said plunger when it is in its uppermost position.

11. A dispenser for powdered soap and the like embodying: a container having a substantially flat bottom surface surrounding a discharge opening in its bottom; a cross member in said container having an aperture situated above said discharge opening; a stem slidably mounted in said opening; stop means on said stem above and below said cross member for limiting the longitudinal movement of said stem through said aperture; a plunger member secured to said stem in said discharge opening and extending for a substantial distance above and below said discharge opening, said plunger member being provided with downwardly divergent notches terminating in substantially square shoulders at their upper ends and situated so that said discharge opening is closed by a portion of said plunger above said notches when said plunger is in its uppermost position, said notches being of a length less than the distance between the stop members on said stem whereby said discharge opening is closed by a bottom portion of said plunger when it is in its uppermost position; a tapered false bottom mounted on said container with an opening below said discharge opening; and another stem secured to the bottom of said plunger and extending a substantial distance below said false bottom.

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