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PRESSURIZED DISPENSING DEVICE

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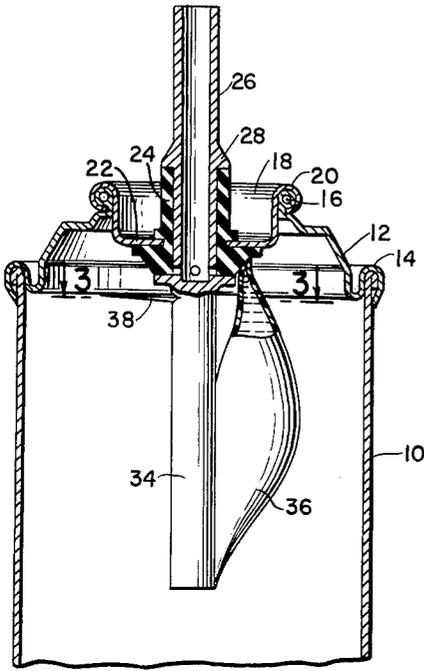


FIG. 1.

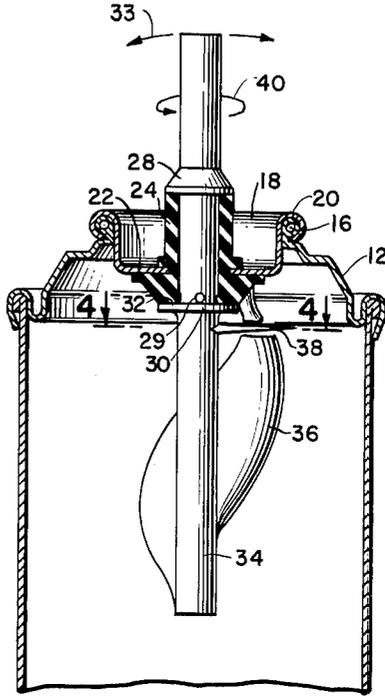


FIG. 2.

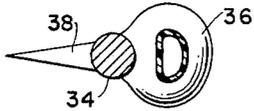


FIG. 3.

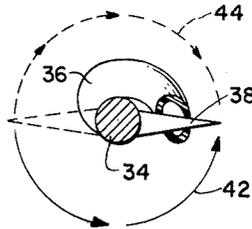


FIG. 4.

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PRESSURIZED DISPENSING DEVICE

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The present invention relates to a compartmentalized pressurized dispensing device for keeping two or more materials separated from each other until time of use. More particularly, this invention relates to a pressurized container in which two or more materials are kept separated from each other, and are combined before dispensing from the pressurized device.

It will be appreciated that there are various compositions which cannot be marketed in premixed form. Such compositions as dental impression formulas, polyurethanes, rubberized silicones, epoxies, polystyrene foams, and certain other two or more component systems cannot be mixed until use because the mixing causes an immediate chemical reaction, making the pressurized container inoperative. Materials of this type require a special packaging and dispensing device in order to maintain the portions distinct during shipment and in storage prior to sale, and yet allow the portions to be brought together in a convenient manner when their use is desired.

The present invention is directed broadly to the dispensing of all types of compositions of the above-mentioned character and it has found further utility for foods, insecticides, lacquers, paint compositions, and the like, which, to be effective as usable products, must be mixed in situ when use is desired. It is essential in the commercialization of such products that the reactive ingredients be held in a state of inactivity for an indefinite period of time to account for shipping and storage periods, to provide an effective product when needed.

The dispensing device of this invention meets these needs by providing partition means which divide the container into two or more separate compartments. Cutting means operatively connected to the discharge nozzle of the dispensing device are effective to cut a plastic wall portion separating the compartments so that the ingredients may be mixed prior to dispelling for the intended use.

One of the primary objects of the present invention is to provide a compartmentalized dispensing device suited for packaging compositions, the ingredients of which should be kept separate until use.

Another object of the present invention is to provide a compartmentalized dispensing device in which means facilitating the mixing of the separated ingredients are operatively connected to the discharge nozzle assembly of the dispensing device.

A further object of the present invention is to provide a compartmentalized dispensing device which can be produced efficiently and economically.

The above and other objects, features, and advantages of the invention will become more apparent from an examination of the drawings, specification, and appended claims.

In the drawings:

FIGURE 1 is an elevational cross-sectional view of one embodiment of a compartmentalized dispensing device of the present invention;

FIGURE 2 is a view similar to FIGURE 1 but showing the cutting means in the process of cutting the container partition means;

FIGURE 3 is a horizontal cross-sectional view taken along the line 3-3 of FIGURE 1; and

FIGURE 4 is a horizontal cross-sectional view taken along the line 4-4 of FIGURE 2.

Referring now to the drawings, FIGURE 1 illustrates the upper portion of a typical compartmentalized dispensing device of the present invention in which a container 10 has a cup-shaped cover 12 fitting into the upper open end of container 10 and clinched by a rolling flange 14 to provide an hermetic seal between cover 12 and container 10. The top of cover 12 defines a central aperture which is bounded by a rolled flange or bead 16. An annular insert 18 fits within the aperture and is provided with a rolled flange 20 which embraces the bead 16 to form an hermetic seal at this point. Insert 18 has an annular bottom 22 adapted to be received and retained within a groove in an annular gasket 24.

Rotatably positioned in annular gasket 24 is a discharge nozzle 26 which has a flared flange 28 providing an abutment for the upper end of gasket 24. At the lower end of discharge nozzle 26 there is formed a valve unit consisting of a plurality of apertures 29 which provide access to the interior of the discharge nozzle, and a valve stem 30 which in its normal position is in sealing engagement with a valve seat 32 formed by the bottom end of gasket 24. It will be appreciated that a lateral force applied to deflect the upper end of discharge nozzle 26 in directions as shown by arrows 33 in FIGURE 2 is effective to unseat valve stem 30 and to establish a flow path from the interior of container 10 through apertures 29 into discharge nozzle 26. Integral with valve stem 30 is a downwardly depending rod 34.

A sealed plastic sac 36 is positioned within container 10 with its upper end fastened to gasket 24 by an adhesive or other suitable securing means and with its lower end fastened adjacent the free end of rod 34 by an adhesive or other suitable securing means. Sac 36 may be constructed of any plastic material which is impervious to the ingredients stored in the container. It has been found that the sac may be made of a "Mylar" film, a highly durable, transparent, water-repellent film of polyethylene terephthalate resin characterized by outstanding strength and chemical inertness. Many other materials may be used to form the sac, e.g., polyethylene, nylon, and the like. The thickness of the sac will depend, of course, upon the condition under which the pressurized container is to operate.

A suitable puncturing device or cutter 38 is mounted on rod 34 at the underside of valve stem 30. Upon manual rotation of discharge nozzle 26 in the direction shown by arrow 40 of FIGURE 2, cutter 38 is rotated in the direction shown by solid arrows 42 of FIGURE 4 to cut or otherwise rupture sac 36 so that the ingredients within the container may be mixed just prior to utilization. If discharge nozzle 26 is rotated in the opposite direction, cutter 38 will take the path shown by dashed arrows 44 of FIGURE 4. It will be appreciated that prior to rupturing sac 36, cutter 38 is maintained in an inoperative position away from sac 36. The frictional engagement of the discharge nozzle within annular gasket 24 inhibits inadvertent contact between cutter 38 and sac 36.

Sac 36 may optionally be secured in any other suitable manner so as to be in position to be ruptured by cutter 38. For example, the upper end of the sac might be secured to annular insert 18. It is also within the scope of the invention to fasten only one end of sac 36. In the event that more than two ingredients are to be combined, a plurality of sacs 36 may be provided.

When not in use, discharge nozzle 26 may be covered by a suitable cap (not shown).

In operation, container 10 is partially filled with one of the ingredients to be discharged. In the case of a two-component system, the other ingredient is placed within sac 36 which is fastened in position by suitable securing means to a sub-assembly consisting of insert 18, gasket 24, discharge nozzle 26 and the associated structure. This

sub-assembly may now be hermetically sealed to cover 12 which is then in turn hermetically sealed to container 10. The assembled container may be pressurized in known manner with a propellant such as one or more of the Freons, nitrogen, argon, or other suitable inert gas. The container in this condition may be stored until use is desired, whereby unscrewing of the cap, and manual rotation of discharge nozzle 26 causes cutter 38 to rupture sac 36 readying the container for use. Pressing the discharge nozzle laterally unseats valve stem 30, thereby discharging material from the container as desired.

Although the present invention has been described with particularity with reference to preferred embodiments, it will be appreciated, after understanding the invention, that various changes and modifications may be made therein without departing from the scope and spirit of the invention. Accordingly, it is intended to encompass all such changes and modifications as fall within the scope of the appended claims.

What is claimed is:

1. A pressurized dispensing device for maintaining ingredients separated until use is desired, comprising a container having an opening in one end thereof, a valve device for dispensing the contents of the container rotatably mounted within said opening, said valve device including a valve seat and a valve stem contoured to operatively engage said seat, partition means dividing said container into at least two compartments, and cutter means operatively connected to said valve device for rotation therewith to rupture said partition means to effect mixing of the contents of said compartments.

2. A dispensing device for maintaining ingredients separated until use is desired, comprising a container having an opening in one end thereof, a valve device for dispensing the contents of the container including a discharge nozzle rotatably mounted within said opening, partition means dividing said container into at least two compartments, and means actuatable by rotation of said discharge nozzle to effect mixing of the contents of said compartments within said container.

3. A pressurized dispensing device for maintaining ingredients separated until use is desired, comprising a container having a centrally disposed opening in the top thereof, a valve device for dispensing the contents of the container rotatably mounted within said opening, said valve device including an annular valve seat and a valve stem contoured to operatively engage said seat, a sealed sac located in said container adjacent the top thereof, and cutter means operatively connected to said valve device for rotation therewith to rupture said sac to effect mixing of the contents of said container with the contents of said sac.

4. A pressurized dispensing device for maintaining ingredients separated until use is desired, comprising a container provided with an opening in one end thereof, an annular gasket secured within said opening, the lower end of said annular gasket constituting an annular valve seat, a valve device for dispensing the contents of the container including a discharge nozzle portion frictionally retained within said annular gasket and adapted to be rotated therein, an annular valve stem positioned to normally engage said valve seat in sealed engagement therewith, said discharge nozzle portion above and adjacent to said annular valve stem being provided with at least one aperture therein, at least one sealed sac located within said container, and cutter means operatively connected for rotation with said discharge nozzle portion to rupture each sac whereby the contents thereof are mixed with the contents of said container.

5. A pressurized dispensing device for maintaining ingredients separated until use is desired, comprising a container provided with a centrally disposed opening in the

top thereof, a resilient annular gasket secured within said opening, a valve device for dispensing the contents of the container including a discharge nozzle portion frictionally retained within said annular gasket and adapted to be rotated therein, a valve seat, and a valve stem positioned to normally engage said valve seat in sealed engagement therewith, said discharge nozzle portion above and adjacent to said valve stem being provided with at least one aperture therein, a rod secured to said valve stem and having a free end depending downwardly therefrom, a sealed sac located within said container, means to secure the upper end of said sac adjacent to said annular gasket, means to secure the lower end of said sac to said rod adjacent its free end, and cutter means operatively connected to said discharge nozzle portion for rotation therewith to rupture said sac whereby the contents thereof are mixed with the contents of said container.

6. A pressurized dispensing device for maintaining ingredients separated until use is desired, comprising a container provided with a centrally disposed opening in the top thereof, a resilient annular gasket secured within said opening, the lower end of said annular gasket constituting an annular valve seat, a valve device for dispensing the contents of the container including a discharge nozzle portion frictionally retained within said annular gasket and adapted to be rotated therein, an annular valve stem connected to said discharge nozzle portion and adapted to normally engage said valve seat in sealed engagement therewith, said discharge nozzle portion above and adjacent to said annular valve stem being provided with at least one aperture therein, a rod member secured to said valve stem and depending downwardly therefrom, a sealed sac located within said container, means to secure the upper end of said sac adjacent the top of said container, means to secure the lower end of said sac to said rod member, and cutter means operatively connected to said valve stem for rotation with said discharge nozzle portion to rupture said sac whereby the contents thereof are mixed with the contents of said container.

7. A dispensing device according to claim 2 wherein the partition means provide two nested compartments in said container, one of the nested compartments being disposed within the other.

8. A dispensing device for maintaining ingredients separated until use is desired, comprising a container having an opening in one end thereof, an annular gasket secured within said opening, the lower end of said annular gasket constituting an annular valve seat, a valve device for dispensing the contents of the container including a discharge nozzle portion movably retained within said annular gasket and including an annular valve stem positioned to normally engage said valve seat in sealed engagement therewith, partition means dividing said container into at least two compartments, and means actuatable by movement of said discharge nozzle portion to effect mixing of the contents of said compartments within said container.

References Cited by the Examiner

UNITED STATES PATENTS

1,535,529	4/1925	Hopkins	222—485 X
1,721,137	7/1929	Schmidt	222—145 X
2,844,284	7/1958	Ackermann	222—136 X
2,889,078	6/1959	Thomas	222—80
3,080,094	3/1963	Modderno	222—82

FOREIGN PATENTS

729,709	12/1942	Germany.
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