United States Patent [19]

Chappell

[11] **3,809,293**

[45] **May 7, 1974**

[54] **DISPENSER HAVING AIR VENT CLEAN-OUT**

[75] Inventor: **Albert R. Chappell,** Jerseyville, Ill.

[73] Assignee: **The Metalife Company,** Wentzville, Mo.

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[52] **U.S. Cl.** **222/148,** 222/181

[51] **Int. Cl.** **B67d 5/42**

[58] **Field of Search** ..... 222/181, 88, 148, 149, 222/151, 86, 83.5, 478, 481, 481.5; 220/44 R

[56] **References Cited**

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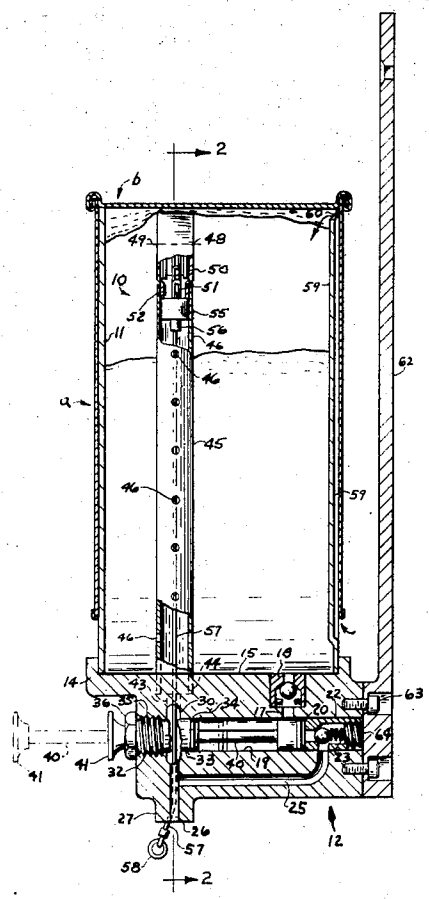
2,818,998	1/1958	Jones	222/185 X
3,002,659	10/1961	Woodis	222/149
3,950,813	8/1960	Koones	220/44 R X

Primary Examiner—Robert B. Reeves
Assistant Examiner—John P. Shannon

[57] **ABSTRACT**

For using dispensers of the type in which a first can of semi-fluid hand cleaner or similar viscous substance is filled into a dispenser sleeve, and then a second can of the substance is inverted and applied telescopingly over the sleeve, accumulation of the substance in the internal vent tube of a large size dispenser may make it difficult to remove and replace cans, and may interfere with air inflow necessary for dispensing. In the present invention, air inflow, to permit removal of such a first can, is assured by a pull-down piston in the vent tube to drive any clogging substance out through the nozzle passage. On applying a second full can over the sleeve, the cleaned tube permits easy expulsion of intervening air. Even while the tube is clogged, dispensing may proceed normally; a groove leading downward on the outer side of the sleeve permits continuing inflow of air.

1 Claim, 2 Drawing Figures



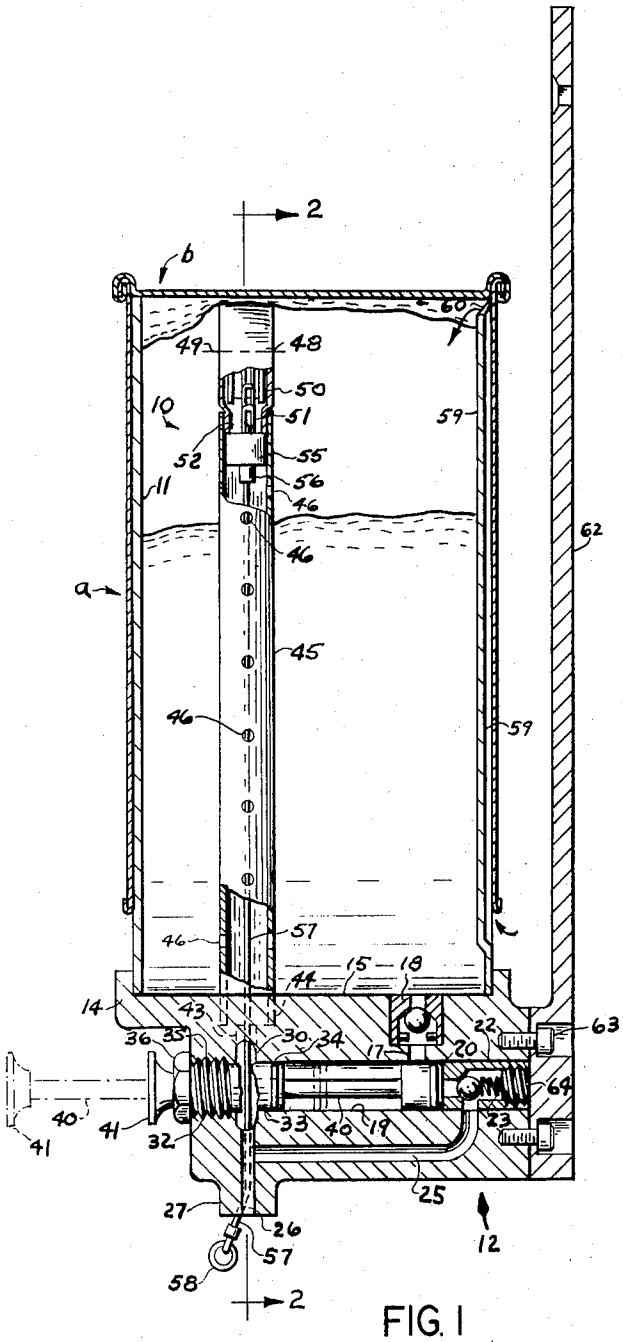

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FIG. 1

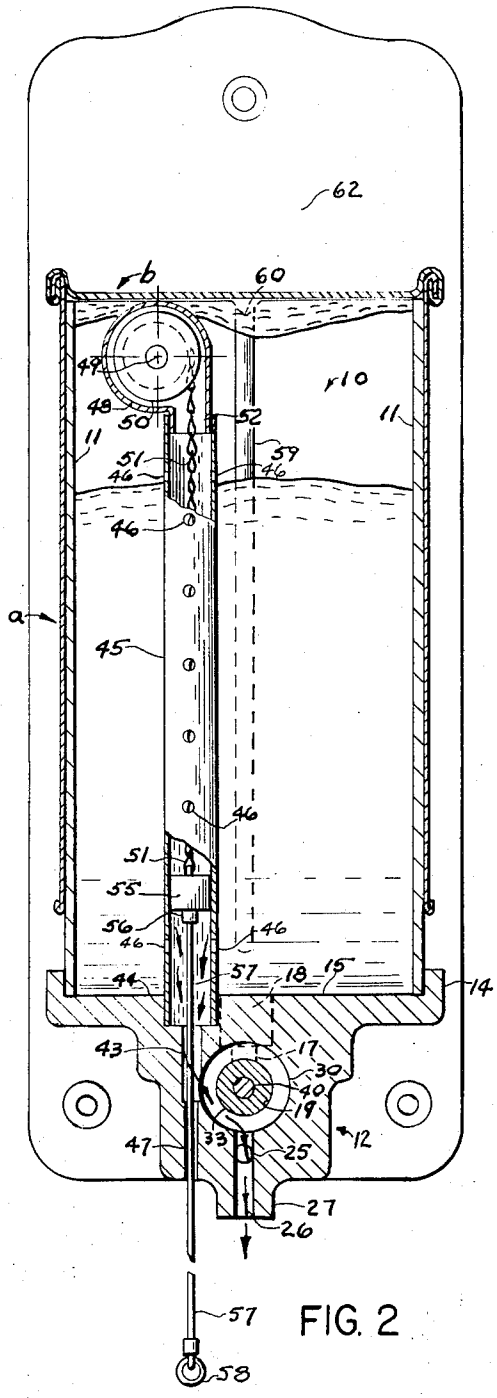

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FIG. 2

DISPENSER HAVING AIR VENT CLEAN-OUT

BACKGROUND OF THE INVENTION

This invention relates to dispensers for semi-fluid substances, such as hand cleaner packed in cylindrical cans which are applied telescopingly over a sleeve-like wall of a dispenser having an air vent tube, as generally shown in U.S. Pat. Nos. 2,751,128 and 2,818,998. The present invention has particular applicability in adapting such a dispenser to large capacity telescoping cans.

This type of dispenser requires air inflow for continued dispensing after a can has been fully telescoped on the dispenser sleeve. Without such air inflow, and with the substance itself sealing the space between the sleeve and a fully telescoped can, such substance could not then be dispensed, in the absence of a pressure-applying augur. This dispensing problem contrasts with dispensing while the can is descending telescopingly over the sleeve; in this phase the semi-fluid substance is dispensed without air inflow.

Difficulties in using this type of dispenser, not serious when small size dispensers and cans were used, have been encountered when using large capacity dispensers which accommodate cans of from about five to ten pound capacity. These difficulties have been as follows: When a first can has been inverted over the dispenser sleeve and its contents transferred into it and while the sleeve is still quite full, the force required to lift up the emptied inverted can has been too great for ready handling. Further, to apply a full can over such substantially full sleeve, and drive out the intervening air, has not only been difficult but sometimes resulted in expulsion of part of the dispenser contents through the nozzle.

I have found that these difficulties arise from accumulation of the substance in the vent tube, from various causes.

SUMMARY OF THE INVENTION

In the present invention, such clogging is relieved in two ways. For changing cans, I provide the air vent tube with a pull-down piston, to be operated before the inverted can is removed. After cleaning out the tube with the piston, when the maintenance man starts to lift the can, air may flow upward through the tube, to permit the can to be raised. Likewise a replacement can may be easily forced down over the dispenser sleeve, forcing out air through the clean tube. For air inflow during operations after the dispenser can has bottomed on the sleeve edge, accumulation of substance in the vent tube does not require any clean-out. Instead I provide an air-flow inlet groove in the side of the sleeve; through it air may enter as the substance is gradually dispensed.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view principally in section of a dispenser embodying the present invention, with its sleeve nearly filled with a substance to be dispensed, as supplied in a can shown inverted and telescoped over the sleeve; also showing vent-tube clean-out piston in released position.

FIG. 2 is a sectional view taken along line 2—2 of FIG. 1, showing the vent-tube clean-out piston in pulled-down position.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A dispenser generally designated **10** and incorporating the preferred embodiment of the present invention, is designed specifically for dispensing semi-fluid cream-like hand cleaner of fairly viscous consistency. Such hand cleaner may be marketed in a cylindrical can generally designated *a*, to fit telescopingly downward over the outside of a vertical cylindrical dispenser sleeve **11**, sized to fit slidingly within the can.

The principal member of the dispenser **10** is a dispenser base generally designated **12**, preferably formed of cast aluminum. Below a sleeve-receiving flange **14**, the base **12** has a thick bottom **15** which in effect closes the lower end of the sleeve **11**.

The means to discharge the dispenser contents through the base **12** are conventional, and are best seen in FIG. **1**. Set in a vertical passage **17** in the bottom **15**, near the rear of the base **12**, is a ball check valve **18** which opens into a horizontal cylindrical passage **19** in which is fitted a main operating piston **20** having an O-ring seal **21**. At the rear of the end of the passage is second ball check valve **22**, having a spring **23** to urge it closed. Beyond the second ball check valve **22**, a downward and forward extending dispensing passage **25** leads to a vertical nozzle passage **26**, formed in a nozzle **27** which extends downwardly along a vertical axis which intersects the central axis of the horizontal cylindrical passage **19**. At the intersection of these passages, I provide a laterally enlarged chamber **30** as seen in FIG. **2**. The forward end of the horizontal cylindrical passage is closed by the forward threaded end **32** of a rod guide **33** having an O-ring seal **34** aft of the chamber **30**. The forward threaded end **32** is mounted in the tapped forward opening **38** of the cylindrical passage **19**, as seen in FIG. **1**, and secured by a lock nut **36**.

Through a drilled bore in the guide **33**, a closely fitted discharge rod **40** passes; on its projecting forward end is a handle **41** to reciprocate the operating piston **20** within the cylindrical passage **19**, by moving it from its normally closed position shown in solid lines in FIG. **1** to an extreme forward position there shown in phantom lines, and then returning it backward to the solid line position. By such operation, the substance in the dispenser sleeve **11** is to be drawn through the first check valve **18** into the passage **19** as the piston **20** is pulled out. When it is pressed backward, its pressure on the substance in the passage **19** closes the first check valve **18** and forces the substance back through the second check valve **22**, driving it through the dispensing passage **25** forwardly to and through the downward passage **26** in the dispensing nozzle **27**.

In the present invention, as illustrated in FIG. **2**, the laterally enlarged chamber **30** extends sideward, serving as a cross-flow portion to intersect the lower end of an upper passage portion **43** which extends downward from a well **44** in the upper surface of the dispenser bottom **15**. In the well **44** is concentrically mounted a vertical air vent tube **45** having horizontal air vent passages **46** through its side wall at various elevations. Aligned vertically with the upper passage portion **43** and extending downwardly from the lateral chamber **30** to the exterior of the base **12** is a narrow bored cable passage **47**.

The air vent tube **45** is generally of the type shown in said prior U.S. Pat. No. 2,818,998. However, at its

upper end is a circular sheet metal casing **48** shown broken away in FIG. **2.** Mounted within the casing **48** on a forward and aft axis is a spring-returned reel **50** on which a flexible chain **51** is wound. A tangential outlet **52** of the casing **48** extends downward for mounting within the upper end of the vent tube **45.** At the end of the chain **51** within the vent tube **45** is a cylindrical clean-out piston **55,** having at its lower end a projecting neck **56** in which is crimped the upper end of the cable **57.** The cable **57** extends downward through the vent tube **45** and upper passage portion **43** and through the left side of the laterally enlarged chamber **30** as seen in FIG. **2,** and thence down through the narrow cable passage **47** to the exterior, where its end has a small pull ring **58.**

The clean-out piston **55** and its pull cable **57** serve to clean out the vent tube, for the reasons hereinafter described, by pulling it downward from its uppermost FIG. **1** position to the clean-out position shown in phantom lines in FIG. **2,** from which it is returned upwardly by the chain **51** pulled by its spring-operated reel **50.**

The sleeve **11** held in the flange **14** of the base **12** has an outer diameter sized to permit close telescoping fit of a cylindrical can *a.* However, at its back side the sleeve **11** is not precisely cylindrical; it has a vertical groove **59** which may be rolled or formed in any other convenient manner, extending upwardly from the dispenser base flange **14** to an upper end air-flow notch **60** which communicates with the inside of the sleeve.

The dispenser base **12** is mounted to a back plate **62** by counter-sunk screws **63.** The back plate **62** abuts against a short threaded member **64** which closes the second check valve **22** in place at the back end of the horizontal passage **19.** The back plate **62** is used for mounting the dispenser **10** on a wall or standard, at a convenient height for use.

The figures illustrate a typical condition of such a dispenser after use to the extent that the can *a* has fully telescoped, to rest on the upper edge of the dispenser sleeve **11,** with some of the substance still adhering to the inverted can bottom *b.* If a maintenance man then attempts to replace the can *a* with a full can, with the sleeve **11** still nearly full, he may encounter difficulty. Specifically, the vent tube apertures **46** may be sealed off by clogging at or below them; likewise the vertical groove **59** may be sealed off.

The clogging tendency so described is not entirely predictable. It varies with the viscosity of the substance to be dispensed, the extent to which it may liquefy with exposure to air, and the rate at which it is used. When such clogging does occur, it proves to be of serious difficulty. Thus with the atmospheric pressure of the air exerted down on the can bottom *b,* the maintenance man will not find it possible to lift the can *a* until he can break the sealing tendency of the substance in the vent tube **45** and groove **59.**

In the present invention, the maintenance man simply pulls downward on the ring **58** and permits it to be retracted upward by the spring reel **50.** On pulling the ring **58** downward as shown in FIG. **2** any substance clogging the tube **45** will be dislodged and driven out through the upper passage portion **43,** then across through the enlarged chamber **30** and down through the nozzle passage **26.** Thereafter the can *a* may be lifted, the air flowing in readily through the tube **45** and out those of its apertures **46** above the level of the substance within the sleeve **11.**

After the can *a* has been removed, a similar can filled with the semi-fluid substance may be positioned inverted over the sleeve **11** and pressed downward. In so doing, air above the level of fill within the sleeve will have to be forced out through those apertures **46** above the substance in the sleeve **11.**

Should the vent tube **45** become clogged during that phase of dispensing after the can *a* has bottomed on the sleeve **11,** air may nevertheless enter to maintain the atmospheric pressure within the dispenser **10,** so that dispensing may continue unimpeded. Such air will enter the groove **59** at its lower end and enter the sleeve **11** through the notch **60.** If any substance adhering to the bottom of the can *a* blocks the notch **60,** the partial vacuum created by drawing the plunger **40** outward will dislodge it, permitting air inflow as shown by the arrow in FIG. **1.** Thus there is no need to clean out the vent tube **45** except immediately prior to removing an emptied can *a.*

The present invention thus overcomes the obstacles which have heretofore required pressure augurs, or other pressure-applying mechanism, to squeeze semi-fluid substances from large-capacity dispensers.

I claim:

1. A dispenser for semi-fluid substances packed in cylindrical cans, comprising

a substantially vertical cylindrical sleeve whose outer diameter is sized to fit slidingly within such a cylindrical can,

a dispenser base closing the lower end of said sleeve, said base including means to discharge the sleeve contents therethrough including a nozzle having a discharge passage, and

a tubular air vent tube having a substantially vertical axis and lateral air passages at a plurality of levels, the air vent tube being mounted to extend upwardly from said dispenser base into the upper portion of the sleeve,

the dispenser base having a connecting passage from the lower end of the air vent tube to an inner part of said nozzle passage,

characterized in that

the air vent tube has clean-out means movable downwardly from its upper end to said connecting passage,

whereby to permit removal, from the air vent tube to the nozzle, of such semi-fluid substance which may have accumulated therein, thereby to facilitate air inflow through said nozzle and the air vent tube and through its lateral air passages into the dispenser sleeve, and wherein

the said connecting passage includes an upper passage portion aligned with the axis of said air vent tube, and the air vent tube and the said upper passage portion are offset laterally from the nozzle discharge passage, and

the connecting passage further includes a cross-flow portion connecting to the nozzle passage, the dispenser base further having

a pull cable passage on said vent tube axis extending downwardly beneath said cross-flow portion to the exterior, and wherein

the said clean-out means includes a piston fitted slidably within said tube and upper passage portions, and the piston has a pull cable extending downwardly along the tube axis through said vertical passage portions to the exterior and further has return spring means connected to the upper end of the vent tube.

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