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VALVE CONSTRUCTION OF PRESSURIZED DISPENSERS

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Fig. 1

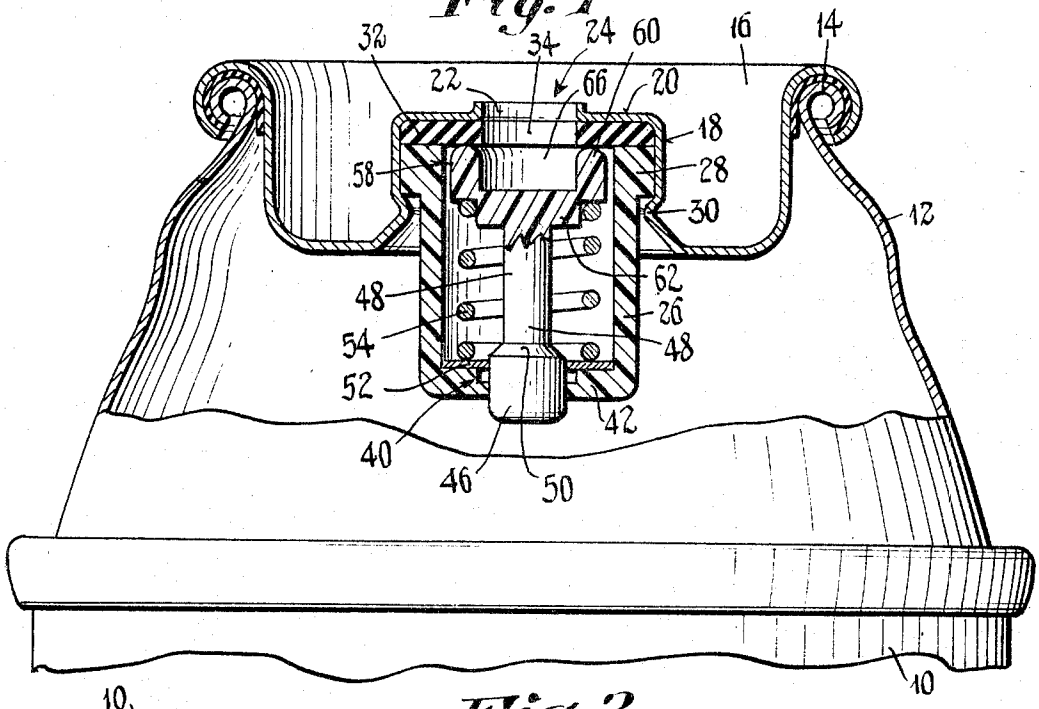
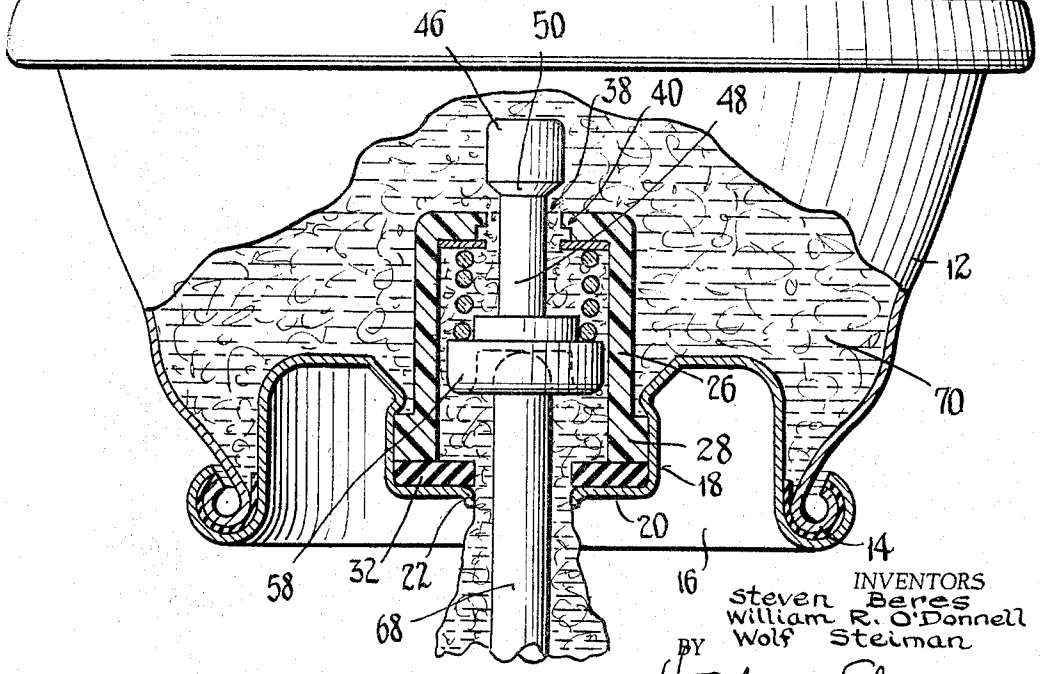



Fig. 2




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# VALVE CONSTRUCTION OF PRESSURIZED DISPENSERS

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This invention relates to small pressurized dispensers of the kind commonly held in the hand when in use and which are adapted to dispense viscous and/or lumpy substance such as foods, etc. The invention relates more particularly to the control valves of the above devices.

An object of the invention is to provide a novel and improved valve construction for a pressurized dispenser, which construction is especially adapted to control satisfactorily the flow of viscous, lumpy or other flowable but difficult-to-handle substances.

Another object of the invention is to provide an improved valve construction as above set forth, which tends to break up lumps or similar particles in the flowable substance as the flow is being shut off, thereby to maintain an effective closing action under adverse conditions of use.

A further object of the invention is to provide an improved valve construction in accordance with the foregoing wherein a double closure at two separated points is had, to render more efficient the seal effected by the valve.

A feature of the invention resides in the provision of an improved valve construction of the type identified, wherein the separated closures are of a different nature one from the other, thereby to employ different modes of closing in but a single valve construction.

Another feature of the invention resides in the provision of an improved valve construction as outlined, wherein one closure involves an abutting type valve and seat especially able to withstand great pressures, whereas the other closure involves a slide valve structure noted for a smooth action and for its lump-breaking ability.

Yet another object of the invention is to provide an improved pressure-withstanding flow control valve as characterized, which is sanitary, especially simple in its construction, which requires but few parts of the kind economically fabricated and assembled, and which is rugged, simple and reliable in its operation.

Other features and advantages will hereinafter appear.

In the drawings accompanying this specification, similar characters of reference are used to designate like components throughout the several views, in which:

FIG. 1 is an axial sectional view of the improved valve construction as provided by the invention, mounted on a container with the parts shown in the closed or sealing position.

FIG. 2 is a view similar to that of FIG. 1 but showing the container and valve construction in inverted position with the valve shifted to its open position for permitting a flow of the substance which is to be dispensed.

As shown, the improved valve construction is adapted to be mounted on a pressurized container **10**, such container having a viscous food or other product which is maintained under continual pressure for the purpose of propelling the substance through a discharge orifice to enable convenient dispensing to be had. The container **10** may be of any suitable type, that shown having a generally conical reduced upper neck portion **12** provided with a curled top lip **14** to which there is sealingly attached a metal mounting cup **16** in the conventional manner. The mounting cup **16** has a raised central portion



**18** including a top wall and surface **20** in which there is a discharge orifice **22** having a central opening **24**.

Mounted below and on the cup **16** is a valve housing **26** which is preferably constituted of resilient plastic substance such as linear polyethylene or the like. The valve housing **26** is cup-like and has an upper thickened rim **28** held captive in the mounting cup portion **18**, as by means of an annular crimp **30** or the equivalent. The rim **28** of the valve housing **26** clamps a flat valve washer **32** against the top wall **20** of the mounting cup **16**, said washer having a bore **34** which is aligned with the opening **24** in the top wall.

In accordance with the present invention, a novel dual valve construction is provided in the housing **26**, said construction being especially adapted to advantageously control the flow of viscous, lumpy or other similar flowable but difficult to handle substances. The improved dual valve construction is so organized and arranged that it tends to break up lumps or similar particles in the flowable substance as the flow is being shut off, thereby to maintain an effective closing action even with difficult-to-handle substances.

The valve construction provides a double closure, that is, a closure at two separated points in the housing **26**, said closures further being of a different nature and employing different modes of sealing. One closure involves an abutting type valve and seat which is especially able to withstand great internal pressures in the container whereas the other closure involves a slide type valve having a smooth action and also the ability to break up lumps.

Referring to FIGS. 1 and 2, the multiple valve construction illustrated therein comprises an inner valve means constituted of a bottom opening **38** having a stepped edge **40**, said opening being provided in the bottom wall **42** of the housing **26**. Cooperable with the stepped edge **40** of the bottom opening is a cylindrical resilient plastic valve head **46** carried by an actuator means or stem **48** which latter is vertically movable in the housing **26**. The valve head **46** has a tapered leading edge or portion **50** which is cooperable with the sharp lower edge of the bottom opening **38** and which thus tends to break up lumps or other particles that might exist in the substance being dispensed.

The inner valve means also comprises a rigid flat washer **52** which is disposed against the inside of the bottom wall **42** and is yieldably held in place by a helical compression type valve return spring **54**. The valve washer **52** has its bore aligned with the bottom opening **38** of the valve housing **26** as shown, and also presents a sharp edge which is cooperable with the sloping portion **50** of the valve head **46** to further effect a breaking up of lumps or particles in the substance being dispensed. Such crushing or breaking action occurs when the valve head **46** is being shifted from the open-valve position of FIG. 2 to the closed-valve position of FIG. 1, as will be understood.

The invention further provides an outer valve means comprising the valve washer **32** and a cup-like or annular valve member **58** having an annular rim portion **60** which is engageable with the valve washer **32**, the member **58** having a bottom wall **62** which is attached to the valve stem or actuator means **48**. As seen in FIG. 1, the annular rim **60** of the outer valve means abuts the bottom surface of the valve washer **32** whereby such valve means constitutes an abutting type closure. In contrast to this, the inner valve means comprising the head **46** and the stepped edge **40** of the housing bottom **42** comprises a slide type valve means.

The recess or cavity **66** of the valve cup **58** is commensurate in size with the opening **34** in the valve washer **32**, and as seen in FIG. 2 the said recess and opening will accommodate a valve actuating or opening pin **68**, which

is utilized to open the dual valve construction when it is desired to dispense the substance (indicated at **70** in FIG. 2) which is contained under pressure in the container **10**.

The valve return spring **54** engages the underside of the valve cup **58**, as seen in FIG. 1, for the purpose of yieldably holding the valves in their closed positions shown in this figure. Under the action of the valve opening pin **68** the return spring **54** is compressed as the valves are shifted to the open positions, all as shown in FIG. 2.

By the above construction several important advantages are had in controlling the substance **70**. The abutting type outer valve means comprising the ring **60** and washer **32** are extremely effective in sealing the container, since the internal pressure of the container aids the return spring **54** in maintaining the ring or annulus **60** tightly engaged with the seat member or washer **32**. The sleeve type valve comprising the head **46** and the sharp edges of the opening **38** and rigid washer **52** has a smooth action whereby it does not interfere with movement of the valves, as for example the return action under the urging of the spring **54**. Further, the slide valve arrangement, by virtue of the sloping shoulder portion **50** of the head and the sharp cooperable edges on the valve housing **26**, tends to break up lumps and particles which might exist in the substance **70** which is to be dispensed. In addition, a free flow of the viscous substance is had by virtue of the appreciable clearances existing when the valve construction is in the opened condition as seen in FIG. 2.

Relatively few parts are involved in effecting the double seal and other functions. The valve construction may be economically fabricated, is simple to use and reliable in operation over an extended period of time. Since no protruding parts exist which might cause inadvertent actuation or opening of the valve means, the construction illustrated herein is foolproof and not likely to be accidentally operated so as to waste the contents of the container. All of the contained substance located below the outer sealing annulus **60** will be retained under pressure and will be kept from contact with the external atmosphere or oxygen of the air, thereby retarding spoilage to the maximum possible extent. If desired, any residue from a previously dispensed portion which might exist in the cavity **66** and orifice opening **34** may be readily washed away, as with a pressure water spray, without fear of contamination of the contents within the valve construction and the container. Thus, the device is sanitary, and may be readily kept clean prior to being put away for storage.

Variations and modifications may be made within the scope of the claims, and portions of the improvement may be used without others.

We claim:

**1.** In a pressurized container for dispensing viscous and lumpy substances, a valve construction comprising, in combination:

(a) a valve housing having a passage through which the dispensed substance passes,

(b) a pair of valve means controlling the flow of substance through said passage at separated inner and outer points, said valve means including movable members, and

(c) common actuator means connecting the movable members of the valve means for simultaneous movement,

(d) said valve means being open at the same time for one position of the actuator means and being closed at the same time for another position of the actuator means,



(e) said housing being of resilient plastic material,

(f) the inner valve means comprising:

(1) a bottom opening in the housing, said opening having a sharp stepped edge,

(2) a cylindrical resilient plastic valve head on the actuator means, receivable and closely sealingly fitting in the said stepped opening of the housing,

(g) the outer valve means comprising:

(1) a resilient valve washer clamped against the outer end of the valve housing,

(2) an annulus carried by the said common actuator means,

(h) a transverse end wall on the actuator means, spanning and closing the bore of the valve annulus,

(i) a rigid valve washer in the housing at the said bottom opening thereof and engaged with the housing bottom, said washer having a sharp inner edge,

(j) said cylindrical valve head being receivable in and closely sealingly fitting the opening of the rigid washer,

(k) said rigid washer and the stepped edge of the bottom opening forming between them an annular sealing space for trapping and holding substance from the container,

(l) said plastic valve head, when sealingly engaging the rigid washer and the stepped edge of the bottom housing opening, effecting a closure of said annular sealing space and preventing egress of trapped substance therefrom.

**2.** A valve construction as in claim **1**, wherein:

(a) the cylindrical valve head has a tapered leading surface engageable consecutively with the sharp edges of the housing bottom opening and the edges of the rigid washer to break up lumps in the substance being dispensed.

**3.** A valve construction as in claim **2**, wherein:

(a) there is a valve return spring in the housing,

(b) said spring bearing against and yieldably holding the rigid washer in place and engaged with the housing bottom.

**4.** A valve construction as in claim **1**, wherein:

(a) the housing has a discharge orifice adapted to admit a valve-opening pin,

(b) the outer valve means comprises:

(1) an annular valve seat surrounding the opening of the discharge orifice,

(2) a valve cup engageable with the valve seat, said cup having a recess adjacent and aligned with the opening of the orifice to receive the said valve-opening pin.


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