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R. O. CHURCH ET AL

3,339,809

SELF-PRESSURIZING CONTAINER WITH VALVE

Filed Oct. 23, 1965

FIG. 1

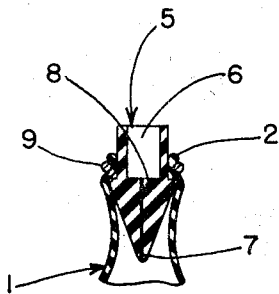
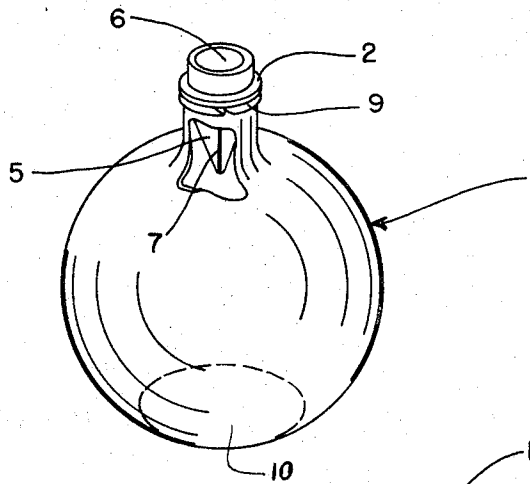


FIG. 2

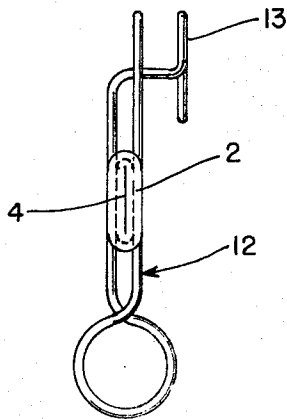


FIG. 3

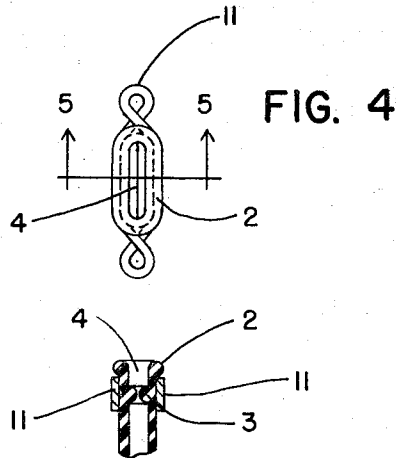


FIG. 4

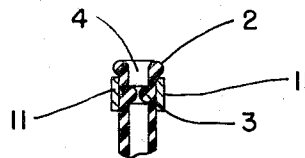


FIG. 5

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SELF-PRESSURIZING CONTAINER WITH VALVE
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1 Claim. (Cl. 222-215)

This invention relates to a novel package, and more particularly, to an elastic package that will contract when the contents of the package are expressed or removed therefrom. By this means, the internal volume of the package automatically will adjust to the volume of material remaining in the package.

Accordingly, it is an object of this invention to provide an elastic package of variable volume.

Another object of this invention is to provide a novel package of variable volume that continuously will adapt itself to accommodate to the volume of material contained therein.

Yet another object of this invention is to provide an elastic package of variable volume that may be filled with varying quantities of a fluent material.

Still another object of this invention is to provide a novel package that at all times will be substantially free from contained air, both at the time the package is originally filled with a fluent material and over the period of time that such material is dispensed from the package.

Briefly, these and other objects of this invention are achieved by providing an expandable elastic container that may be filled with any flowable material. The flowable material is charged into this package under pressure, and the elastic container expands to accommodate the flowable material as it is introduced into the package. When the package has been filled with a suitable quantity of the flowable material, the supply of material under pressure into the package is discontinued and a suitable valve is provided to secure the material within the package. When the valve means is open, the pressure of the side walls of the expanded elastic package and/or external pressure applied to the container as by hand pressure will cause the material within the container to flow out therefrom. As material is expressed from the container, the container will contract and adapt its volume to be sufficient only to contain the material remaining therein. This being the case, no air will fill the container, even after a major portion of the material has been withdrawn.

Advantageously, the package of this invention may be a sphere or an oblate spheroid. Such shape is especially convenient since, if the package is of suitable size, it may be easily grasped within the palm of the hand of the user. Not only will this permit ready control of the valve, but it also will enable the application of additional pressure from the hand should a more rapid flow of material from within the package be desired.

With reference to the accompanying drawings:

FIGURE 1 is a schematic view, partially cut away, of a package made in accordance with this invention;

FIGURE 2 is a sectional view in elevation showing a preferred valve means positioned within the orifice of the package;

FIGURE 3 shows a plan view of another type of valve means;

FIGURE 4 is a plan view of yet another type of valve means;

FIGURE 5 is a section taken through line 5-5 of FIGURE 4.

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In FIGURE 1, there is generally illustrated an expandable elastic container 1 having a lip portion 2 and a bottom portion 10. As can best be seen in FIGURE 2, a valve 5 is located within the confines of the lip of the orifice of the package and is secured by a retaining ring 9. The valve 5 is comprised of an external orifice 6 and an internal member 7. The member 7 is comprised of two flexible flap members having elongated, substantially flat faces that are adapted to seat against each other in pressure sealing relationship in order to contain material within the interior of the package 1. When the package is filled with a fluent material, a pressure will be maintained within the package and, accordingly, the fluent material within the package will exert a force upon the flaps 7 and tend to retain them in sealing relationship with each other. When the valve 5 is squeezed transverse of the plane of the faces of flaps 7, such as at 8, the flaps 7 will be spread apart to allow the release of fluent material from within the package.

Advantageously, the base portion 10 of the package 1 may be flattened so that if the package 1 is spherical, it will be stable when placed on a flat surface. If the package is comprised of a material such as rubber, the base portion 10 may be comprised of a slightly thicker section of rubber to form this flattened surface.

In FIGURE 3, a pinch clamp is shown as the valve means for securing the lip 2 of the package. The pinch clamp 12 has an operating thumb portion 13 which, when depressed, will allow the lip 2 to open and allow material contained within the package to flow through orifice 4.

In FIGURE 4, there is shown another valve means 11 comprised of a spring clip. When the ends of the spring clip are pressed together, the lips 2 can move apart and material contained within the package can flow out of orifice 4. Additionally, as shown in FIGURE 5, a beaded portion may be placed on the interior of the lip to aid in sealing the orifice 4 when the clip engages the lip portion of the package 1.

From the above description, it can be appreciated that the packaging device of this invention may be useful in packaging and dispensing many items. For example, there may be mentioned such items as drugs and cosmetics, tooth paste, foodstuffs and condiments, as well as lubricating fluids, paints, calking materials, and the like. A packaging device of this sort may be especially useful under conditions of zero gravity as, for example, to dispense food to astronauts when orbiting the earth.

Although certain embodiments of this invention have been shown in the drawings and described in the specification, it is to be understood that the invention is not limited thereto, is capable of modification, and can be rearranged without departing from the spirit and scope of the invention.

We claim:

A package comprising an expandable elastic container exerting continuous pressure on the contents, an opening in said container, and valve means associated with said opening for controlling the discharge of material from said container; said valve means including a pair of flexible flap members that extend from said opening into said container and are biased to normally seat in pressure sealing relationship with each other; said flap members having means to unseat and permit the discharge of material from said container when a force is applied adjacent the side edges of said flaps and to reseal in pressure sealing relationship with each other when such force is relieved, said flap members presenting surfaces to the ma-

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terial whereby said reseating is aided by the pressure
of said material within said elastic container.

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