Jan. 5, 1943. G. H. PACKWOOD, JR 2,307,291

DISPENSER

Filed Oct. 10, 1938 3 Sheets-Sheet 1

Fig. 1.

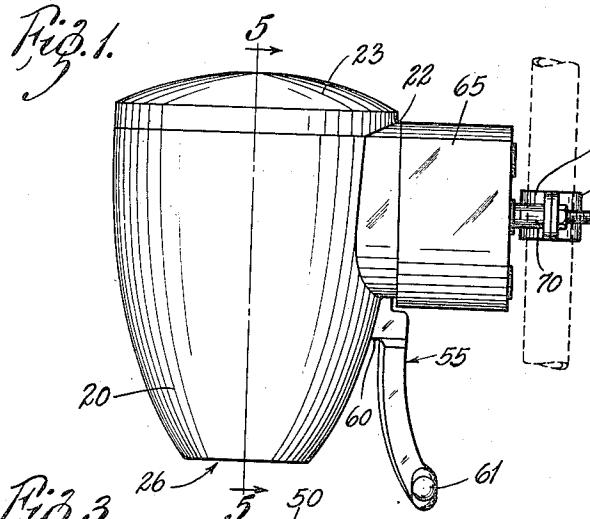


Fig. 2.

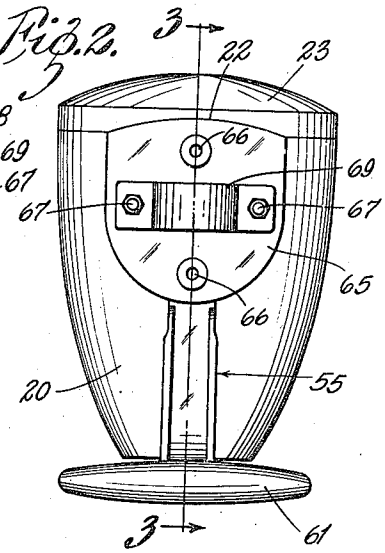


Fig. 3.

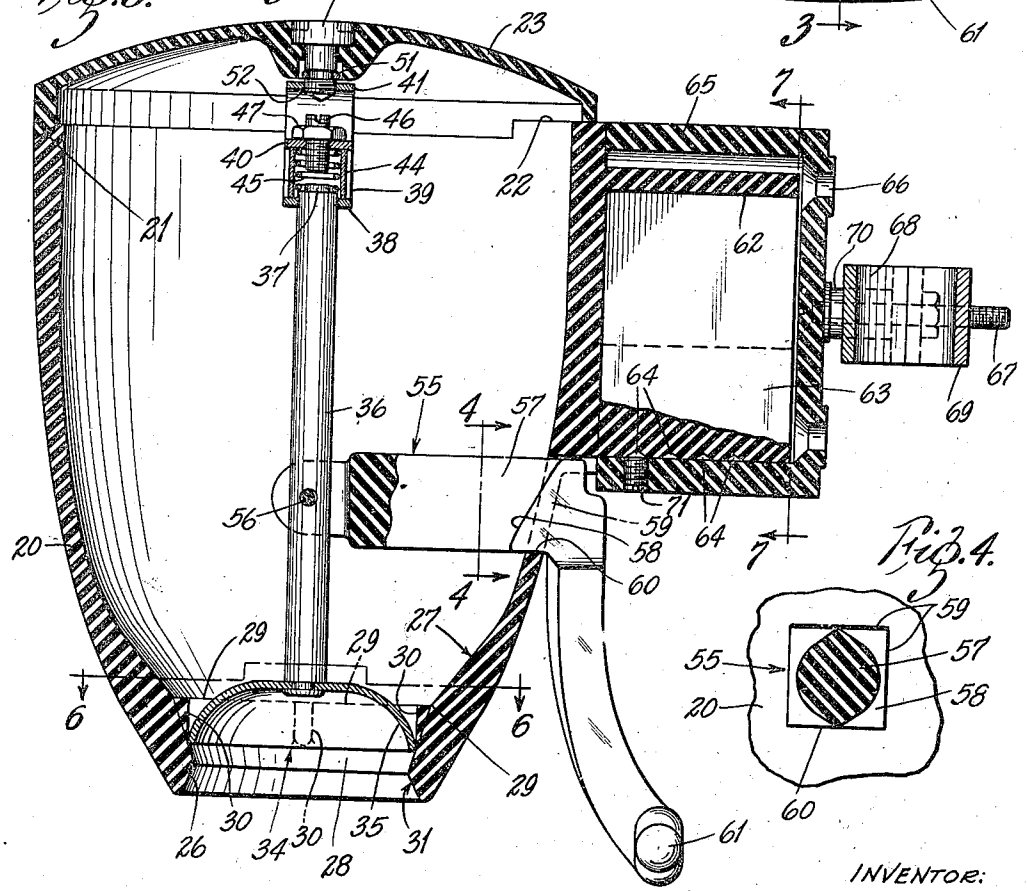


Fig. 4.

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Jan. 5, 1943. G. H. PACKWOOD, JR 2,307,291

DISPENSER

Filed Oct. 10, 1938 3 Sheets-Sheet 2

Fig. 5.

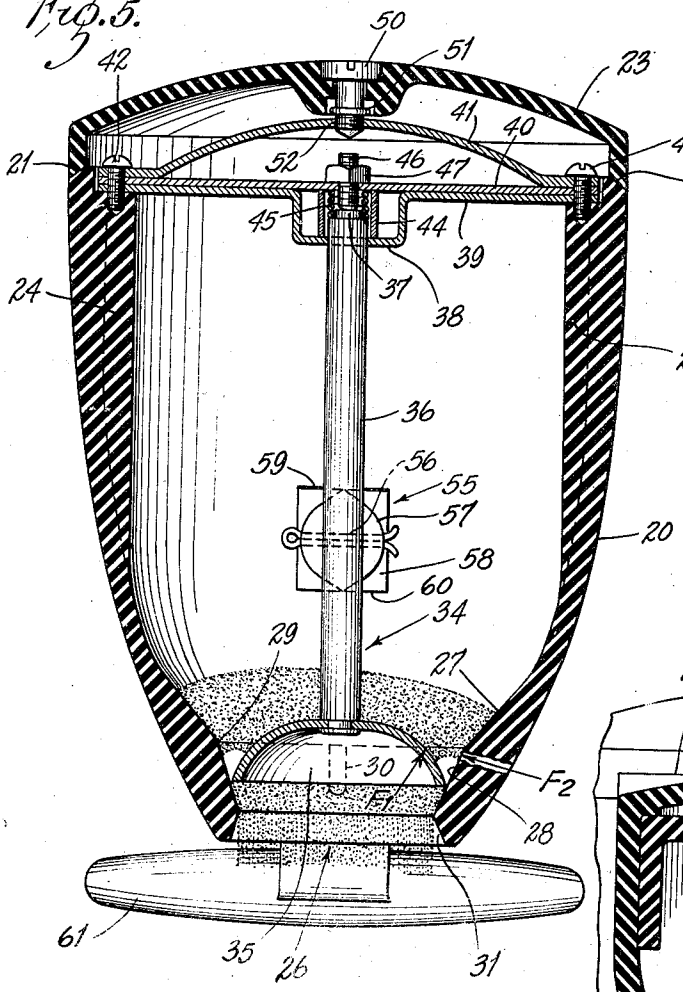


Fig. 14.

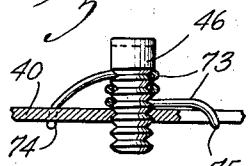


Fig. 15.

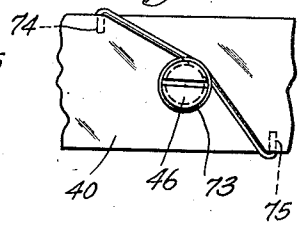


Fig. 7.

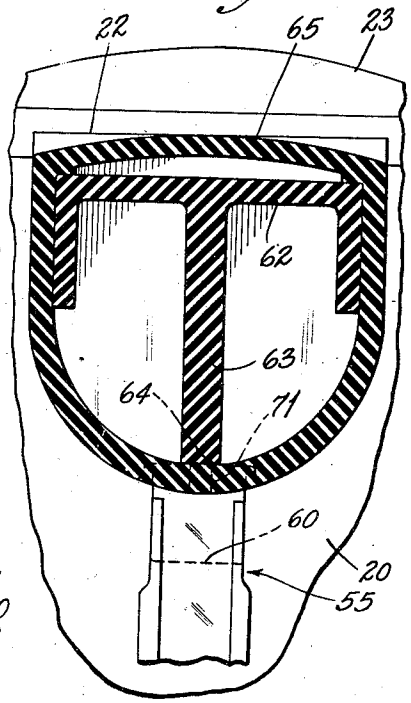
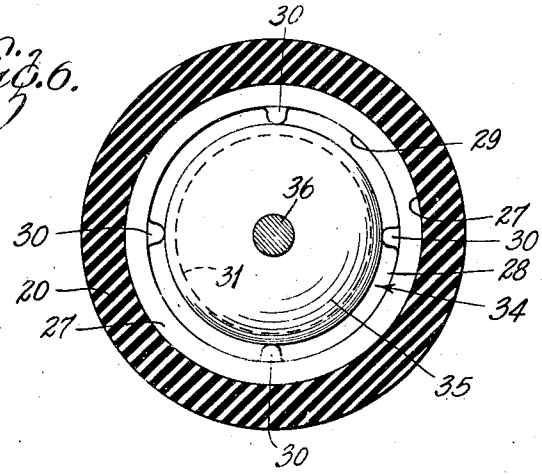


Fig. 6.



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Jan. 5, 1943. G. H. PACKWOOD, JR 2,307,291

DISPENSER

Filed Oct. 10, 1938 3 Sheets-Sheet 3

Fig. 8.

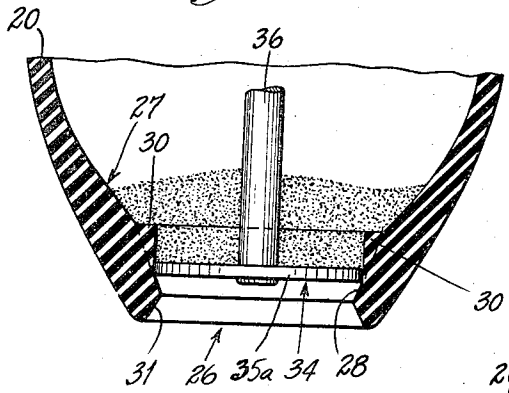


Fig. 9.

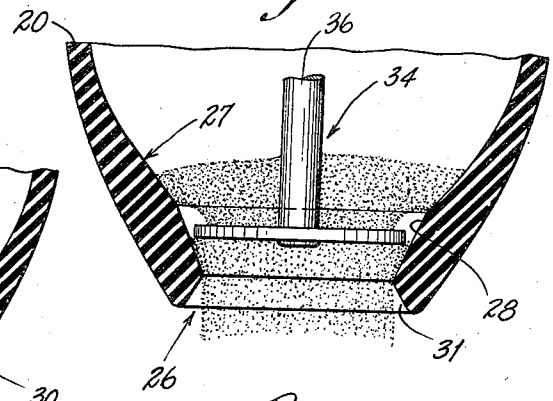


Fig. 10.

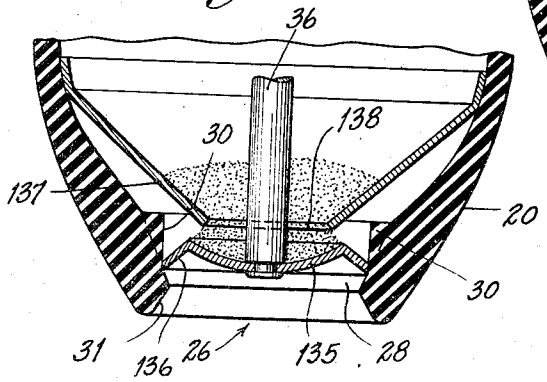


Fig. 11.

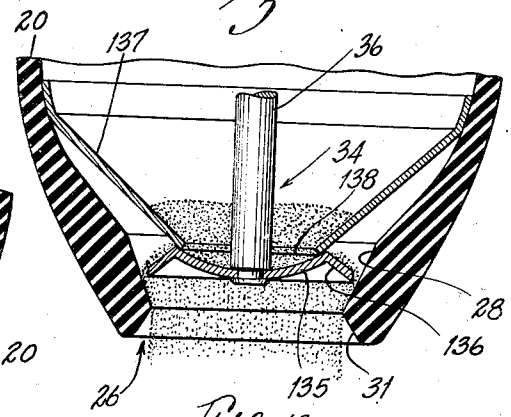


Fig. 12.

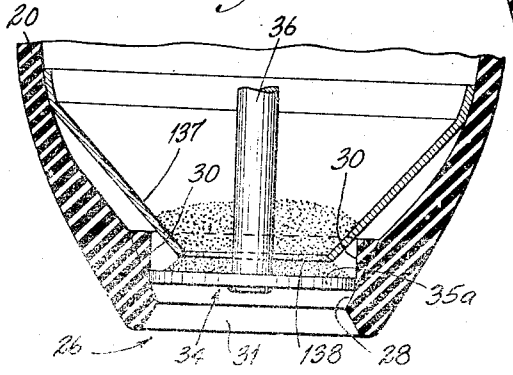
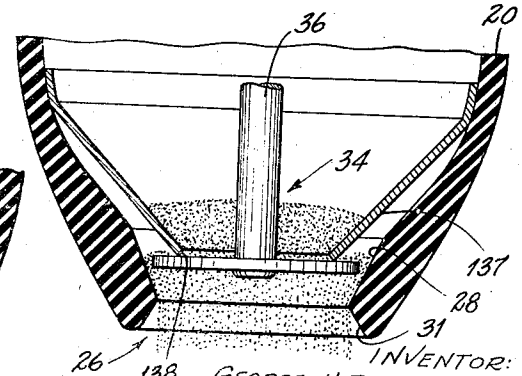


Fig. 13.



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UNITED STATES PATENT OFFICE

2,307,291

DISPENSER

George H. Packwood, Jr., St. Louis, Mo.

Application October 10, 1938, Serial No. 234,186

15 Claims. (Cl. 221—114)

The present application relates to dispensing devices, and will be illustrated in connection with the dispensing of granulated soap.

The invention consists of a reservoir into which a quantity of material may be placed, and which has a discharge opening that is controlled by a valve, upon the opening of which a limited amount of the material may be discharged. The device is adapted to be supported on a wall and a suitable bracket is provided therefor. A handle for operating the valve depends to the rear of the discharge opening for convenient access. The valve and its operating means extend into the bowl of the device and act as agitators to keep the material in a flowing condition. The valve is furthermore adjustable so that the amount of the discharge may be properly controlled.

Objects of the invention include the provision of a control valve having a convenient adjustment for changing the amount of discharge but which adjustment, while accessible without dismantling the entire device is nevertheless concealed against unauthorized change. There is also provided a spring for return of the valve with means to protect the spring from the material in the bowl. The valve is operated by a handle disposed so that the palm of the hand is always beneath the orifice to receive soap when the fingers of the hand open the valve by contact with the handle. The handle is operated by a pulling motion which prevents the use of undue force destructive to the device. The handle further is provided with a means to prevent its becoming clogged with the material, which clogging would hinder its free action.

Other objects include the provision of a bracket with means to attach it directly to a wall or to a vertical or horizontal height. The bracket likewise has concealed fastenings reducing the possibility of stealing. It furthermore may be adjusted to any desired distance out from the wall.

Other objects include the design of the valve orifice and the valve in such wise as to provide a simple reciprocating valve which, nevertheless, can not be bled, and which effects a maximum agitation of the material. The valve port is so designed as normally to pass only a limited quantity of material, and to break up excessively large particles. Its discharge opening is designed to retard the undesirable adherence of the material thereto, whereby it will always remain clean.

In the drawings:

Fig. 1 is a side elevation of the dispenser installed on a pipe;

Fig. 2 is a rear elevation thereof;

Fig. 3 is a vertical section on the line 3—3 of Fig. 2;

Fig. 4 is a vertical section of the valve lever taken on the line 4—4 of Fig. 3;

Fig. 5 is a vertical section on the line 5—5 of Fig. 1;

Fig. 6 is a horizontal section of the valve taken on the line 6—6 of Fig. 3;

Fig. 7 is a vertical section through the bracket taken on the line 7—7 of Fig. 3;

Fig. 8 is a section showing a modified flat type of valve control in closed position;

Fig. 9 is a similar view to Fig. 8 with the valve in open position;

Fig. 10 is a section of an additional modification of the valve in closed position;

Fig. 11 is a view of the valve of Fig. 10 in an open position;

Fig. 12 is a section of a still different type of valve in closed position;

Fig. 13 shows the valve of Fig. 12 in open position;

Fig. 14 is an elevation largely in section of a modified form of locking means for the limit screw; and,

Fig. 15 is a plan view of the locking means of Fig. 14.

The device includes a tapering reservoir or bowl 20 open at the top and bottom. The top edge is beveled at the outer part, as shown at 21, save for an upstanding ledge portion 22 at the rear thereof. A top 23 has its lower edge beveled so as to fit on the bevel 21 and it is provided with a cut-out portion to accommodate the ledge 22. The ledge properly aligns the top on the bowl. The beveled part prevents the collection of particles of the material to be dispensed which would interfere with the proper seating of the cover.

On the interior of the bowl are two opposed bosses 24 and 25 projecting inwardly for a purpose to be described.

The bottom of the bowl is provided with a discharge orifice, generally indicated at 26. The interior walls of the bowl include a conical section 27 joining a second conical section 28, the latter being steeper than the former, whereby there is formed an edge 29 between the two. Spaced guides 30 appear in the conical section 28 for a purpose to be described.

The conical section 28 extends to a third conical portion 31 and this, in turn, forms a flaring outlet for the bowl. Thus, it will be observed that, whereas the conical sections 27 and 28 have

their apices downward, the section 31 has its apex upward.

A valve generally indicated at 34 has a convex valve head 35 adapted to seat toward the lower part of the conical section. This valve head 35 is mounted on a stem 36 extending upwardly into the bowl and terminating below the cover thereon. A projecting lug 37 is situated on the top of the stem 36.

The upper part of the stem passes with a close fit through an opening in a depending portion 38 of a bracket 39. A second bracket 40 is superposed over the bracket 39. A third bowed and upstanding bracket 41 lies above the bracket 40. These three brackets are held in position in the bowl by screws 42, one at each end, which screws pass into the previously mentioned bosses 24 and 25 oppositely located and formed integrally with the bowl.

Within the space contained between the depending portion 39 and the bracket 40 is located a collar 44 which fits closely against the two brackets to form a tight enclosure. The valve stem 36 projects within the collar 44 and its upper end, including the lug 37, reciprocates therein. A coil spring 45 surrounds the lug 37 and is compressed between the valve stem and the bracket 40 so as to urge the valve stem 36 downward to close the valve.

An abutment screw 46 is threaded through the bracket 40 and within the collar 44 to act as a limit to the upward movement of the valve stem 36. A lock nut 47 holds the screw 46 in its adjusted position. This screw presents its kerf upwardly beneath the center of the bowed bracket 41.

In the center of the cover 23 is disposed a capped screw 50. A spring ring 51 surrounds the lower part of the screw to prevent its being withdrawn from the cover. This screw is adapted to be threaded through an opening 52 in the center of the bowed bracket 41. Preferably this screw is provided with a key slot of distinctive type so that it may not be unscrewed without a key.

The opening 52 is located directly above the screw 46 and is sufficiently large so that when the cover 23 is removed a screw driver may be passed through it for operation of the screw 46. It will be observed that with the cover removed the nut 47 is about on level with the top of the bowl, so that it may readily receive a wrench.

A lever generally indicated at 55 is attached pivotally at 56 to the valve stem 36 for operation of the valve. This lever includes a portion 57 within the bowl shaped as shown in Fig. 4 to have a doubly tapered cross-sectional shape. This portion 57 terminates in a shelf 58 adjacent the wall of the bowl. This shelf has a slope less steep than the inside slope of the wall of the bowl. The upper portion of the shelf extends to between the inner wall of the bowl and the outer wall thereof.

An opening 59 is provided through the wall to receive the lever 55. The lower edge 60 of this opening acts as a fulcrum for the lever. Outside the bowl the lever depends to a point directly behind the orifice 26, at which point it is provided with cross handles 61.

It will be seen that with the palm of the hand disposed beneath the orifice 26 the fingers may engage the handle 61 and pivot the lever to open the valve.

Extending from the back of the bowl 20 is a generally T-shaped supporting bracket 62. The upright part 63 of this bracket has a series of notches 64 in its lower edge for a purpose to be described.

A cup-shaped complementary bracket member 65 fits over the T-shaped bracket 62 with a close engagement. The back wall of the member 65 is provided with a plurality (preferably four) screw-receiving openings 66. By means of these openings, screws may be passed into the wall to hold the bracket member 65 thereon.

Where it is desired to attach the device to a pipe, two opposite holes 66 may receive screws 67 over which are disposed pipe-receiving clamps 68 and 69. Spacer members 70 hold the clamps 68 and 69 at the desired distance from the back of the member 65. The two horizontal holes 66 will be employed for attaching the member to a vertical pipe and, as is obvious, the two vertical holes 66 will be used for attaching the member to a horizontal pipe. Obviously, drawing up the nuts on the screws 67 clamps the two members 68 and 69 together about the pipe and against the spacer member 70.

The bracket member 62 is slipped within the cup-shaped member 65 after the same is duly attached. The member 65 has in it a set screw 71 adapted to be turned into any desired one of the notches 64 of the upstanding part 63 of the bracket 62. The notch selected will determine the distance that the bowl 20 is disposed outwardly from the wall or the pipe. It will be observed that the securing screws, passing through the holes 66, are completely concealed from view when the device is installed and only the small set screw, inconspicuously located at the bottom of the bracket, is accessible. This reduces stealing of the device, because it is not obviously detachable.

The modified locking means of Figs. 14–15 consists of a coil spring 73 wrapped around the threads of the screw 46 a few times, and with one end 74 looped under one side of the bracket 40, and with the other end 75 looped under the other side of the bracket. This lock means has a snubbing action that resists movement of the screw, but it permits the same to be moved by a screw-driver.

The operation of this device is as follows:

The screw 50 is withdrawn and the cover 23 removed. A suitable supply of material to be dispensed, such as granulated soap, salt, and so forth, is then put into the bowl. It falls down about the valve head 35. The cover 23 is thereafter replaced and the screw 50 turned down tightly, so that it engages in a sealing relation with the cover, and causes the cover to seal against the upper edge of the bowl. When the valve is closed no moisture can get into the bowl to dampen the soap and cause it to cohere in lumps, or dissolve.

When a user desires soap, he engages his fingers about the handles 61 which are back of the outlet 26 and so located that the palm of his hand will then be disposed immediately beneath the orifice. A slight drawing of the handles 61 forwardly pivots the lever 55 about its fulcrum 60 and, in turn, lifts the valve 34. The valve will be lifted until the lug 37 smartly strikes against the screw 46. The movement of the lever 55, the valve stem 36, and the valve head 35, through the massed material within the bowl, agitates this material so as to keep it evenly distributed and free from lumps. This action is enhanced by the jar given to the device when the valve stem strikes the screw 46. The material above the

entire valve head is bodily displaced, since the head is unobstructedly available to the interior of the bowl.

As the valve lifts it is guided in a vertical direction by the guides 30 within the tapered portion 28 on the inside of the bowl, and by the engagement of the stem 36 through the opening in the bracket 39. When open, the valve provides an annular orifice through which the material from the bowl may pass into the palm of the hand. The steeper the slope of the portion 28, the smaller the orifice and consequently the lesser is the amount of material that will be discharged. Furthermore, the greater the distance the valve head 35 travels upwardly, the wider the annular opening and hence the greater the discharge. Thus, the discharge may be controlled by the adjustment of the screw 46 which limits the upward travel of the valve.

When the valve is lifted it carries with it all the material above it and resting upon it. This material tends to roll off in a direction radially outwardly and downwardly from the valve head 35. It is, therefore, deflected laterally toward the walls of the section 28 by some force component such as that represented at F_1 in Fig. 5 normal to the upper surface of the valve head. Likewise, the material from the portion 27 is deflected inwardly toward the center of the bowl by the slope of the walls thereof. It may, therefore, be said to be acted upon by some deflecting force component such as F_2 normal to the wall surface. These two deflecting forces act toward each other, with the result that material from both the valve and the walls is directed toward the same position. It soon crowds up to form an arch above the valve between the wall 27 and the wall 28, as shown in Fig. 5, and the valve, so that the outlet is blocked off. Hence, only a limited amount of material will flow through the opening, owing to the building up of this arch completely around the orifice. Therefore, although the orifice is directly open to the interior of the bowl, only a limited amount of material will be discharged upon any single operation of the valve.

The curve of the top of the valve causes the initial deflecting force component to be nearer horizontal and, as a consequence, the arch will build up more quickly than with a valve nearer flat on top. This curve reduces the amount of soap delivered by a given width of annular orifice over that delivered by a flat or less curved valve.

When the valve is reseated, this arch is broken down and the material again flows completely to cover the top of the valve.

The operation of this device causes the material directly over the valve to be lifted relative to material immediately adjacent thereto that may be said to be resting upon the side walls of the bowl. Where soap is used, there is always a certain amount of adhesion between adjacent particles. Hence, in an extreme condition, the valve could be lifted completely out of the device carrying a cylinder of soap over the valve head. Since this extreme condition does not normally exist, but since a measure of the condition does exist, there will result a certain grinding action between particles resting on the valve head and adjacent particles resting on the bowl. This grinding action will act to crumble any over-sized particles until they become of a size proper to pass through the orifice. This grinding action results from the sloping relationship of the portion 28 with the valve head. If these two rigid parts are too far apart, the forces acting on the particles will be dissipated over too large an area effectively to accomplish the grinding. The grinding action is increased by the presence of the edge 29 which breaks particles rolled over it.

As the material slides down the inner wall of the bowl, it passes over the inner portion 57 of the valve-operating lever 55. It necessarily falls onto the shelf 58, since the upper part thereof is outside the inner wall. It thereby is deflected outwardly from the walls and is hindered from passing through the opening 60, or from clogging in the opening about the lever. Hence, both loss of material and clogging of the lever action are prevented.

In the modification of Figs. 8 and 9, the valve head 35*a* is made flat in cross-section. This increases the amount of material that will be discharged when the valve is open over the amount discharged from the convex valve, presumably because the force F_1 is less nearly horizontal and the blocking arch thereby carried higher. By the use of this type of valve the slope of the portion 28 will be made more acute for the same discharge and the same motion of the lever 55; or a lesser movement of the lever 55 may be employed to get the same discharge.

In the modification of Fig. 10, the valve is shown at 135 and has a concave upper surface. It also has a flange 136 therearound. Above it is located an overhanging sloping flange 137 inside the bowl. This flange extends inwardly until its lower part is within the outer dimensions of the central portion of the valve 135, over which portion is has a circular opening 138. In this type, the valve is normally sealed with the bowl 20 when in closed position. When lifted, it may move upwardly toward the flange 137 until it closes thereagainst. The amount discharged will be the amount escaping around the valve as it approaches the flange. The device can not be bled because the concave upper surface restricts the amount that will flow down and pile up on the upper surface of the valve. The portion discharged is ejected therefrom by the flange 136.

This type of valve provides a maximum fineness to the adjustment of the valve and the discharge. The latter is controlled not only by the distance between the valve and the flange 137, but also by the distance upwardly of the valve in the passage 28. The former gives a more or less coarse adjustment, which is completed by the fine adjustment produced by the relationship of the valve in the passage.

The type shown in Fig. 12 shows the valve 35*a* in combination with the flange 137 and the action is the same as in the previous modification, save that in this case more material may be discharged because the flat upper surface of the valve permits a larger quantity to flow down and rest thereon. In other words, the material heaps up on the top of the valve in more or less of frusto-conical pile. The angle between the generatrix of the cone and the horizontal is more acute with the flat valve than with the type of valve shown in Fig. 10. The finer adjustment may be had by the relationship between the valve and the passage 28; but, owing to the greater amount of material on the valve, this is less effective than in Fig. 10.

The two types of valves in Figs. 10 and 12 can not be bled because of the supplying of the flange 137, which takes the place of the arching effect of the other types. The combining of the sloping passage and the flange effects a finer adjust-

ment than can be obtained where only the flange is used.

The angle of slope of the section 28 may be varied from that shown, and will depend upon the amount of movement desired for the lever for a given valve opening, and upon the type of material used. It is designed, with both of these in mind, to produce the arching action where used free of the flange, and to produce the gradual and fine adjustment where used with the flange.

What is claimed is:

1. In a dispensing device for comminuted material, a bowl, a discharge passageway in the bottom thereof, said passageway having walls converging toward the bottom at an acute angle to the axis of the passageway, and a valve reciprocable in the passageway to open and closed position, the walls of the bowl and passageway providing paths extending in different directions but both downwardly and inwardly, whereby said paths may cause material on them to descend in different directions.

2. In a dispensing device, a bowl, a discharge passageway in the bottom thereof, the walls of the passageway being tapered, a valve reciprocable in the passageway to open and closed position, and guide means in the walls of the passageway adapted to abut the edges of the valve to keep the valve in alignment in the passageway during its reciprocation.

3. In a dispensing device, a bowl, a discharge opening therein, a valve for controlling the opening, a valve stem extending into the bowl, a bracket member on the bowl, a stop on the bracket member against which the valve stem is adapted to abut, a spring for urging the valve stem to close the valve, and means enclosing the spring and sealing it away from the interior of the bowl, said stop and the stem extending oppositely into the sealing means, and the stop being adjustable to vary the stroke of the valve stem.

4. In a dispensing device, a bowl, a discharge opening therein, a valve in the opening, a valve stem on the valve, means accessible from the top of the bowl for adjusting the travel of the valve, a bracket over said means, a cover for the bowl, and means for attaching the cover to the bracket including a hole in the bracket above the adjusting means to render the latter accessible upon removal of the cover.

5. In a dispensing device, a bowl having an opening at the top, a cover for the top opening, the edges of the bowl engaged by the cover tapering downwardly and outwardly whereby to shed material falling onto them, and means sealing the cover onto the bowl.

6. In a dispensing device, a bowl having a passage in the bottom thereof, a flange over the passage and having an opening smaller than the passage, and a valve operable in the passage and having an upper surface including a concave portion, and a radially extending surface portion extending outwardly from the perimeter of the concave portion, the valve being reciprocable toward and from the flange and the walls of the passage tapering downwardly and inwardly toward the valve and the edge portion of the valve being adapted to seat in the passage to close the same.

7. In a dispensing device, a bowl for containing divided material, an opening in the side thereof, an operating means including a member passing through the opening, said member being of a size substantially to fill the opening, but having a reduced size within the bowl, and a surface at the junction of the reduced portion that slopes downwardly and inwardly relative to the bowl to deflect the material into the bowl and prevent its passing out the opening.

8. In a dispensing device for material such as powdered soap, a bowl having a discharge orifice in the bottom thereof, a valve in said passage contained above the bottom of the orifice, means for lifting the valve, said means being located to avoid obstructing access by the hand to the orifice, the bowl below the orifice flaring outwardly so that material falling from the orifice may drop without contacting the lowest edge of the bowl in its descent.

9. In a dispensing device, a bowl having a discharge orifice at the bottom thereof, a valve in said orifice, a valve stem above said valve, guide means in the bowl to keep the valve in a predetermined path, an actuating means to lift the valve including a member pivotally attached to the stem intermediate its ends and extending across through the wall of the bowl, and a handle member secured to said first member and depending to a position adjacent the orifice so as to permit one part of the hand to operate the handle to lift the valve, and another part of the hand to receive the material.

10. In a dispenser device, a bowl having a passage in the bottom thereof, said passage having walls providing smaller diameter at the bottom than at the top, an inside wall in the bowl having an opening therethrough above and spaced from the passage, a valve having an upper surface larger than the opening and adapted to receive material from the opening, said surface comprising an inner concave portion, extending radially from the perimeter of which inner portion is a downwardly extending flaring edge portion, and said valve having a size greater than the smaller size of the passage, and said edge portion of the valve being adapted to engage the smaller portion of the passage when the valve is lowered to check egress of material from the passage, and said upper surface of the valve, when the valve is lifted, being cooperable with the inside wall about the opening to eject material from the said upper surface.

11. In a dispensing device for finely divided material, a bowl having a discharge passage therein, and an opening through a side wall thereof, an operating member extending through the opening in the side wall, and means on the operating member adjacent the opening against which material in the bowl strikes, said means having a shape to deflect the material toward the interior of the bowl and away from the opening.

12. In a dispensing device for finely divided material, a bowl, a discharge passageway therein, a valve movable within the discharge passageway from a closing position to positions wherein the passageway is larger than the valve to permit flow of the material around the valve, a valve stem means extending into the bowl from said valve, said passageway and valve being shaped to stop the flow of material from the opening after the valve reaches an open position at any point in the passageway striker means within the bowl and extending adjacent the upper part of the valve stem means, an adjustable abutment on the striker means above the upper part of the valve stem means, and means to adjust said abutment to vary the travel of the valve while still obtaining agitation by im-

pact of the valve against the striker member.

13. In a dispenser for finely divided material or the like, a bowl, a passageway at the bottom thereof for egress of material, said passageway having a narrower portion and a wider portion, but in all portions being of a shape and size to provide free flow of material from the bowl, valve means including a valve in the passageway to control said flow therethrough, the valve being of a size to prevent flow, when in the narrower portion of the passageway, but smaller than the wider portion, to permit flow around the valve and below the same, through the passageway when the valve is in the larger portion, means to maintain the valve at rest in its flow-preventing or closing position, means to displace the valve therefrom to its flow-permitting or open position, the valve and associated parts maintaining the passageway below the valve unobstructed for free flow of the material below the valve, the walls of the passageway in its wider portion sloping inwardly and downwardly to deflect the material toward the valve, the valve being adapted to support material and deflect the same outwardly toward the walls, the size of the valve and wider portion of the passageway being such that the opposing forces cause the material to bridge over above the bottom of the valve to check the discharge and limit the same to the material flowing below the bridge and before formation of the same, and means to limit the opening movement of the valve to said position relative to the wider part of the passageway wherein the bridging may occur.

14. In a dispenser for finely divided material or the like, a bowl, a passageway at the bottom thereof for egress of material, said passageway having a narrower portion and a wider portion, but in all portions being of a shape and size to provide free flow of material from the bowl, valve means including a valve in the passageway to control said flow therethrough, the valve being of a size to prevent flow, when in the narrower portion of the passageway, but smaller than the wider portion, to permit flow around the valve and below the same, through the passageway when the valve is in the larger portion, means to maintain the valve at rest in its flow-preventing or closing position, means to displace the valve therefrom to its flow-permitting or open position, the valve and associated parts maintaining the passageway below the valve unobstructed for free flow of the material below the valve, the walls of the passageway in its wider portion sloping inwardly and downwardly to deflect the material toward the valve, the valve being adapted to support material and deflect the same outwardly toward the walls, the size of the valve and wider portion of the passageway being such that the opposing forces cause the material to bridge over above the bottom of the valve to check the discharge and limit the same to the material flowing below the bridge and before formation of the same, and means to limit the opening movement of the valve to said position relative to the wider part of the passageway wherein the bridging may occur, said limiting means comprising a member to be engaged by the valve means upon opening movement thereof, and adapted to agitate the contents of the bowl to break down any bridging formed before the valve reaches the limit of its stroke.

15. In a dispenser for finely divided material, a bowl having an orifice therein to discharge said material, a valve for controlling the orifice, a handle for the valve, said handle comprising a bell crank lever having one end depending to a point approximately a distance from the orifice equal to the distance from the palm of the hand to the ends of the fingers, the other end of the lever extending within the bowl, means pivoting the bell crank onto the bowl for movement of the depending handle portion toward and from the orifice, and means connecting said other end with the valve to enable the valve to be displaced when the handle is moved by the fingers of a hand, with the palm of the hand below the orifice.

GEORGE H. PACKWOOD, JR.