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Stevenson

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[54] **DISPENSER AND SLIDE VALVE FOR USE THEREIN**

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[52] **U.S. Cl.** **222/181,** 222/561

[51] **Int. Cl.** **B67d 3/00**

[58] **Field of Search** 251/144, 326; 222/559–561, 181, 185

[56] **References Cited**

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[57] **ABSTRACT**

Apparatus for the gravity assisted dispensing of selected quantities of viscous fluids is disclosed. The dispensing apparatus includes a slide valve having a slide member shaped to cooperate with a dispensing aperture to terminate flow without any excess as the valve is operated in the closing direction. The slide member further carries an O-ring seal which circumscribes the dispensing aperture to prevent leakage with the valve in the fully closed position. Spring pin means is provided to limit the movement of the slide member in at least a first direction and to retain the slide member in a cooperative relationship with the remainder of the dispenser.

10 Claims, 4 Drawing Figures

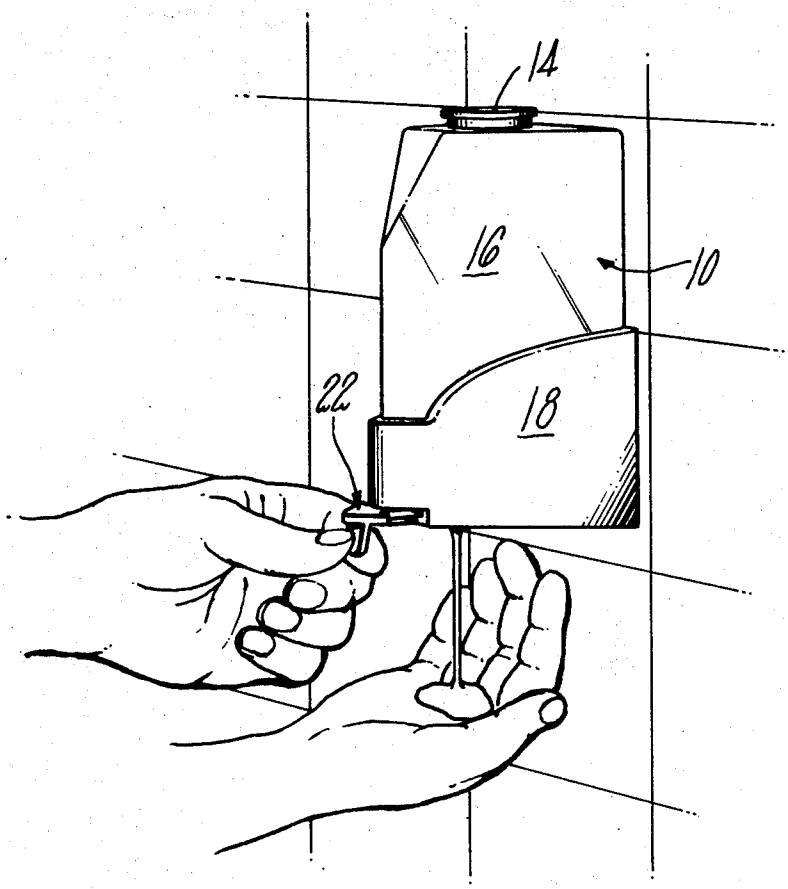
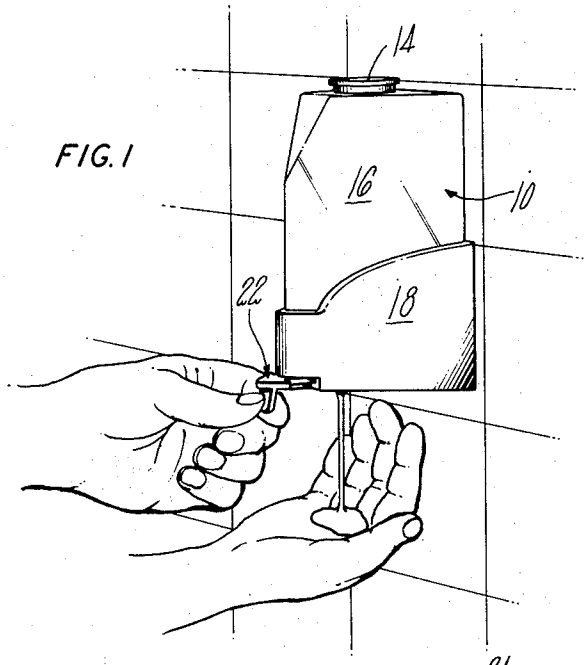


FIG. 1



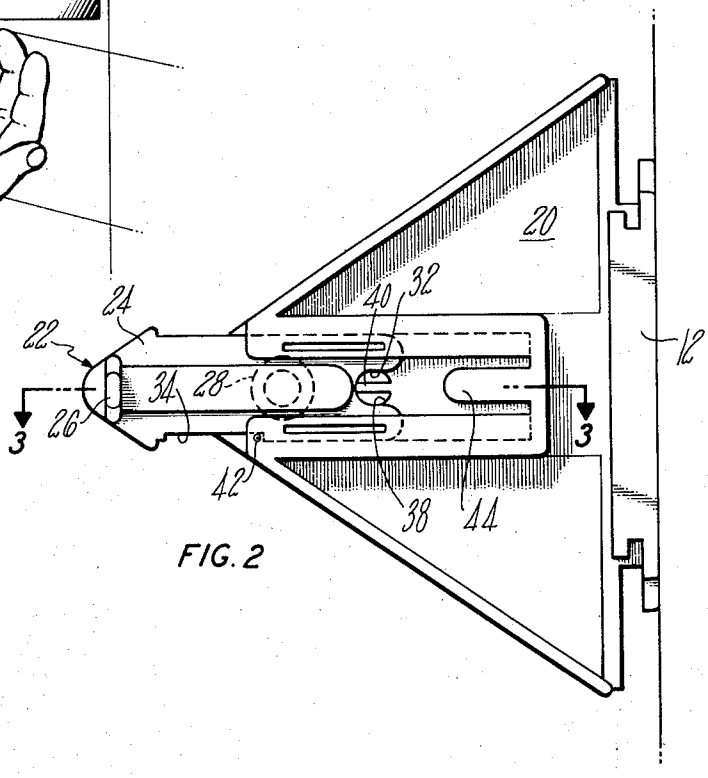


FIG. 2

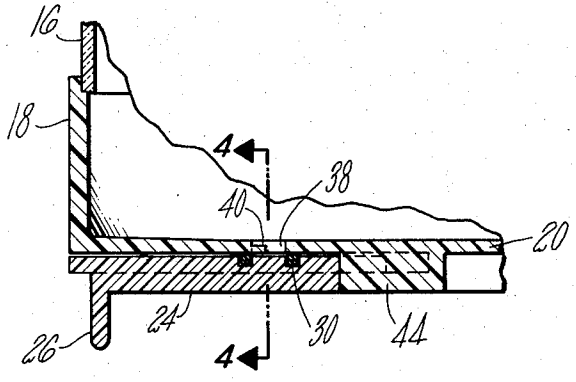


FIG. 3

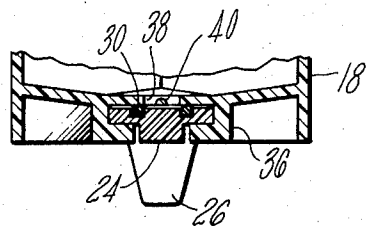


FIG. 4

DISPENSER AND SLIDE VALVE FOR USE THEREIN

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to the dispensing of liquids. More specifically, this invention is directed to a slide valve mechanism for use in the dispensing of liquids. Accordingly, the general objects of the present invention are to provide novel and improved methods and apparatus of such character.

2. Description of the Prior Art

While not limited thereto in its utility, the present invention has been found to be particularly well suited for use in the dispensing of soap solutions and particularly liquid shampoos. There are, of course, numerous dispensers available in the prior art wherein an operator can release from a storage container a quantity of liquid by means of operating a plunger connected to a valve. Some of these prior art devices have found utility in the dispensing of soap solutions. The solutions employed in these prior art dispensers have been comparatively thin and the dispensers have been plagued with both leakage problems and dripping when the flow control valve was closed.

Many shampoos are presently sold in glass bottles and there is a definite trend to increased packaging in glass since this material can be recycled. The use of a glass shampoo bottle in a tub or shower enclosure presents an obvious safety hazard. Accordingly, a desire has developed for a dispenser which could receive the contents of a glass shampoo bottle and thereafter release the shampoo in controllable quantities; such a device typically being intended for affixation to a wall of a bath or shower enclosure. When compared to soap solutions, shampoos are very viscous and the dispensing of such viscous materials presents peculiar problems in addition to those which, as briefly discussed above, have plagued prior art dispensers. Foremost these additional problems is the fact that most liquid shampoos tend to coagulate relatively quickly and thus, if employed in a conventional prior art soap solution dispenser, would dry on surfaces thereby aggravating the leakage problem and/or causing binding of the moving member of the valve.

SUMMARY OF THE INVENTION

The present invention overcomes the above briefly discussed and other deficiencies and disadvantages of the prior art by providing a novel and improved device particularly well suited for the dispensing of viscous materials such as liquid shampoos. Apparatus in accordance with the present invention includes a reservoir defining portion and, cooperating with the base thereof, a unique slide valve mechanism. The slide valve mechanism includes a slide member having an O-ring mounted thereon. This slide member cooperates with a dispensing aperture in the base of the reservoir in such a manner that the O-ring is coaxial with the dispensing aperture with the valve mechanism in the closed position. The slide mechanism is also provided with a shaped slot which is aligned with the aperture in the base of the reservoir in the dispensing position; the slide slot being shaped so as to cut off flow from the reservoir without any dripping when the valve is moved from the open to the closed position. In order to prevent any distortion of or damage to the O-ring as the slide is moved, the dispensing aperture in the base of the reservoir is divided into two sections by a bar which is aligned with the direction of movement of the slide; the O-ring riding across the dispensing aperture on the bar. The invention also includes a locking mechanism which prevents complete withdrawal of the slide from the base of the reservoir.

BRIEF DESCRIPTION OF THE DRAWING

The present invention may be better understood and its numerous objects and advantages will become apparent to those skilled in the art by reference to the accompanying drawing wherein like reference numerals refer to like elements in the several figures and in which:

FIG. **1** is a perspective view of a dispenser device in accordance with the present invention;

FIG. **2** is a bottom plan view showing the slide valve of the dispensing mechanism of FIG. **1**;

FIG. **3** is a cross-sectional side elevation view, taken along line **3—3** of FIG. **2**, showing additional details of a slide valve in accordance with the present invention; and

FIG. **4** is a cross-sectional rear elevation view, taken along line **4—4** of FIG. **3**, of a slide valve in accordance with the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In accordance with a preferred embodiment of the invention a dispenser includes a container or reservoir indicated generally at **10.** Container **10** is mounted to a wall by means of a mounting plate, such as plate **12** of FIG. **2,** and is removable therefrom. Container **10** may be filled with a liquid to be dispensed, for example a shampoo, by means of an opening in the top thereof which is provided with a removable cap **14.** In the disclosed embodiment the container **10** is formed of two integral portions **16** and **18** and the base **20** of portion **18** cooperates, in the manner to be described below, with a slide valve mechanism indicated generally at **22** in FIG. **1** to perform a valving function for release of quantities of liquid from container **10.**

Referring jointly to FIGS. **2–4,** the slide valve mechanism **22** includes a generally T-shaped slide member **24.** A grip portion **26** projects downwardly from the forward end of slide member **24** and serves, as may be seen from FIG. **1,** as the means by which the slide may be reciprocated with respect to base **20** of container **10.** The slide member **24** is provided, in its upper surface, with a circular recess **28.** An O-ring seal **30** is positioned in recess **28;** the thickness of the O-ring being slightly in excess of the depth of the recess **28.** The slide member **24** is, as may be seen from FIG. **2,** provided with a cutout **32** at the end disposed opposite to the grip portion **26.** The cutout **32** is shaped, at its inwardly disposed end, so as to insure flow shut-off without any excess or dripping. The slide member **24** is also provided with a cutout or groove **34** which extends partly along one longitudinal side of the slide member. Groove **34** serves, in the manner to be described below, to at least partly limit the degree of movement of the slide member **24.**

The base **20** of container **10,** as may best be seen from FIG. **4** includes an integral downwardly projecting portion **36** which defines a track in which the slide member **24** moves. The outwardly extending arms of

generally T-shaped slide member 24 are supported for movement on oppositely disposed shoulders of recessed grooves in either side of the projection 36. Thus, considering FIG. 4, the projection 36 comprises a pair of oppositely facing L-shaped flanges which define, therebetween, a groove which communicates with the base 20 of container 10. The base 20 of the container is, in the vicinity of this groove, provided with a dispensing aperture 38. With the slide valve in the open or dispensing position, as shown in FIG. 2, dispensing aperture 38 is in registration with cutout 32 in slide 24. With the valve in the closed position, as depicted in FIG. 3, aperture 38 is coaxial with and surrounded by the O-ring seal 30 carried by slide 24.

Aperture 38 in the base 20 of container 10 is bridged by a bar 40. The bar 40 extends along a diameter of aperture 38 which is aligned with the direction of motion of slide member 24. Incorporation of bar 40 in the slide valve insures that the O-ring 30 will not be subject to wear or distortion by engagement with the edge of aperture 38 during reciprocation.

The slide valve assembly also includes a spring pin 42. The spring pin engages, at its lower smaller diameter end, an aperture provided therefore in the L-shaped flange of projection 36 which is on the same side of slide 24 as the groove 34. The pin 42 cooperates with the shoulders which define the opposite ends of groove 34 to limit the degree of motion of slide member 24.

In assemblying the dispensing mechanism, the O-ring 30 is placed in recess 28 in slide member 24. Thereafter, the slide is inserted in the base with the arms of the T-shaped member 24 supported by the recessed grooves in projection 36. Thereafter the pin 42 will be inserted from the top of the aperture provided therefore in the base member. The dispenser is now ready for use.

In use, the slide 24 is manually reciprocated by means of grip 26. When pulled to the opened position of FIG. 2 liquid will be dispensed as shown in FIG. 1. When it is desired to terminate the dispensing action slide 24 will be pushed inwardly to the closed position shown in FIG. 3. As the slide moves to the closed position the shaped cutout 32 will serve to pinch off flow through aperture 38 and thus flow will be terminated without any dripping. The O-ring 30 will be lubricated by the liquid in container 10. Although not necessarily for operation, since the function can be accomplished by means of cooperation between pin 42 and the shoulders which define groove 34, the projection 36 may also be provided with an extension 44 which is aligned with and has an end commensurate in shape with the shape of the cutout 32 at the inwardly disposed end of slide member 24. With the slide fully inserted, so as to establish a seated relationship of extension 44 in cutout 32, correct positioning of O-ring 30 with respect to aperture 38 will be insured.

While a preferred embodiment has been shown and described, various modifications and substitutions may be made thereto without departing from the spirit and scope of the invention. Accordingly, it is to be understood that this invention has been described by way of illustration and not limitation.

What is claimed is:

1. A slide valve comprising:

means defining a dispensing aperture;

bar means bridging said aperture;

a valve member cooperating with said aperture to perform a valving action, said valve member being provided with an annular recess in a first planar surface thereof which faces said aperture defining means, said recess having an inner diameter in excess of the diameter of said dispensing aperture, said valve member further having at least a first integral stop thereon;

an O-ring seal positioned in said valve member recess, said O-ring seal being coaxial with said dispensing aperture with the valve in the closed position;

means for supporting said valve member for relative movement with respect to said aperture in a direction generally aligned with said bar means; and

pin means mounted on said aperture defining means, said pin means cooperating with said valve member first integral stop to limit the motion of said valve member in the valve opening direction, contact between said pin means and said first integral stop being commensurate with at least a portion of a first end of said valve member being withdrawn from registration with said dispensing aperture.

2. The apparatus of claim 1 wherein said valve member comprises:

an elongated slide, said slide having at said first end thereof a cutout which cooperates with said dispensing aperture to terminate flow through said valve.

3. The apparatus of claim 2 wherein said elongated slide further comprises:

a recess in a first edge thereof, said first edge being generally transverse to said first planar surface and said recess being defined by spaced shoulders, at least a first of said shoulders comprising said first integral stop.

4. The apparatus of claim 3 wherein said pin means comprises:

a spring pin mounted on said supporting means, said spring pin extending transversely to the direction of motion of said slide and being located in the region of said recess in said first edge of said slide.

5. The apparatus of claim 4 wherein said supporting means comprises:

a downwardly extending projection of said aperture defining means, said projection defining a pair of parallel oppositely facing recessed grooves.

6. The apparatus of claim 5 wherein said slide is generally T-shaped in cross-section.

7. The apparatus of claim 6 wherein said cutout in said first end of said slide terminates in an arcuate portion having a radius equal to the radius of said dispensing aperture.

8. The apparatus of claim 7 wherein said dispensing aperture defining means comprises:

a reservoir for a fluid to be dispensed, said reservoir having a base, a circular hole in said base forming the dispensing aperture.

9. The apparatus of claim 8 wherein said bar means comprises:

a portion of the base of said reservoir defining means which defines a diameter of said dispensing aperture.

10. The apparatus of claim 2 wherein said cutout in said first end of said slide terminates in an arcuate portion having a radius equal to the radius of said dispensing aperture.

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