Aug. 23, 1966 W. B. SPATZ 3,268,123

DISPENSERS FOR FLUENT MASSES

Filed April 21, 1964 2 Sheets-Sheet 1

Fig. 1

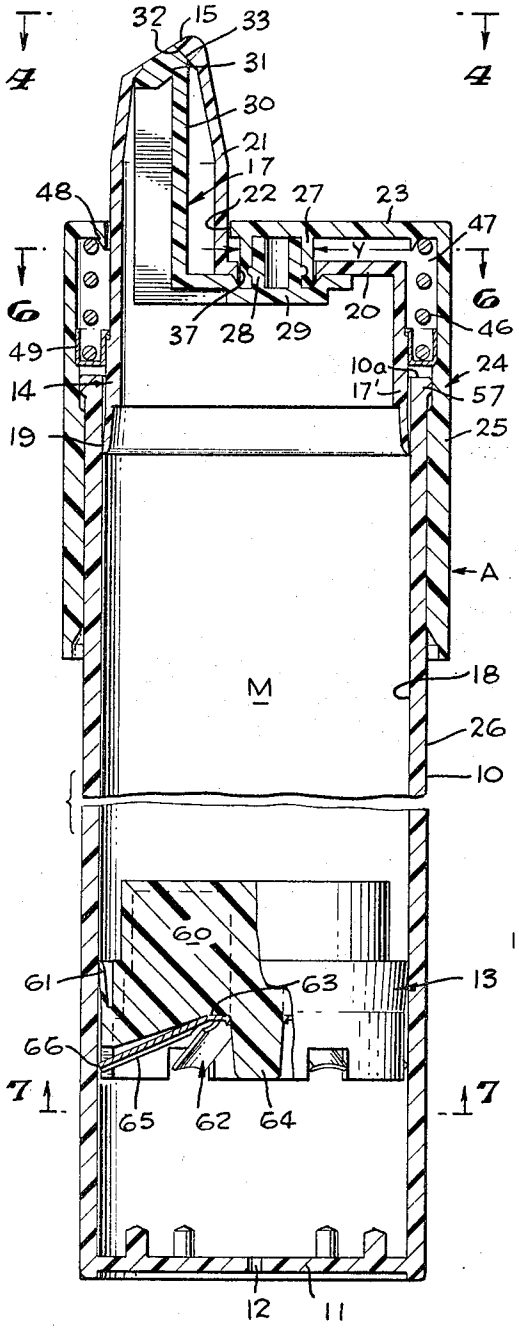


Fig. 2

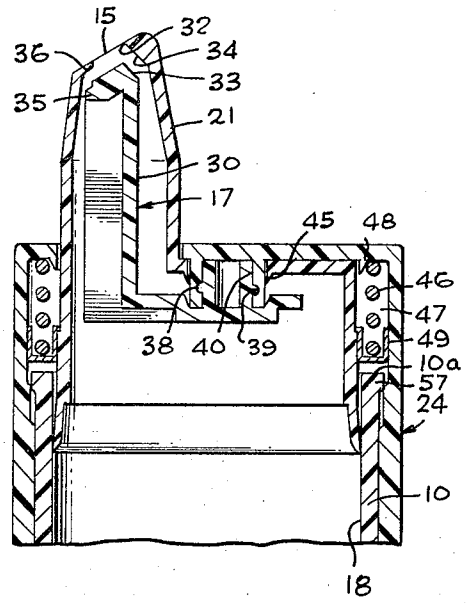
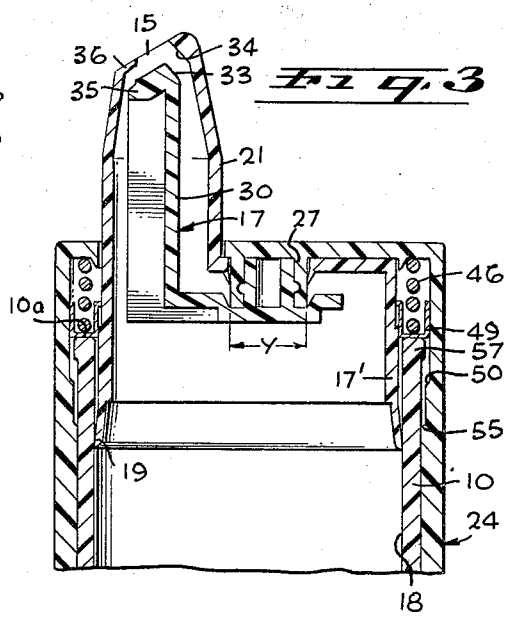


Fig. 3



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DISPENSERS FOR FLUENT MASSES

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Fig. 5

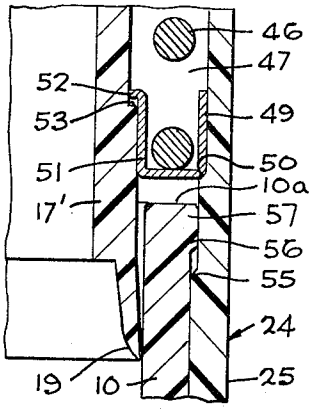


Fig. 4

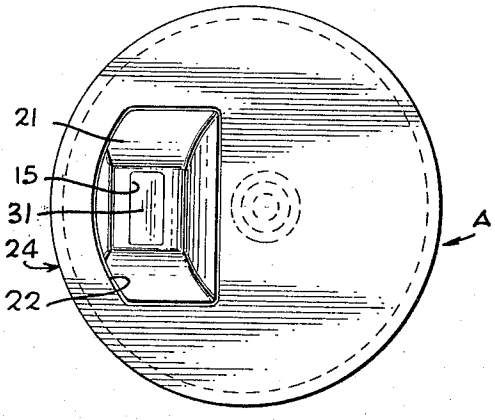


Fig. 6

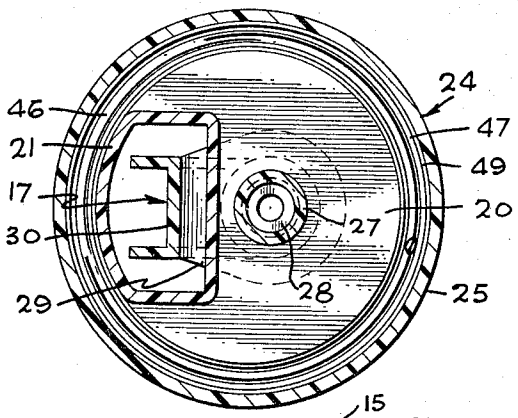
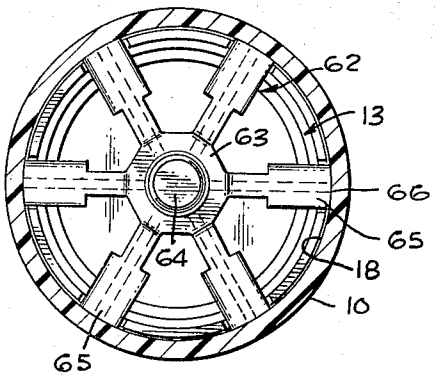


Fig. 7



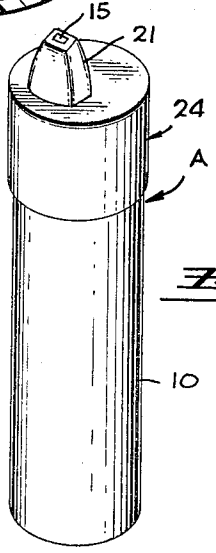


Fig. 8

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3,268,123

DISPENSERS FOR FLUENT MASSES

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Filed Apr. 21, 1964, Ser. No. 361,465
20 Claims. (Cl. 222—400.5)

The present invention relates to dispensing devices, and more particularly to dispensing types of containers from which fluent substances can be discharged.

In United States Patent No. 3,088,636, a dispensing type of container for a fluent mass is disclosed, which is capable of being discharged by decreasing the effective volume of the container forwardly of a follower device, after which the volume is increased to create a partial vacuum that causes atmospheric pressure rearwardly of the follower device to move it forwardly in the container and decrease the effective volume of the container by the quantity of the fluent mass previously discharged.

An object of the invention is to provide a dispensing container of the type indicated which embodies a check valve shiftable to open position when dispensing is desired without the necessity for first subjecting the fluent mass in the container to pressure.

Another object of the invention is to provide a dispensing container of the type indicated in which the initial phase of decreasing the effective volume of the container forwardly of the follower device automatically opens the discharge or check valve without substantial application of pressure to the fluent mass in the container, after which continued decrease of such volume applies pressure to the fluent mass and produces its dispensing through the open valve. Release of the dispensing force on the pressure applying portion of the container is accompanied by prompt closing of the valve, followed by return of the pressure applying portion to its initial position.

A further object of the invention is to provide a dispensing container of the type indicated which automatically accommodates itself to increase or decrease in volume of the fluent mass due to its temperature rise or fall, to avoid inadvertent and undesired discharge of any portion of the fluent mass, or damage to the container parts. The increased volume of the mass resulting from rise in its temperature is dissipated each time a portion of the mass is discharged from the container, restoring the container to a condition capable of again accommodating further expansion of the fluent mass resulting from increase in its temperature.

An additional object of the invention is to provide a dispensing container from which a fluent mass can be discharged through an outlet by subjecting the mass to pressure, in which the mass at the outlet is drawn back into the container automatically as a result of discontinuing the application of pressure thereto, thereby avoiding undesirable drooling at the container mouth.

This invention possesses many other advantages, and has other objects which may be made more clearly apparrent from a consideration of a form in which it may be embodied. This form is shown in the drawings accompanying and forming part of the present specification. It will now be described in detail, for the purpose of illustrating the general principles of the invention; but it is to be understood that such detailed description is not to be taken in a limiting sense, since the scope of the invention is best defined by the appended claims.

Referring to the drawings:

FIGURE 1 is a longitudinal section through a container device embodying the invention, with its outlet portion closed;

FIG. 2 is a longitudinal section through the upper portion of the container disclosed in FIG. 1, with its valve open;

FIG. 3 is a view similar to FIG. 2, disclosing the position of the parts after the valve has been opened and a portion of the fluent mass in the container has been dispensed;

FIG. 4 is a top plan view taken as indicated by the lines 4—4 on FIG. 1;

FIG. 5 is an enlarged fragmentary section of a portion of the container device;

FIG. 6 is a cross-section taken along the line 6—6 on FIG. 1;

FIG. 7 is a cross-section taken along the line 7—7 on FIG. 1;

FIG. 8 is an isometric view of the container device disclosed in the other figures, but on a smaller scale.

The container device A illustrated in the drawings is adapted to hold a fluent or fluid-type mass M, such as toothpaste, sunburn lotion, hand cream, mayonnaise, and the like, the particular mass being controllably dispensed from the container by the application of finger pressure to a portion thereof.

As specifically shown, a container or tube **10** has a rear end wall **11** integral or frictionally held therein provided with a hole or air vent **12** to permit air at atmospheric pressure to enter the rear portion of the container and act upon a one-way follower device **13** slidable in a forward direction only in the container. This follower device is at the rear of the fluent mass M in the container, the forward part of which is disposed within an inner generally cup-shaped head **14** reciprocable in the forward portion of the container. The inner head or spout portion of the container has a discharge outlet or mouth **15** through which the contents of the container can be expelled, this outlet or mouth being closed by a suitable plug or valve device **17**.

The inner head **14** includes a skirt conforming in shape to the inner wall **18** of the container and having a downwardly facing lip **19** adapted to slidably and sealingly engage the inner container wall. This skirt portion merges into an end wall **20** from which a nozzle **21** projects that has the discharge opening, outlet or mouth **15** at its outer end, the nozzle extending through an opening **22** in the outer end wall **23** of an outer head **24** having a depending skirt **25** extending slidably along the exterior or periphery **26** of the container or tube **10**. The outer end wall **23** has a depending hollow boss **27** integral therewith receiving a pin portion **28** of the valve member **17**, which is integral with a transverse arm **29** of the latter, the arm, in turn, being integral with an upwardly projecting valve stem **30** integral with a valve head **31** adapted to engage the outer end or valve seat **32** of the nozzle and close its outlet or mouth **15**.

The extent of outward movement of the valve head **31** and its appropriate centering and sealing in the outlet mouth **15** is determined by engagement of an inclined surface **33** on the head with the companion inclined surface **34** of its seat at one side of the outlet or mouth, which tapers from the adjacent wall of the nozzle **21** in a direction toward its outlet or mouth **15**. The extent of outward movement of the valve head is primarily limited by engagement of a shoulder **35**, extending inwardly from the outer end of the head **31**, with the end **36** of the nozzle at the side of its mouth **15** opposite the inclined surface **34**, and by engagement of the arm **29** with the end wall **20**.

The outer head **24** and the valve member **17** are secured together, being movable as a unit with respect to the inner head or spout **14**. Thus, the boss **27** projecting inwardly from the outer end wall **23** of the outer head projects through a companion opening **37** in the end wall **20** of the inner head and engages the arm **29**, the pin **28** extending outwardly from the transverse valve arm, in turn, engaging the inner end of the boss. Separation

between the valve member 17 and the outer head 24 is prevented by a circumferential rib 38 on the pin disposed within a companion circumferential groove 39 in the boss. Since the parts are preferably made of an elastic material, as a suitable synthetic resin, the pin 28 can be pushed into the boss socket 40, the rib 38 on the pin deflecting inwardly and passing into the bore of the socket, then expanding outwardly into the companion groove 39, to thereby firmly secure the outer head 24 to the valve member 37. The outer head 24 and valve member 17 are movable longitudinally relative to the inner head 14 by a distance sufficient to insure movement of the valve member 17 inwardly away from the outlet or mouth 15, in order to open the latter. When the valve element 17 is in closed position within the nozzle 21 against the tapered seat portions 34, 36 of the latter, a gap or space exists between the inner and outer end walls 20, 23, the inner end wall 20 then resting upon the transverse arm 29 of the valve member (FIG. 1). The exertion of finger pressure, or the like, against the outer end wall 23 will move it toward the inner end wall 20, the valve member 17 moving with the outer head member 24 and within the nozzle 21 to shift the valve head 31 inwardly away from its companion seat 32 defining the mouth 15 of the nozzle. The extent of such opening is determined by engagement of the outer end wall 23 with the inner end wall 20, as disclosed in FIG. 2. Continued application of inward force on the outer end wall 23 or head 24 then results in axial inward movement of the inner head 14 and its application of pressure to the fluent mass M in the container 10, discharging a portion of the mass through the open mouth 15 of the nozzle 21 (FIG. 3). Leakage of the mass around the exterior of the inner head 14 is prevented by the slidable sealing of its lip 19 against the inner wall 18 of the container, while leakage between the boss 27 and the inner end wall 20 is prevented by an inwardly facing lip seal 45 projecting inwardly from the end wall 20 sealingly engaging the periphery of the boss. Release of the inwardly directed force on the outer head 24 permits it to return to its initial position, carrying the valve 17 with it to first close the nozzle outlet 15 and then returning the inner head 14 in a forward direction to its initial position.

The outer head 24 and valve member 17 are urged in an outward direction by a helical compression spring 46 disposed in an annular space 47 between the inner and outer heads, with its outer end bearing against the end wall 23 of the outer head. The end portion of the spring surrounds a circular rib 48 extending inwardly from the outer end wall 23 to hold the spring in a position adjacent to the outer wall skirt 25. The inner end of the spring is disposed within a U-shaped annular spring seat 49, the outer portion of which is engageable with a upwardly facing shoulder 50 on the skirt 25. The inner wall 51 of the spring seat has a flange 52 extending inwardly therefrom overlying an upwardly facing shoulder 53 on the exterior of the skirt 17^1 of the inner head. When dispensing of the fluent mass M is not occurring, it is preferred that the spring seat 49 engage the shoulder 50 on the outer head skirt 25, and the the flange 52 be spaced outwardly a slight distance from the inner head shoulder 53 such that a spring force is not being imposed on the inner head 14 when the dispenser is not being used. Transmission of such spring force to the head 14 might have the undesired effect of eventually pulling the ribs 38 from the groove 39 and the pin portion 28 from the boss socket 40.

The spring seat 49 engages the outer end 10*a* of the container or tube 10, or it may be spaced slightly from it by a short distance when the outer head is in its non-dispensing position on the tube. At this time, another inner and upwardly directed shoulder 55 of the skirt is disposed below a companion shoulder 56 on an outwardly directed flange 57 at the upper end of the container 10. When the spring seat 49 engages the shoulder 50, the distance between the base of the spring seat and the skirt shoulder 55 is substantially greater than the distance between the upper end 10*a* of the tube 10 and its shoulder 56. As a result, the entire head and valve assembly 14, 24, 17, 46, 49 can float as a unit upwardly and downwardly of the container between limits. Upward movement is limited by engagement of the shoulder 55 with the shoulder 56, downward floating movement being limited by engagement of the spring seat 49 with the end 10*a* of the container. Because of this arrangement, the entire head assembly is movable longitudinally of the tube or container 10 to a significant degree without applying pressure to the fluent mass M in the container, described hereinbelow.

The follower device 13 includes a piston 60 having a forwardly directed annular lip type seal 61 for slidable sealing engagement with the wall 18 of the container or tube 10. Mounted on the rear portion of the piston is a one-way latch device 62 including a central hub portion 63 adapted to fit over and be secured to a rearwardly directed stem portion 64 of the piston, the latch device including generally radial spring-like arms 65 which are inclined outwardly and rearwardly toward the wall 18 of the container, the outer end 66 of each arm engaging such wall. When the head 14 is depressed to dispense the fluent mass M from the container, the pressure developed in the mass cannot shift the follower device 13 rearwardly since the outer ends 66 of the latch fingers or arms 65 grip the inner wall of the container. However, when the pressure on the outer head 24 is released and it moves in a direction outwardly of the container 10, a partial vacuum is created in the fluent mass forwardly of the piston 60 and the atmospheric pressure entering the rear of the container through the hole or air vent 12 acts upon the piston and moves it forwardly against the fluent mass, the arms 65 sliding forwardly along the wall 18.

Initially, the follower device 13 is disposed adjacent to the rear wall 11, the fluent mass filling the container forwardly of the piston and also being disposed within the inner head 14 and its nozzle 21. At this time, the spring seat 49 may be resting upon or be disposed immediately above the outer end 10*a* of the container or tube, the spring seat engaging the shoulder 50 of the outer skirt 25, the valve 31 closing the outlet or mouth 15. The parts are then in the condition illustrated in FIG. 1. Assuming a portion of the fluent mass M is to be dispensed through the nozzle 21, inward pressure, as by use of a finger, is imposed on the outer end wall 23 of the outer head 24. The inner head 14 cannot move inwardly or rearwardly at this time because of the presence of the fluent mass. Accordingly, such inward pressure will first move the plug or valve member 17 inwardly to open the outlet or mouth 15 to the extent determined by engagement of the outer end wall 23 with the inner end wall 20, as shown in FIG. 2. The shifting of the boss 27 within the inner end wall 20 and the interior of the inner head 14 will develop a relatively small pressure in the fluent mass M, but the decreased volume in the inner head is relatively small, and whatever pressure is developed will be promptly dissipated upon slight inward movement and disengagement of the valve head 31 from its companion seat 32.

Additional inward movement of the outer head 24 and its end wall causes the outer head skirt 25 to slide along the periphery of the container or tube 10 and shifts the inner head 14 inwardly of the container, decreasing the volume in the latter forwardly of the piston 60 and causing a quantity of fluent mass corresponding to the decrease in volume to be discharged through the open outlet or mouth 15. During such inward movement of the heads 14, 24 and the valve or plug 17 attached to the outer head, the spring 46 is compressed because of engagement of the spring seat 49 with the end 10*a* of the tube.

When the finger pressure on the outer end wall **23** is released, the spring **46** expands and first shifts the outer head **24** and its valve member **17** in an axial outward direction, the inner head **14** at first remaining in the inward position to which it has been shifted, the valve member head **31** moving outwardly into engagement with its companion seat **32** to close the mouth **15** of the nozzle **21** and the transverse arm engaging the end wall **20** of the inner head. Continued expansion of the spring **46** then causes the outer head **24**, inner head **14** and valve member **17** to move outwardly as a unit to return all of the parts to their initial position with respect to the container or tube **10**. During such outward shifting of the inner head **14**, a partial vacuum is created within the container forwardly of the piston **60**, inasmuch as the valve head **31** has closed the outlet **15** preventing air at atmospheric pressure from entering the forward portion of the container. Accordingly, the greater atmospheric pressure rearwardly of the piston **60** is effective to shift the latter forwardly against the fluent mass M, the latter being caused to completely fill the container space forwardly of the piston.

When the head **14** has been pushed inwardly to apply pressure to the fluent mass, the one-way latch device **62** on the piston precludes the latter from moving in a rearward direction. As a result, the mass M is dispensed from the container by an amount corresponding to the inward displacement of the inner head **14**, which acts as a pump piston in generating a pressure in the fluent mass and discharging it through the open outlet or mouth **15**.

As described hereinbefore, normally there is a longitudinal space between the skirt shoulder **55** and the tube shoulder **56**. As a result, in the event the temperature of the fluent mass M increases, its corresponding increase in volume will merely shift the heads **14, 24** in an outward direction. The heads act as a movable portion of an expansion chamber to accommodate the increase in volume of the fluent mass. The heads, in effect, function as a floating closure for the container **10**. If the temperature of the mass M decreases, its volume will also decrease, the heads **14, 24** moving rearwardly or inwardly of the container **10** to automatically compensate for the reduced volume, the pressure of the fluent mass remaining substantially atmospheric. In this connection, it is important that the friction drag of the inner and outer heads **14, 24** along the inner and outer walls **18, 26** of the container **10** be less than that of the follower device **13** along the inner wall **18**. Otherwise, a decrease in temperature of the fluent mass M would result in forward movement of the follower device **13** in the container rather than descent or inward movement of the heads **14, 24** along the container or tube. Assuming a previous rather large increase in temperature has shifted the heads **14, 24** outwardly to substantially their fullest extent, at which the shoulders **55, 56** are on the verge of abutting, a subsequent substantial decrease in temperature of the mass and corresponding reduction in its volume would, if the friction of the heads against the container **10** were greater than the friction of the follower device **13** along the container, result in forward feeding of the follower device **13**. Subsequent increase in temperature would then cause the volume of the fluent mass to again increase, the heads being incapable of moving outwardly to compensate for the increased volume because of engagement between the shoulders **55, 56**, the one-way latch device **62** preventing rearward movement of the follower device **13**. The result would be discharge of some of the mass M or breakage of the latch fingers **63**, or other parts. However, this does not occur, inasmuch as the head **14** floats inwardly and outwardly of the container **10** to compensate for decrease or increase in temperature of the mass, no movement of the piston **60** resulting because of the temperature change.

Assuming the heads **14, 24** have moved outwardly of the container to compensate for thermal expansion of the fluent mass M, subsequent inward shifting of the heads **14, 24** to discharge part of the fluent mass dissipates the increased volume, so that release of the inward pumping force from the heads causes them to return to their initial positions disposed further inwardly along the container. Thus, the floating heads can move outwardly a greater distance in the event of later rise in temperature of the fluent mass.

It is to be noted that the inward shifting of the boss **27** relative to the end wall **20** of the inner head results in a slight pressure being developed in the fluent mass M, which is almost immediately dissipated because of the prompt removal of the valve head **31** from engagement with its companion seat **32**. Continued inward movement of the boss **27**, until the outer end wall **23** engages the inner end wall **20** results in some, although slight, displacement of the fluent mass through the outlet or mouth **15**. If the cross-sectional area Y of the boss is made larger than that of the mouth or discharge orifice **15** of the nozzle **21**, the return or outward movement of the boss relative to the inner head or spout **14**, to replace the plug or valve head **31** in engagement with its seat **32**, will create a slight vacuum or suction within the container, causing some "suck-back" through the orifice or mouth **15**, thereby clearing the latter of any adherent portion of the fluent mass previously dispensed. Accordingly, the making of the area Y greater than the area of the orifice **15** avoids undesirable drooling upon release of the pressure on the outer head **24** and the reshifting of the valve member **17** to closed position. Of course, subsequent outward movement of the outer and inner heads **24, 14** with the valve closed creates a substantially greater suction within the container **10**, causing the follower or chaser **13** to move in a forward direction by an amount corresponding to the volume of the fluent mass previously displaced.

It is, accordingly, apparent that a dispensing container has been provided in which opening of the check valve device **17** occurs mechanically without the necessity for effecting its opening as a result of applying pressure to the fluent mass. Pressure is imposed on the mass only after the valve has been shifted to its open position, after which the pumping action on the inner head or spout **14** occurs to effect discharge of the contents M of the container through the nozzle or orifice **15**. As soon as the pump force on the outer head **24** is released, the valve **17** promptly returns to its closed position. If the boss has the greater area Y than that of the orifice area, a slight back-sucking or suction action in the orifice **15** will occur to substantially clear the latter of the fluent material. Thereafter, the heads **14, 24** ascend as a unit to return them to their initial position, creating suction in the container and causing the atmospheric pressure behind the follower device **13** to shift it forwardly. Repeated dispensing results in a progressive forward shifting of the follower device **13** until it contacts the inner head **14**, into which it can fit to be assured of dispensing substantially the full contents of the container.

I claim:

1. In a dispenser for a fluent mass: a container for the mass; closure means for the container and having an outlet; a valve member movable relative to said closure means to open and close said outlet; said closure means being movable in a direction inwardly of said container to apply pressure to the mass therein and force it through said outlet; and actuating means connected to said valve member for shifting said valve member to open position whereby subsequent movement of said closure means in a direction inwardly of said container applies pressure to the fluent mass therein and forces a portion of said mass through the open outlet.

2. In a dispenser for a fluent mass: a container for the mass; movable closure means for the container and having an outlet; a valve member movable relative to said

closure means and said container to open and close said outlet; and actuating means operatively associated with said valve member and closure means for shifting said valve member to open position and for then forcing said closure means in a direction inwardly of said container against the mass in said container to apply pressure thereto and force a portion of the mass through the open outlet.

3. In a dispenser for a fluent mass: a container for the mass; closure means for the container and having an outlet; piston means in said container movable in a forward direction toward said closure means and against the mass in the container; means for resisting movement of said piston means in said container in a rearward direction while permitting movement of the piston means in a forward direction in the container; valve means movable relative to said closure means to open and close said outlet; said closure means being movable with respect to said container to apply pressure to the mass therein and force it through said outlet; and actuating means operatively associated with said valve means for shifting said valve means to open position whereby subsequent movement of said closure means relative to said container applies pressure to the fluent mass therein forwardly of said piston means and forces a portion of said mass through the open outlet.

4. In a dispenser for a fluent mass: a container for the mass; closure means for the container and having an outlet; piston means in said container movable in a forward direction toward said closure means and against the mass in the container; means for resisting movement of said piston means in said container in a rearward direction while permitting movement of the piston means in a forward direction in the container; valve means movable relative to said closure means to open and close said outlet; and actuating means operatively associated with said valve means and closure means for shifting said valve means to open position and for then forcing said closure means against the mass forwardly of said piston means to apply pressure thereto.

5. In a dispenser for a fluent mass: a container for the mass; movable closure means for the container and having an outlet; a valve member movable relative to said closure means to open and close said outlet; actuating means operatively associated with said valve member and closure means for shifting said valve member to open position and for then forcing said closure means in a direction inwardly of said container against the mass in said container to apply pressure thereto and force a portion of the mass through the open outlet; and means for returning said valve member to outlet closing position and said closure means in a direction outwardly of said container to its initial position.

6. In a dispenser for a fluent mass: a container for the mass; closure means for the container and having an outlet; piston means in said container movable in a forward direction toward said closure means and against the mass in the container; means for resisting movement of said piston means in said container in a rearward direction while permitting movement of the piston means in a forward direction in the container; valve means movable relative to said closure means to open and close said outlet; actuating means operatively associated with said valve means and closure means for shifting said valve means to open position and for then forcing said closure means against the mass forwardly of said piston means to apply pressure thereto; and means for returning said valve means to outlet closing position and said closure means to its initial position.

7. In a dispenser for a fluent mass: a container for the mass; closure means for the container and having an outlet; a valve member inwardly of said closure means and movable relative to said container in an outward direction to close said outlet and in an inward direction to open said outlet; said closure means being movable with respect to said container to apply pressure to the mass therein and force it through said outlet; and actuating means operable from the exterior of said closure means for shifting said valve member inwardly of said closure means to open position whereby subsequent movement of said closure means relative to said container applies pressure to the fluent mass therein and forces a portion of said mass through the open outlet.

8. In a dispenser for a fluent mass: a container for the mass; closure means for the container and having an outlet; a valve member inwardly of said closure means and movable relative to said container in an outward direction to close said outlet and in an inward direction to open said outlet; and actuating means operable from the exterior of said closure means and movable relative to said container for shifting said valve member inwardly of said closure means to open position and for then forcing said closure means against the mass in said container to apply pressure thereto and force a portion of the mass through the open outlet.

9. In a dispenser for a fluent mass: a container for the mass; closure means for the container and having an outlet; piston means in said container movable in a forward direction toward said closure means and against the mass in the container; means for resisting movement of said piston means in said container in a rearward direction while permitting movement of said piston means in the container in a forward direction; valve means inwardly of said closure means and movable in an outward direction to close said outlet and in an inward direction to open said outlet; and actuating mean operable from the exterior of said closure means for shifting said valve means inwardly of said closure means to open position and for then forcing said closure means against the mass forwardly of said piston means to apply pressure thereto.

10. In a dispenser for a fluent mass: a container for the mass; closure means for the container sealingly mounted in said container and having an outlet and movable in a direction inwardly of said container against the mass to apply pressure thereto and dispense a portion of the mass through said outlet; actuating means connected to said closure means and slidable along the exterior of said container; means for closing said outlet; said closure means and actuating means being mounted on said container to be moved bodily therealong as a unit by the mass with said outlet closed and thereby permit automatic change in the effective volume of said container in accordance with variations in volume of the mass in said container due to change in the temperature of said mass.

11. In a dispenser for a fluent mass: a container for the mass; closure means for the container sealingly mounted in said container and having an outlet and movable in a direction inwardly of said container against the mass to apply pressure thereto and dispense a portion of the mass through said outlet; actuating means connected to said closure means and slidable along the exterior of said container; means for closing said outlet; said closure means and actuating means being axially slidable along said container as a unit by the mass with said outlet closed to thereby permit automatic change in the effective volume of said container in response to variation in the volume of the mass in said container due to temperature changes of such mass.

12. In a dispenser for a fluent mass: a container for the mass; closure means for the container having an outlet; piston means in said container movable in a forward direction toward said closure means and against the mass in said container; means for resisting movement of said piston means in said container in a rearward direction while permitting movement of the piston means in the forward direction; means for selectively opening and closing said outlet; said closure means being movable with respect to said container against the fluent mass therein to apply pressure thereto and force it through the outlet; said closure means being axially slidable on said container with said outlet closed to automatically change the effective volume of said container forwardly of said piston

means in response to variations in the volume of the mass in said container due to temperature changes of such mass.

13. In a dispenser for a fluent mass: a container for the mass; closure means for the container having an outlet; piston means in said container movable in a forward direction toward said closure means and against the mass in said container; means for resisting movement of said piston means in said container in a rearward direction while permitting movement of said piston means in the forward direction; means for selectively opening and closing said outlet; said closure means being movable with respect to said container against the fluent mass therein to apply pressure thereto and force it through the outlet; said closure means being axially slidable on said container to automatically change the effective volume of said container forwardly of said piston means in response to variations in the volume of the mass in said container due to temperature changes of such mass; the frictional resistance to axial sliding of said closure means on said container being substantially less than the frictional resistance to movement of said piston means forwardly in said container.

14. In a dispenser for a fluent mass: a container for the mass; an actuating head having an outlet and being slidable axially in said container to apply pressure to the fluent mass therein and force it through said outlet; a valve member inwardly of said head movable relative to said head in an outward direction to close said outlet and in an inward direction to open said outlet; actuating means extending through and shiftable with respect to said head and connected to said valve member to shift said valve member between open and closed positions, said actuating means being movable in one direction to shift said valve member to open position and to then shift said head axially in said container to apply pressure to the fluent mass therein; and means for shifting said actuating means in the opposite direction to first move said valve member to close position and then return said head to its initial position.

15. In a dispenser for a fluent mass: a container for the mass; an actuating head having an outlet and being slidable axially in said container to apply pressure to the fluent mass therein and force it through said outlet; a valve member inwardly of said head movable relative to said head in an outward direction to close said outlet and in an inward direction to open said outlet; actuating means extending through and shiftable with respect to said head and connected to said valve member to shift said valve member between open and closed positions, said actuating means being movable in one direction to shift said valve member to open position and to then shift said head axially in said container to apply pressure to the fluent mass therein; and spring means engaging said actuating means and engageable with said container for shifting said actuating means in the opposite direction to first move said valve member to closed position and then return said head to its initial position.

16. In a dispenser for a fluent mass: a container for the mass; an actuating head having an outlet and shiftable axially in said container to apply pressure in the fluent mass therein and force it through said outlet; a valve member inwardly of said head movable relative to said head in an outward direction to close said outlet and in an inward direction to open said outlet; piston means in said container movable in a forward direction toward said head and against the mass in said container; means for resisting movement of said piston means in said container in a rearward direction while permitting movement of the piston means in the forward direction; actuating means extending through and shiftable with respect to said head and connected to said valve member to shift said valve member between open and closed positions, said actuating means being movable in one direction to shift said valve member to open position and to then shift said head axially in said container to apply pressure to the fluent mass therein; and means for shifting said actuating means in the opposite direction to first move said valve member to closed position and then return said head to its initial position.

17. In a dispenser for a fluent mass: a container for the mass; an inner actuating head having an outlet and being slidable axially in said container to apply pressure to the fluent mass therein and force it through said outlet; a valve member inwardly of said head movable relative to said head in an outward direction to close said outlet and in an inward direction to open said outlet; an outer head slidable axially on said container; means extending through said inner head and connecting said outer head to said valve member to shift said valve member between open and closed positions, said outer head being movable from an initial position axially inwardly of said container to shift said valve member to open position and to then shift said inner head axially inwardly of said container to apply pressure to the fluent mass therein; and spring means engaging said outer head and engageable with said container for shifting said outer head axially outwardly of said container toward its initial position to first move said valve member to closed position and then return said inner head axially to its initial position.

18. In a dispenser for a fluent mass: a container for the mass; an inner actuating head having an outlet and being slidable axially in said container to apply pressure to the fluent mass therein and force it through said outlet; a valve member inwardly of said head movable relative to said head in an outward direction to close said outlet and in an inward direction to open said outlet; an outer head slidable axially on said container; means extending through said inner head and connecting said outer head to said valve member to shift said valve member between open and closed positions, said outer head being movable from an initial position axially inwardly of said container to shift said valve member to open position and to then shift said inner head axially inwardly of said container to apply pressure to the fluent mass therein; spring means engaging said outer head and engageable with said container for shifting said outer head axially outwardly of said container toward its initial position to first move said valve member to closed position and then return said inner head axially to its initial position; stop means on said outer head engaging said spring means when said outer head is in its initial position to prevent said spring means from bearing against said container and to permit said head to float as a unit axially of said container in response to changes in volume of the fluent mass due to temperature changes of said mass.

19. In a dispenser for a fluent mass: a container for the mass; an inner actuating head having an outlet and being slidable axially in said container to apply pressure to the fluent mass therein and force it through said outlet; a valve member inwardly of said head movable relative to said head in an outward direction to close said outlet and in an inward direction to open said outlet; an outer head slidable axially on said container; means extending through said inner head and connecting said outer head to said valve member to shift said valve member between open and closed positions, said outer head being movable from an initial position axially inwardly of said container to shift said valve member to open position and to then shift said inner head axially inwardly of said container to apply pressure to the fluent mass therein; spring means engaging said outer head and engageable with said container for shifting said outer head axially outwardly of said container toward its initial position to first move said valve member to closed position and then return said inner head axially to its initial position; and coengageable stop means on said container and one of said heads for limiting the extent of shifting said heads in a direction axially outwardly of said container.

20. In a dispenser for a fluent mass: a container for the mass; an inner actuating head having an outlet and shiftable axially in said container to apply pressure to the

fluent mass therein and force it through said outlet; piston means in said container movable in a forward direction toward said inner head and against the mass in said container; means for resisting movement of said piston means in said container in a rearward direction while permitting movement of said piston means in the forward direction; a valve member inwardly of said head movable relative to said head in an outward direction to close said outlet and in an inward direction to open said outlet; an outer head slidable axially on said container; means extending through said inner head and connecting said outer head to said valve member, said outer head being movable from an initial position axially inwardly of said container to shift said valve member to open position and to then shift said inner head axially inwardly of said container to apply pressure to the fluent mass therein; spring means engaging said outer head and engageable with said container for shifting said outer head axially outwardly of said container toward its initial position to first move said valve member to closed position and then return said inner head axially to its initial position; stop means on said

outer head engaging said spring means when said outer head is in its initial position to prevent said spring means from bearing against said container and to permit said heads to float axially of said container in response to changes in volume of the fluent mass due to temperature changes of said mass; and coengageable stop means on said container and one of said heads for limiting the extent of shifting of said heads in a direction axially outwardly of said container.

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