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2,758,879

ATOMIZING CONTAINER

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FIG 1.

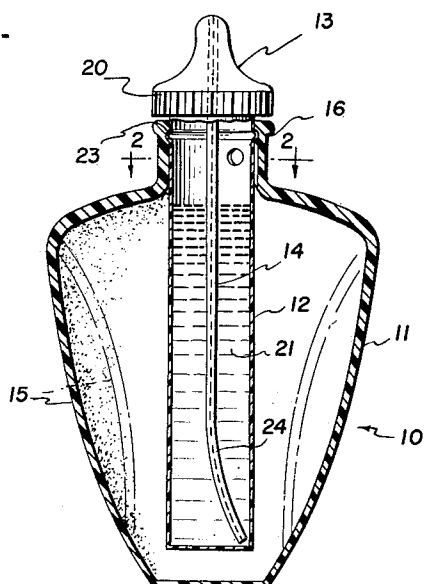


FIG 2.

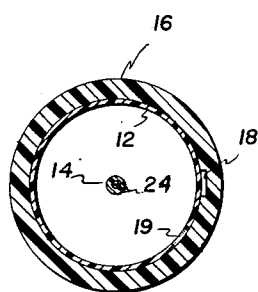


FIG 3.

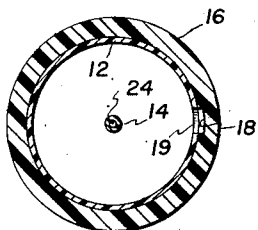
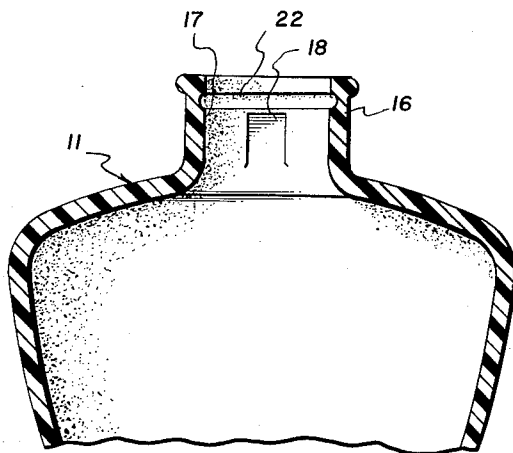


FIG 4.



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ATOMIZING CONTAINER

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1 Claim. (Cl. 299—90)

This invention relates to dispensing perfumes and aromatic liquids and more particularly provides a container of resilient construction which ejects a finely dispersed stream of its liquid contents upon application of pressure to its side walls. Such dispensers are commonly referred to as "squeeze bottles" and are conventionally constructed of polyethylene, rubber or a similar material.

The flexibility, resiliency and toughness of polyethylene in particular as a material of construction for squeeze bottles has revolutionized commercial practices in the packaging and dispensing of cosmetics and the like. I have found that polyethylene is, however, subject to a serious disadvantage when used in constructing bottles for containing and dispensing aromatics and perfumes. The chemical structure of the polyethylene plastic apparently permits aromatics to leak out quite rapidly with the result that perfume placed in bottles of this type disappears in a relatively short period of time. Perfume or aromatics placed in such a bottle at the time of manufacture may completely disappear before the product reaches the consumer.

The solution of this problem has been the object of considerable effort in the art. The best result of prior efforts has been to apply a coating on the interior surface of the polyethylene bottle in an attempt to reduce or stop leakage of aromatics and perfume. Such coatings, however, have been so far of no commercial importance since they tend to dry out, crack, and break away from the walls of the bottle and are unable to flex freely when the bottle is squeezed in use. The inevitable consequence of the use of interior coatings because of the cracking and breaking away from the walls of the bottle is contamination of the liquid contents. When this occurs prior to sale the packaged product becomes unsalable. Such contamination moreover can plug the eduction passages in the atomizer head and thus prevent proper functioning of the dispenser.

The atomizing dispenser of this invention overcomes these prior difficulties of containing and dispensing aromatics by providing an outer pressure bottle formed of a resilient material such as polyethylene which is completely closed except for the opening through its neck. A closed receptacle for containing the liquid to be dispensed and made of a material such as glass or other aromatic impermeable material is inserted within, and in tight sealing engagement through the neck opening of, the outer polyethylene pressure bottle. A communicating passage including a port in the upper end of the inner receptacle connects the interior of the inner receptacle with the interior of the outer resilient bottle. An eduction tube of restricted bore and open at each end depends within the inner receptacle having one end opening into the lower end of the inner receptacle and having its other end extending upwardly through the top of the inner receptacle to the exterior of the container in order to permit dispensing and atomizing of the liquid contained in the inner receptacle when pressure is applied to the walls of the outer bottle.

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In constructing the container of this invention I have found it necessary to provide a means for closing the communicating passage between the inner receptacle and outer bottle. This is accomplished by making a short vertical channel in the interior neck portion of the bottle and by making the inner receptacle rotatable with respect to the outer bottle so that the port in the upper end of the receptacle can be positioned to register with the channel in the neck of the bottle when dispensing is desired or can be positioned out of line with the channel when sealing is desired.

The drawings illustrate a particular example of a squeeze bottle according to this invention. In the drawings—

Figure 1 is a partially sectioned elevation of a bottle according to this invention;

Figure 2 is an enlarged cross-section taken at line 2—2 of Figure 1;

Figure 3 is an enlarged cross-section taken at the same line as Figure 2 with the inner receptacle rotated to register the port in its upper end with the channel in the neck of the bottle; and

Figure 4 is an enlarged partial cross-section of the upper end of the outer pressure bottle.

In the drawings the numeral 10 indicates a squeeze bottle for dispensing an atomized stream of aromatics or perfumes according to the principles of this invention. Atomizer 10 includes outer polyethylene bottle 11, inner plastic tubular receptacle 12, cap 13, and eduction tube 14.

Outer bottle 11 can be constructed in any desired shape which will provide elongated side walls 15 to be grasped and squeezed to apply the pressure necessary to dispense the liquid 21 confined within receptacle 12. The upper end of bottle 11 is provided with a narrow open neck 16 preferably of greater thickness than side walls 15. The opening in neck 16 is substantially cylindrical in order to provide an elongated sealing surface 17 which frictionally engages cylindrical container 12. In a portion of cylindrical neck surface 17 a short vertical channel 18 extends upwardly from the bottom of neck 16 ending below the top of neck 16.

In the upper portion of inner receptacle 12 a port 19 is located in a position which will permit port 19 to register with channel 18 upon rotation of inner receptacle 12 within container 11 as indicated particularly in Figures 2 and 3. Preferably cap 13 is provided with a knurled surface 20 to facilitate such rotation.

In operation of the device cylindrical receptacle 12, filled with liquid 21, is inserted into bottle 11 until cap 13 is substantially flush with the upper end of neck 16. Engagement in this position is advantageously accomplished by providing a circumferential bead 23 about the upper end of tube 12 positioned above port 19 which will snap into a complementary circumferential groove 22 in the upper end of neck 16 positioned above the end of channel 18.

In normal storage tube 12 is rotated to a position within bottle 11 as indicated in Figure 2 in which port 19 is out of registry with channel 18 thus preventing accidental dispensing of the liquid contents of tube 12 if, for example, bottle 11 is squeezed in handling, dropped or the like. In order to dispense the contents, tube 12 is rotated within bottle 11 by grasping knurled edge 20 of cap 13 and twisting it until the port 19 registers with channel 18 as shown in Figure 3. Suitably the exterior of the bottle 11 is provided with a vertical mark on neck 16 which is aligned with a similar vertical indication on cap 13 in order to facilitate registering port 19 with channel 18 which cannot ordinarily be observed from the exterior of the bottle.

The upper end of the bottle is then pointed at the sur-

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face upon which it is desired to apply a part of the liquid contents of the bottle. Side walls 15 are then squeezed as in the indicated dotted line position, thus compressing the air contained within container 11 and pneumatically displacing the upper surface of liquid 21 within receptacle 12 because of the open communication between the interiors of receptacle 12 and bottle 11 through registered port 19 and channel 18. This pneumatic displacement forces liquid 21 upwardly through bore 24 of eduction tube 14 into the air in a stream of finely dispersed droplets.

The improvement described above provides efficient and sure mechanical means for overcoming leakage of perfumes and aromatics from squeeze bottles since the liquids are contained in an inner tube formed of glass, or a plastic, such as Styron or other material which is impermeable to aromatics, and the liquids are thereby kept out of contact with the permeable outer container. The small port provided reduces the area of contact of the aromatics with the polyethylene to a very small surface and possible loss is thereby reduced to a negligible amount. Thus it is possible to utilize the atomizing feature of a polyethylene container without a concomitant loss of perfumes or aromatics within the wall of the polyethylene container.

Suitably the inner receptacle may be sold as a separate unit without the outer pressure bottle, thus decreasing the packaging requirements and permitting use of the outer bottle a number of times. It should be noted that many cosmetics besides aromatics and perfumes tend to discolor materials such as polyethylene. The bottle of my invention obviously prevents this occurrence and thus improves the attractiveness of the packaged product for long periods.

Generally, the insert tank should have approximately one-half the capacity of the polyethylene bottle, thus

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assuring sufficient air space to permit compression of the outer bottle to operate the atomizer and yet providing sufficient capacity to avoid frequent replacement of the inner receptacle. The fact that the inner tank container must necessarily be smaller in volume than the outer container is of no great consequence since the conventional polyethylene atomizer type bottle can never be filled more than about two-thirds without destroying its ability to atomize.

I claim:

An atomizing container comprising an outer bottle formed of resilient flexible material having a closed bottom, a substantially cylindrical open neck portion in said bottle, a cylindrical tubular closed receptacle having an outer diameter substantially equal to the inner diameter of said neck portion removably and rotatably inserted through said neck portion in said resilient bottle, an eduction tube depending from the upper end of said cylindrical receptacle providing communication between the exterior of said receptacle at its upper end with the interior of said receptacle at its lower end, a port formed in the upper end of said cylindrical receptacle, and a channel extending vertically in said neck of said resilient bottle from the lower end of said neck to a position below the upper end of said neck, said port and said channel being registerable by rotation of said cylindrical receptacle with respect to said bottle to define a passage closed to said eduction tube and communicating the interior of said cylindrical receptacle with the interior of said resilient bottle.

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