Jan. 2, 1968 C. JACUZZI 3,361,303

LIQUID AND PASTE DISPENSER

Filed Sept. 17, 1965

Fig. 1.

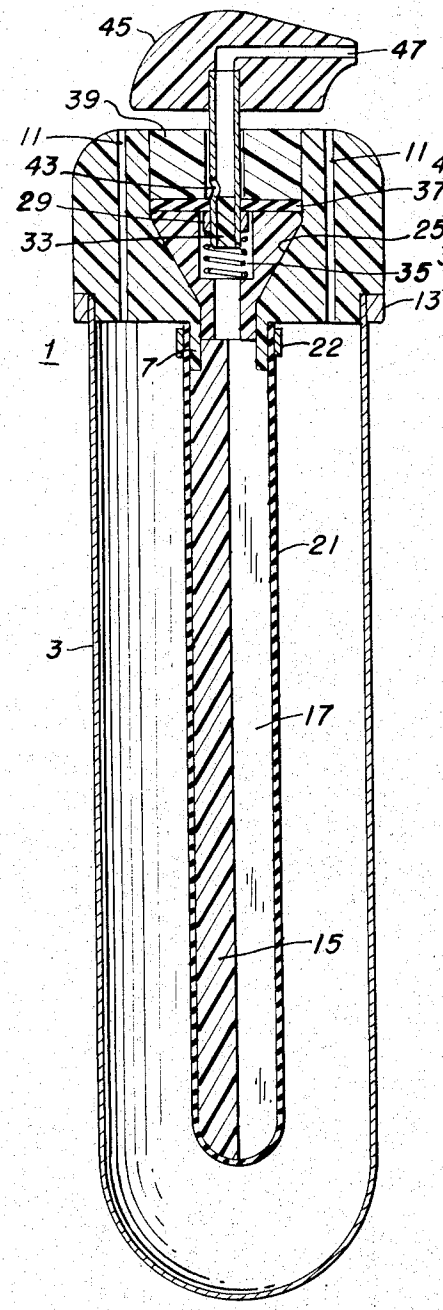


Fig. 2.

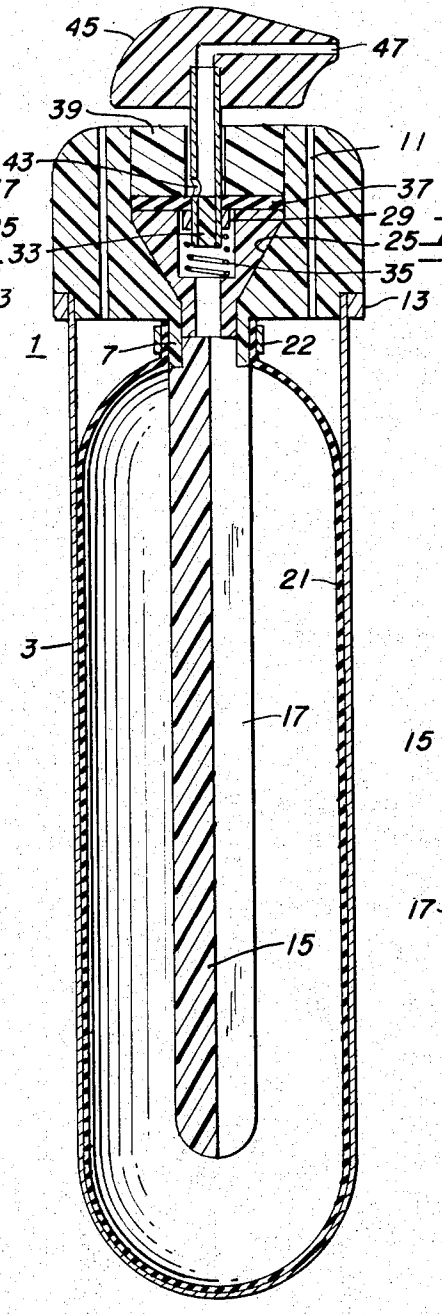
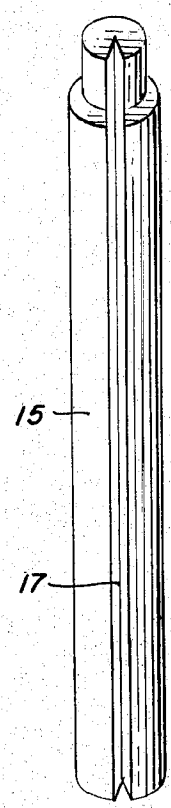


Fig. 3.



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LIQUID AND PASTE DISPENSER

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ABSTRACT OF THE DISCLOSURE

A liquid and paste dispenser of the aerosol type wherein the container is vented to the atmosphere and the contents are confined to an expansible tube which encloses a stem having a passage to a control valve, the expansible tube being preferably prestressed to snugly fit the stem in the absence of any dispensible contents in such tube.

My invention relates to liquid and paste dispensers, and more particularly to a dispenser which functions by reason of self-contained pressure.

In the general category to which the present invention relates are the aerosol dispensers. While they function by reason of a self-contained source of pressure, such source involves gas under such high pressure that not only are the bottoms of the dispensing cans made concave to withstand such pressures, but the instructions on each dispenser warn against explosion should the same be exposed to high temperatures or other abuses. Also, such dispensers are limited as to orientation in dispensing.

Among the objects of my invention are:

(1) To provide a novel and improved dispensing means for liquids and pastes;

(2) To provide a novel and improved dispensing means for liquid and pastes which will function by reason of self-contained pressure, but will not present the hazards of explosion;

(3) To provide a novel and improved liquid and paste dispenser of the aerosol type but one which is free of the hazards encountered in the use of such dispensers;

(4) To provide a novel and improved liquid and paste dispenser of simple construction, and one which is capable of dispensing the entire contents thereof under pressure.

(5) To provide a novel and improved liquid and paste dispenser which can dispense without regard to its position or orientation.

Additional objects of my invention will be brought out in the following description of a preferred embodiment of the same, taken in conjunction with the accompanying drawings wherein

FIGURE 1 is a view in section through a dispenser embodying the present invention, depicted in its condition prior to filling;

FIGURE 2 is a corresponding view depicting the dispenser when filled; and

FIGURE 3 is a three dimensional view of a liquid displacement rod or stem constituting an important component of the dispenser as illustrated in FIGURES 1 and 2.

Referring to the drawings for details, the specific embodiment illustrated comprises a closed receptacle **1** including a container **3** and a cover **5** therefor. The container is closed at its lower end and is preferably formed of one piece with the closed end or bottom hemispherical.

The cover may be of a plug type, and provided with a hollow depending neck **7** centrally thereof and forming a continuation of a passageway **9** through the cover. One or more vent passageways **11** through the cover place the interior of the container in permanent communication with the external atmosphere.

Encircling the upper end of the container is a retaining ring **13** serving to maintain the container at its rim, in snug fitting engagement with the plug type cover **5**.

Affixed at one end within the neck, is a rod or stem **15**, having a longitudinal channel or groove **17** extending preferably the full length thereof and terminating at its upper end in communication with the passageway through the cover.

Installed over the stem, is an expansible tube **21**, closed at its lower end, and sealed at its otherwise open end about the neck, by any suitable hose type clamp **22**. This expansible tube is preferably of less diameter than the stem and is installed in partially stressed condition, so as to snugly hug the stem under pressure.

In the passageway through the cover, there is installed a manually operable normally closed valve means of any suitable character, capable on opening of the valve, to complete a flow passageway from the interior of the expansible tube through the stem and cover to external atmosphere. One form of valve means suitable for purpose might be that employed in conventional aerosol dispensers, and such type of valve is illustrated in the drawings.

Briefly, the valve means comprises an inner component **25** having a counterbored passageway **25** therethrough in communication with the channel or groove **17** in the stem, the counterbore to house a spring biased valve in the form of a collar **29** mounted on the end of a hollow valve stem or tube **31** extending upwardly beyond the exposed end of the cap, the proximate end of the tube being closed by a plug **33**. The valve, under pressure of a spring **35**, is adapted to seat against a disc **37** retained in contact with the inner component **25** of the valve means, by a valve retaining ring **39** set into the cover and having a central passageway of sufficient diameter to permit free movement of the valve tube.

The valve is adapted to be depressed by pressure on the exposed end of the tube, and by providing a small opening **43** in the tube above but in proximity to the valve seat disc **37**, the interior of the expansible tube **21** may be brought into flow communication with the atmosphere by depressing the valve sufficiently to bring the perforation below the valve seat. A decorative spray cap **45** mounted on the exposed end of the tube and having a passageway **47** therethrough connecting with the tube, permits of the application of finger pressure to the tube to provide for such opening of the valve.

Should a fine spray discharge or aerated foam be desired, an aspirator may be incorporated in the cap, in the form of a venturi in the passageway **47** and a vent connecting therewith. By covering the vent, a liquid or paste discharge may be re-established.

In preparing the dispenser for use, the contents will be introduced under pressure through the tube **31** prior to the installation of the spray cap, which filling may be accomplished by holding the tube depressed during such filling operation. The introduction of such contents under pressure, will cause the expansible tube to expand as it is being filled, until the same contacts the container, at which time the filling mechanism will be withdrawn, whereupon the valve will automatically close to retain the contents under pressure. Upon application of the spray cap, the contents of the dispenser may be dispensed at will and in desired quantity, merely by depressing the same as one would the cap on an aerosol dispenser.

In this connection, it is important to note that the contents of the dispenser of the present invention has no expansible characteristics, and therefore has no inherent property to exhibit any pressure on its own. The only element stressed and to which pressure may be attributed, is the expansible tube **21**, unless perchance, the tube is over-filled to the point where the contents brings pressure

to bear against the container itself, it being noted that any air in the container is automatically expelled through the air vents during filling, and consequently no gas under pressure will exist at any time within the container.

Accordingly, pressure against the contents of the expansible tube can be attributed solely to the tube itself, unless the dispenser happens to be over-filled, in which case some pressure may be attributable to the container itself, while under stress. In either event however, all pressures are directed inwardly and consequently, risks of explosion are non-existent.

While the expansible tube **21** might be installed loosely instead of under stress as previously described, it is to be noted that by installing it under stress, complete evacuation of the contents thereof may be realized, for the expansible tube will continue to exert pressure against its contents until the tube actually pressure engages the stem, by which time the entire contents of the tube will have been dispensed.

From the foregoing description of my invention in its preferred form, it will be apparent that the same is subject to alteration and modification without departing from the underlying principles involved, and I accordingly, do not desire to be limited in my protection to the specific details illustrated and described, except as may be necessitated by the appended claims.

I claim:

1. A liquid and paste dispenser comprising a closed receptacle including a container and cover therefor, and having an air vent,

a stem of substantially uniform cross section extending into said receptacle from said cover end,

an expansible tube, closed at its bottom end and enclosing said stem and sealed about said stem at its otherwise open end, said stem extending downwardly substantially to the bottom of said tube,

said expansible tube, in its unstressed condition, having an internal periphery less than the outside periphery of said stem, whereby in its empty condition, said tube will, while still in stressed condition, engage said stem to assure substantially complete dispensing of its dispensible contents outwardly from the periphery of said stem, said tube being expandable to substantially the capacity of said receptacle when filled with dispensible contents,

a flow passageway from the interior of said tube through said stem and cover to external atmosphere, and

manually operable normally closed valve means in said cover, blocking said passageway.

2. A dispenser according to claim **1** wherein said stem is provided with a longitudinal slot in its outer periphery extending substantially the entire length thereof.

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