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3,318,484

COMPARTMENTED PRESSURIZED DISPENSING DEVICE

Filed May 17, 1965

2 Sheets-Sheet 1

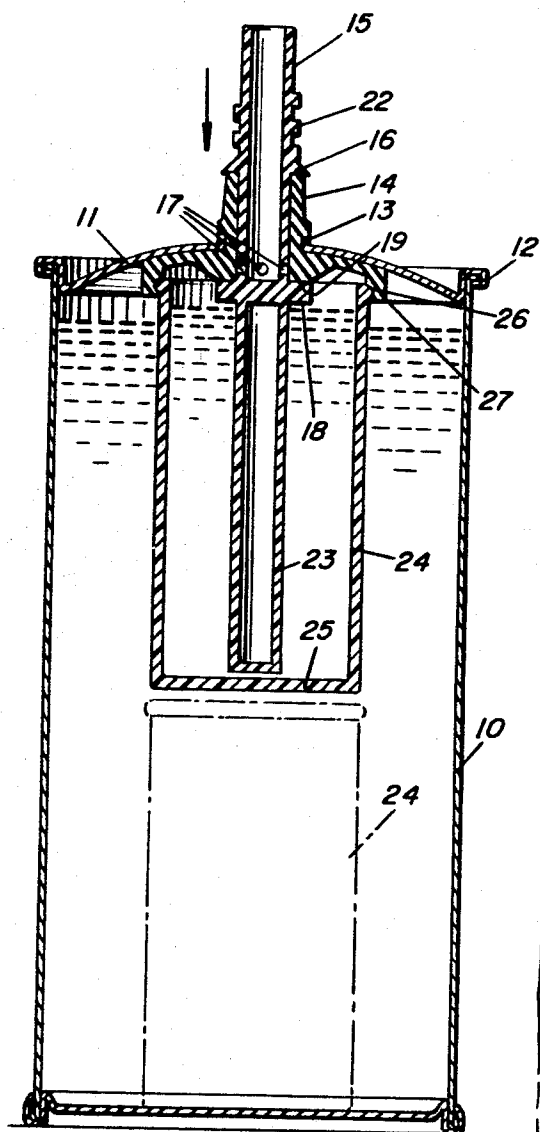


Fig. 1

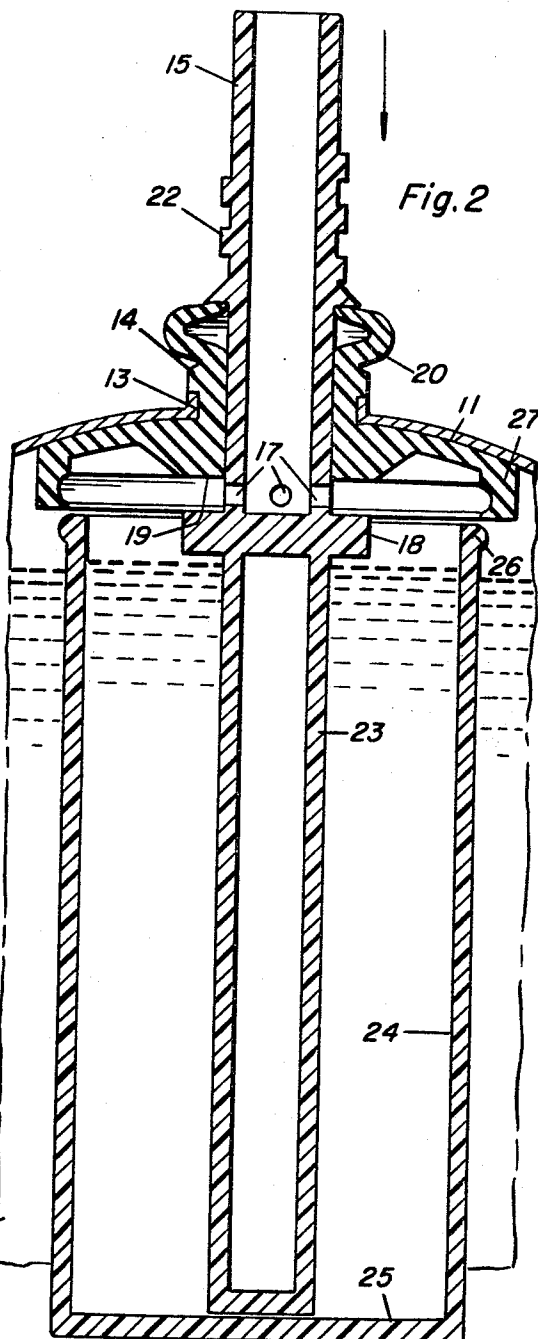


Fig. 2

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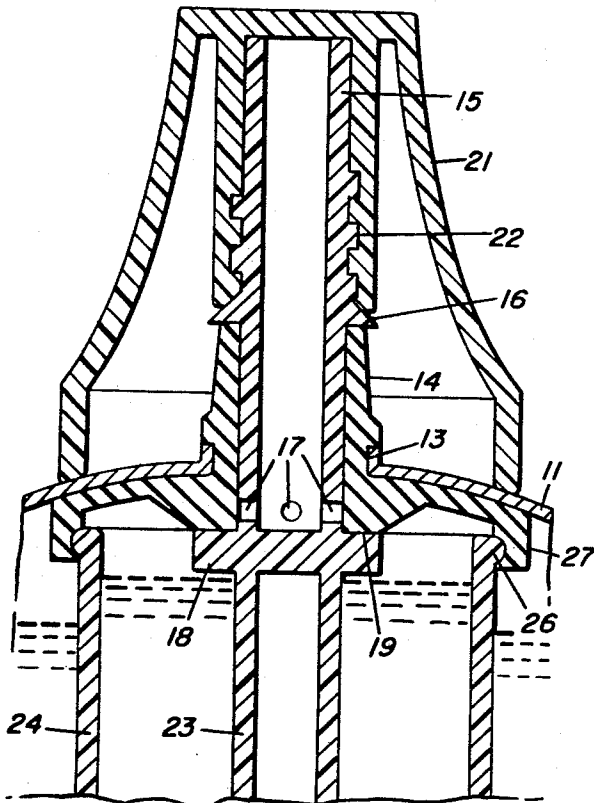
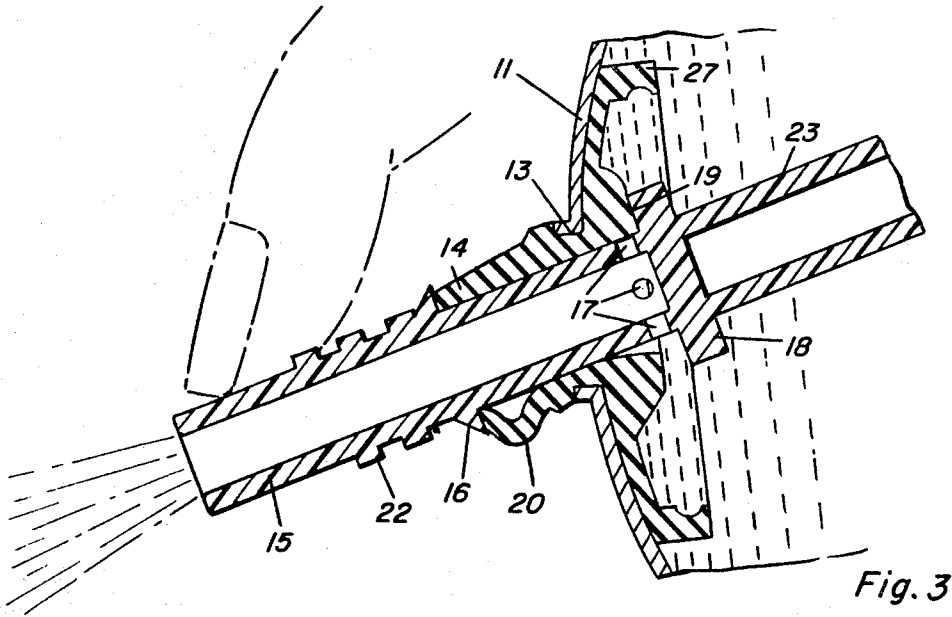
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COMPARTMENTED PRESSURIZED DISPENSING DEVICE

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4 Claims. (Cl. 222-136)

The present invention relates to a compartmented dispensing device designed for separately storing two or more ingredients of a multi-component system, and to the method of producing such dispensing device in assembled form with the stored components therein. More particularly, this invention relates to a dispensing device in which two or more materials are separately stored in nested containers, and are combined shortly before being dispensed from the device. This invention relates to another specific embodiment of the invention disclosed in U.S. patent application Ser. No. 431,420, filed Feb. 9, 1965, now Patent No. 3,255,926, dated June 6, 1966.

It will be appreciated that there are various compositions which cannot be marketed in pre-mixed form. Such compositions are hair dyes, dental impression formulas, polyurethanes, rubberized silicones, epoxies, polystyrene foam, foods, insecticides, lacquers, paint compositions, and many other multi-component systems of the type wherein reactions take place upon mixing of the components of the respective system. Such components may be advantageously packaged in the compartmented dispensing devices of the type exemplified by the present species. Compositions of the above type require special packaging in order to maintain the components of the respective systems separated during shipment and in storage, and yet allow the components to be brought together in a convenient manner when their use is desired.

The present invention is comprised broadly of containers for the dispensing of all types of compositions of the above mentioned general character which must be mixed in situ at the time of use. In the commercialization of such products the reactive components are held in states of inactivity for an indefinite period of time to account for shipping and storage periods, and to permit the formation of an effective product when needed.

In certain systems which require refrigeration of the product when the components thereof are admixed, the components may be stored separately in the containers without refrigeration prior to admixture.

The dispensing device of the present invention meets these needs by providing an outer container for the storage of one component, and an inner container containing another component positioned within said outer container. The inner container has a closure which may be opened as will be described more fully hereinafter to enable the components to be mixed prior to dispensing the composition for its intended use.

One of the primary objects of the present invention is to provide a compartmented dispensing device having inner and outer containers for storing separated components in which means facilitating the mixing of the separated components are operatively connected to the discharge nozzle assembly of the dispensing device.

A further object of this invention is to provide a compartmented pressurized dispensing device which can be produced and assembled for use efficiently and economically.

The above and other objects, features and advantages of the present invention will become more apparent from the examination of the drawings, the following detailed description, and the appended claims.

In the drawings wherein like reference numerals designate like parts in the several views:

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FIGURE 1 is an elevational cross-sectional view of one embodiment of a compartmented pressurized dispensing device made in accordance with the present invention and the prior teachings of co-pending application Ser. No. 431,420 as aforesaid, with the inner container being shown in full lines in its assembled position and in dotted lines in its recessed position for permitting admixture of the components;

FIGURE 2 is a fragmentary sectional view showing the dispensing device with the inner container being separated from its closure by the depressing of the valve so as to permit the inner container to drop and the components to mix;

FIGURE 3 is a detailed view of the form of valve which may be used to dislodge the inner container and yet control the discharge of the product from the outer container as by angularly moving the valve means by the fingers; and

FIGURE 4 is a fragmentary sectional view showing the valve means and container in normal storage position and with a safety cap affixed to the spout portion of the valve.

Referring now to the drawings in detail, a dispensing device of the present invention is illustrated as having an outer container 10. The upper open end of container 10 has a cup-shaped cover 11 clenched thereto by double-seamed flange 12 to provide an hermetic seal between cover 11 and container 10. Cup-shaped cover 11 has a rimmed aperture 13 which receives and retains therein a grooved elongated annular gasket 14.

Rotatably positioned in gasket 14 is a discharge nozzle 15 which has a flared flange 16 providing an abutment for the upper end of gasket 14. At the lower end of discharge nozzle 15 there is formed a valve unit consisting of a plurality of apertures 17 which provide access to the interior of the discharge nozzle, and a valve flange 18 which in its normal position is in sealing engagement with a valve seat 19 formed at the bottom of gasket 14. Due to the resiliency of gasket 14 which may be formed of rubber, polyethylene or other suitable flexing material, a downward lateral force applied to depress the upper end of discharge nozzle 15 and to distort the wall of gasket 14 as at 20 is effective to unseat valve flange 18 and move apertures 17 into a lower position to establish a flow path from the interior of container 10 through apertures 17 into discharge nozzle 15. To avoid inadvertent deflection of discharge nozzle 15, it may be covered by a suitable cap 21. To this end, the discharge nozzle may be provided with exterior threads 22 so that the cap may be threaded thereon. A depressing lever 23 which is preferably molded in a unit with discharge nozzle 15 and valve flange 18 extends downwardly within a normally fixed inner container 24 and is adapted to forcibly engage the bottom 25 thereof to displace container 24.

Inner container 24 is preferably positioned axially within outer container 10. In the present illustration, the inner container may be of any desired cross section with a wide mouth and it may be a bottle made of glass or a suitable plastic. The inner container has an upper neck 26 which may be friction locked into a cap 27. Cap 27 is preferably integral with the gasket 14 which as indicated above may be molded of rubber, polyethylene or like resilient material. It will be appreciated that with cap 27 operatively engaging neck 26, a component within the inner container 24 is separated from any components confined between container 24 and outer container 10.

The purpose of depressing lever 23 will now be described assuming that the filled dispensing device is to be readied for use. In order to mix the components stored in the inner and outer containers, the user presses the discharge nozzle 15 in the direction of the arrow shown

in FIGURE 2. This causes a corresponding downward pressure on lever 23 which as stated will abut bottom 25 of inner container 24. The inner container 24 due to this pressure of lever 23 is detached from the friction-lock cap 27, and moves somewhat as indicated in FIGURE 1 to the position shown in dotted lines. For best results with most products the device is shaken to accomplish an intimate admixture of the now combined ingredients in order to ready the product for discharge.

A production line method of assembling compartmented dispensing devices in accordance with the present invention will now be described. The outer container 10 is partially filled with one of the components, or with a mixture of compatible components at a first filling station. Concurrently, the inner container 24 is filled with another component at a second filling station. The filled inner container is then passed to an assembly station at which pre-assembled units consisting of covers 11, discharge nozzle 15 and the associated structure including cap 27 are united to the inner container. At this time, cap 27 is friction-locked onto neck 26 of the inner container to seal off the component within the inner container. The discharge of units from this station is preferably correlated with the discharge of the partially filled corresponding outer containers from the first filling station. The sub-assemblies are then picked up by suitable gripping means or the like, and the covers 11 are placed in position upon the outer containers 10 with the inner containers positioned within the outer containers. Covers 11 may now be sealed to containers 10 by flanges 12 or any other suitable means such as double seaming. The assembled dispensing device may be pressurized in known manner with a propellant such as one or more of the Freons, hydrocarbons, nitrogen, argon or other suitable gas, depending upon the components and products involved. The dispensing device in this condition may be stored until use is desired, whereby pressure on the discharge nozzle 15 is effective to permit mixing of the components within the containers in the manner described above.

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 can be made therein without departing from the scope and spirit of the invention. For example, while the invention has been described in connection with a pressurized dispensing device, certain features of the invention may find use in a squeeze type of dispensing device. 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 compartmented dispensing device for separately storing ingredients of a multi-component pressure dispensing system until use is desired, comprising an outer container having an opening in one end thereof, dispensing valve means mounted in said opening for discharging the contents of the device to the atmosphere, an inner

container having an opening in one end thereof disposed within said outer container, a closure for said inner container mounted in said outer container opening supporting said inner container in said outer container, and means operatively connected to said valve means for disengaging said inner container and means connecting said valve means and said closure normally maintaining said disengaging means in its inoperative position; whereby a downward pressure exerted on said valve means effects disengagement of said inner container from said closure to permit communication between said containers.

2. A dispensing device according to claim 1 wherein the means operatively connected to said valve means include means projecting downwardly to abut a portion of said inner container to effect the disengagement from said closure.

3. A dispensing device according to claim 1 wherein the last mentioned means operatively connected to said valve means include an essentially elongated shaft member attached to valve means of said outer container, said member having at one end abutment means adapted to contact the bottom of said inner container.

4. A pressurized dispensing device for separately storing components of a multi-component system until use is desired, comprising an outer 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 said dispensing device including a discharge nozzle portion retained within said annular gasket; an annular closing means positioned to normally engage said valve seat in sealed engagement therewith, said discharge nozzle portion above and adjacent to said annular closing means being provided with at least one aperture therein, an inner container positioned within said outer container, a cap-like closure for said inner container integrally connected to the annular gasket, said closure being friction-lock connected to and supporting said inner container within said outer container, and a lever connected to said valve device and having means positioned to engage a portion of said inner container upon an inward movement of said discharge nozzle portion to thereby disengage said closure from said inner container to permit mixing of the contents of said containers.

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