Aug. 1, 1967 C. D. WALLER 3,333,740

SCREW ACTUATED DISPENSER

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Fig. 1.

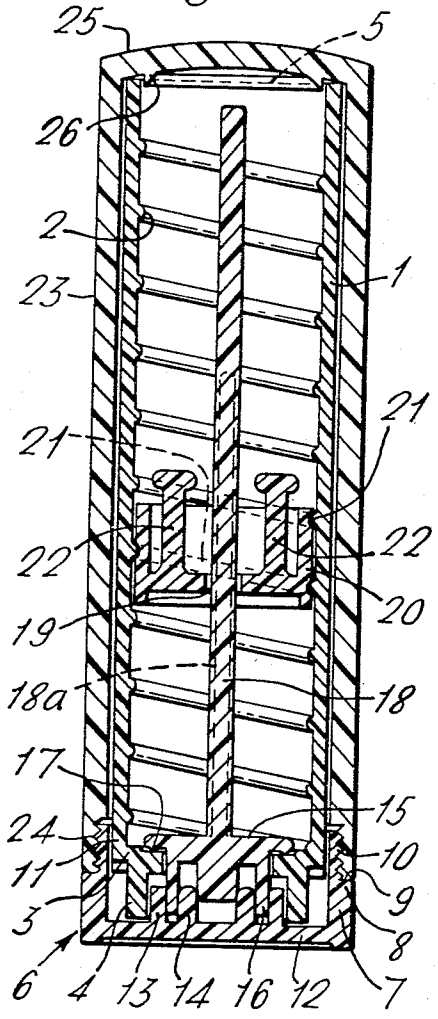
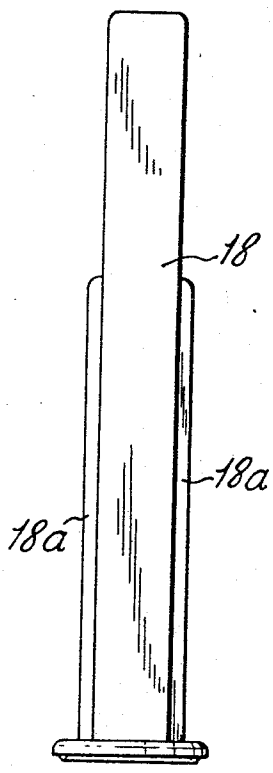


Fig. 2.



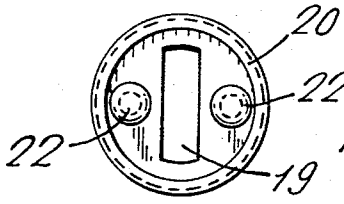


Fig. 3.

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SCREW ACTUATED DISPENSER

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ABSTRACT OF THE DISCLOSURE

A dispenser for viscous or semi-solid substances, e.g., substances in paste, gel or like form where the substance is contained in a tubular case member having a bottom closure member comprising a stem extending along the interior of the case member and rotatable with the closure member relatively to the case member to displace a follower which is apertured for the passage therethrough of the stem and is non-rotatable relatively to the stem and which propels the substance when the case member is gripped and the closure member rotated; the periphery of the follower and the internal peripheral surface of the case member having co-operating helical screw engagement to cause axial displacement of the follower during relative rotation between the case member and the closure member; the improvement being that sealing means is provided between the said relatively rotatable case and closure members at the bottom of the case member, and a deep cap member screw-threaded at its open bottom end co-operates with an external screw-thread on the said closure member and the crown of said cap member and the upper end of the said case member are arranged to co-operate in sealing relation and form a leak-tight closure when the cap member is screwed home; relative rotation between the cap member and the displacement of the substance from the case member being precluded until the cap-member is screwed-off the closure member.

The case member may advantageously be made of a resilient plastics material such as polythene and enclosed in a more rigid plastics housing e.g., of styrene and hitherto such dispensers have been made with the case tightly fitted into a surrounding housing having a small top closure cap screwed to the body of the housing, the bottom closure member being rotatable and having a stem which is surrounded by the substance and retains the follower against rotation relative to the stem while the follower is being propelled along the case.

Such dispensers are largely used for containing and dispensing cosmetics and the case is usually filled by pouring in the substance while hot, the substance setting when cooled to a semi-solid or highly viscous mass. The external periphery of the housing is usually provided with indicia, e.g., hot-branded in gold foil or screen-printed in ink or the like, and inasmuch as filling has normally to occur with the housing present about the case, there is a danger of the hot substance spilling over the printed surface of the housing. Furthermore air locks may form in the filled substance which cannot be detected where, as is usually the case, the housing is of opaque material. Voids may also inadvertently appear in the mass and cannot be seen during filling.

A further disadvantage of existing dispensers of the type referred to is that with the case closed by the housing and a top cap the propelling means may be operated and discharge the substance from the case into the cap, which results in an undesirable messing of the interior of the cap and possibly of the housing.

The object of the present invention is to obviate the foregoing disadvantages.

One embodiment of a dispenser by way of example according to the invention will now be described with reference to the accompanying drawings.

In the drawings, FIG. 1 is a sectional elevation of the dispenser; FIG. 2 is a stem component thereof and FIG. 3 a plan view of the follower component thereof.

The dispenser comprises a case member **1** the internal wall of which is formed with a helical rib **2**. The case member is of tube form with an internal flange **3** and an axially-extending boss **4**. The tube has an open end **5** and is of a translucent or transparent plastics material, e.g., polythene.

The other end of the tube is closed by a closure member **6** comprising a cup element **7** the peripheral wall **8** of which is shouldered down at **9** and screw-threaded at **10** and surrounds the lower end portion **11** of the tube with some clearance.

From the base **12** of the cup co-axial ring portions **13** and **14** project towards the interior of the tube which is freely rotatable about the outer one of said portions.

The closure member includes a disc portion **15** which is provided with a depending circular boss portion **16** which is adhesively or otherwise firmly secured between the two ring portions aforesaid. The said disc has an annular rib **17** which may be of rounded or tapering cross section sealingly to engage the inturned flange **3** of the tube. Upstanding from the said disc is a stem **18**. The stem is arranged to extend along the axis of the tube and is of blade like form (see FIG. 2) with sidewing portions **18a**.

The said stem passes through a slot **19** in a follower **20** which is of cup-like form and the peripheral wall of which is externally formed with a helical groove **21** matching the helical rib **2** on the inner surface of the tube. Upstanding from the base of the cup-like follower are headed post elements **22** for the purpose hereinafter described.

A deep cap member **23**, e.g., of a rigid plastics material such as styrene and preferably of an opaque character, is fitted with clearance over the tube **1** and at its lower end it is internally screw-threaded at **24** to co-operate with the screw-thread **10** of the bottom closure member **6**. The internal face of the crown **25** of this deep cap is formed with a rib **26** of tapering or rounded cross section to fit with some pressure in the open end of the tube so as to engage the inner edge of that end of the tube and promote an effective seal.

The case member has to be filled before the deep cap is applied. The case member will have been fitted with its bottom closure member **1** and the follower and prior to filling, the case member and the bottom closure member are operated e.g., by gripping the case member and rotating the bottom closure member so that the follower **20** is brought to the closure end of the tube. The substance whilst hot is then poured into the case member up to the level therein desired. The case member being of a translucent or transparent material the filling of the case member can be visually inspected. The substance cools to a semi-solid form.

The deep cap is applied with a clearance over the case member and the deep cap and the bottom closure member are screwed together to the position shown in FIG. 1.

For dispensing the substance the deep cap must be removed. The case member can then be gripped and the bottom closure member turned, thus rotating the stem and consequently the follower so that the latter screws along the interior of the case member with its helical groove engaging the helical rib on the inside of the case to project the substance like a stick from the open end of the case member. By reverse relative rotation the follower will be drawn back towards the bottom end closure and drag the substance back with it into the case member, the headed post elements **22** acting like anchor-

ing elements to keep the substance and the follower as a unitary whole.

With the deep cap applied the substance is effectively sealed in the case member by virtue of the engagement of the sealing rib **26** with the open end of the case member and the engagement of the sealing rib **17** on the disc with the lower inturned flange **3** of the case member.

By providing the deep cap to make screw engagement with the bottom closure member, the said cap can be screwed home and the bottom closure prevented from rotation in a direction tending to displace the substance through the open end of the case member. Rotation in the opposite direction while the deep cap is gripped merely unscrews the bottom closure member with the case member as a whole and the follower becomes inoperative. Even if some relative movement of the follower within the case member is permitted it may merely result in the following receding further into the case member.

If desired the open mouth of the case member may have a closure wall provided with an extrusion aperture and the crown of the deep cap may have a conical or other closure plug engaging said aperture when the said cap is screwed home.

What I claim is:

1. A dispenser suitable for dispensing a substance in viscous or semi-solid form, comprising a tubular case member for the substance to be dispensed, a bottom closure member comprising at least one stem extending along the interior of the case member, a follower apertured for the passage therethrough of the stem and non-rotatable relatively to the stem and displaceable along the stem behind the substance for propelling the latter from said case member, the periphery of the follower and the internal peripheral surface of the case member having co-operating helical screw engagement and said members being relatively rotatable to effect the said displacement of the follower, sealing means between said relatively rotatable members and sealing the bottom of said tubular case member, a deep cap member, said cap member being screw-threaded at its open end and said bottom closure

having a co-operating screw thread means, the crown of said cap member and the upper end of said case member being arranged to co-operate in sealing relation and form a leak-tight closure by screwing home the cap member, said bottom closure member and said cap forming a closure round the said case so that until the said cap has been screwed off the bottom closure member, relative rotation between such members which would displace the substance from the case is precluded.

2. A dispenser according to claim **1** in which said bottom closure member comprises an externally screw-threaded wall and its inner peripheral surface surrounds the lower end of the case.

3. A dispenser according to claim **1** in which the case has an inwardly extending base flange element and the stem of the closure member rises from a base disc element of said member, one of said elements being provided with an annular sealing rib engaging with the other element.

4. A dispenser according to claim **1**, in which the inner surface of the crown of said deep cap member is provided with an annular rib for sealingly engaging the mouth of the case member.

5. A dispenser according to claim **1**, in which said follower is a cup-shaped element having anchoring means within the element assisting to hold the substance to the cup.

6. A dispenser according to claim **1**, in which said tubular case member is of a resilient plastics material and said deep cap member is of a relatively rigid plastics material.

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