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3,334,790

PACKAGE FOR DISPENSING LIQUIDS

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Fig. 1

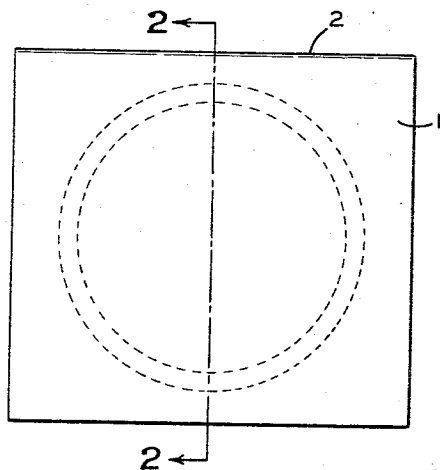
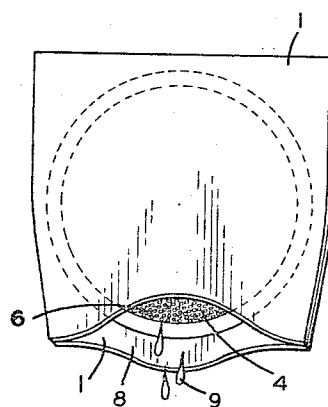
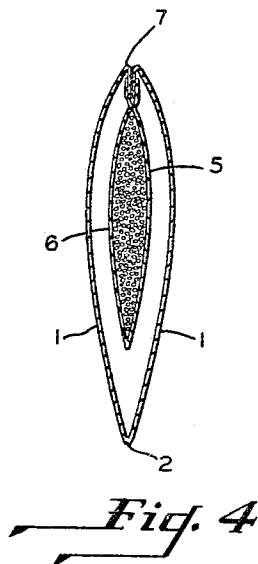
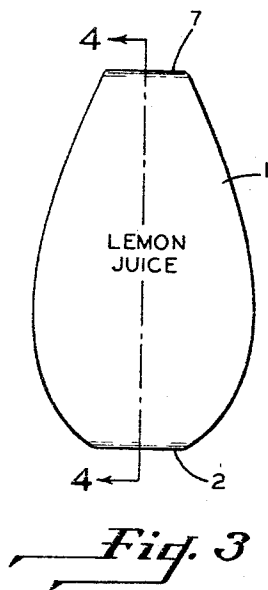
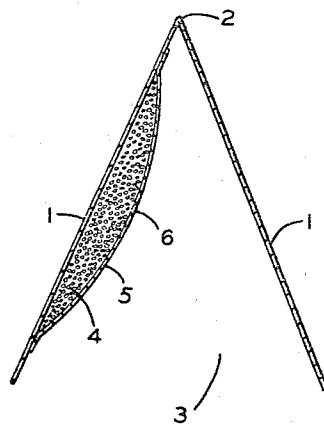


Fig. 2



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1

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PACKAGE FOR DISPENSING LIQUIDS

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This invention relates generally to a package for containing relatively small amounts of liquids and creams. More particularly, the invention relates to a liquid package adapted to dispense a few drops of a liquid when needed. Still more particularly, the invention relates to a liquid package for dispensing small amounts of flowable liquids by simple finger pressure, the used package being readily disposable.

There is a need for a simple and easy-to-use package for dispensing a few drops of a liquid when the liquid is needed. Such a liquid package finds use in the kitchen, home workshop, hunting camps, picnic grounds, boats, aircraft, and a multitude of other places where a few drops of a liquid are needed for any of a wide variety of purposes.

It is a primary object of the present invention to supply that need.

The invention contemplates a package comprising an inner pouch having a porous wall and containing a plurality of pressure-rupturable capsules. The capsules are in a size range of about 25-3500 microns, and these capsules contain the liquid to be dispensed. Partially enclosing the pouch are flexible outer sheets impermeable to the liquid in the capsules. To dispense the liquid in the capsules, finger pressure is exerted through the walls of the outer sheets against the capsules contained in the inner pouch, rupturing them, and allowing the liquid content to pour out and fall from the package as drops and droplets.

The capsules may be produced by the apparatus described in U.S. Patent No. 3,015,128, Somerville. Processes of encapsulation are set forth in U.S. Patent No. 2,766,478, Raley et al. The capsules produced should be at least 25 microns in size in order that the proportion of the liquid encapsulated be sufficiently great to allow droplets to pour forth when the capsules are ruptured. On the other hand, capsules larger than about 3500 microns render the thickness of the present package unwieldy and inconvenient. Larger sizes will be preferred in this range to help allow actual drops to fall from the package when the capsules are ruptured. A plurality of capsules will be used in order that control can be had over the number of droplets to be released by finger pressure on the package. A few of the capsules may be crushed to dispense a few droplets in one area, and the balance of the capsules may be crushed to dispense the balance of the liquid in another area. Hence controllable amounts of the liquid can be released as desired. The number of capsules will normally be in the range of about 10-200 depending on the nature of the liquid inside the capsules. The package normally will need to produce fewer drops of a potent liquid such as garlic oil than a liquid such as lemon juice.

A wide variety of aqueous and non-aqueous liquids, solutions, suspensions, and emulsions may be used. Oils that contain spices, or flavorings, and olive oil and vegetable oils of all kinds may be encapsulated and used. Vinegar, either plain or spiced, garlic oil, lemon juice, lime juice, or other fruit juices and flavorings may be encapsulated and dispensed in the package of the present invention. Lubricating or special purpose oils for guns or tools may be dispensed. Soap or detergent solutions, skin lotions, and abrasion-treating medications such as Mer-

2

curochrome, tincture of iodine, or any other tinctures may be used. Liquid adhesives can be dispensed. Special flavorings such as bitters or anisette may be used.

The capsules containing the desired liquid will be placed inside a flexible inner pouch. The pouch may be a woven or non-woven, flexible web of cellulosic, synthetic, or inorganic fibers. It is preferred that the pouch be non-absorbent as to the liquid contained in the capsules in order to minimize hold-up of the liquid being dispensed. Any convenient means of sealing the capsules in the pouch may be used as by sewing, adhesive sealing, heat sealing, folding, or the like. The entire pouch may be porous, but the only requirement of the pouch is that the liquid in the capsules run out of the pouch in the form of drops and fall on the object to be treated once the capsules have been ruptured. Hence a small region in one or more of the walls of the pouch is all that need be porous. The pouch wall material may itself be impermeable if holes or other apertures exist in the pouch walls or a region thereof in order that the liquid in the capsules may drain out of the pouch. In such instances, the pouch may be made of a metal foil or a wet-strength paper with sufficient small holes punched through the pouch surface to deliver the liquid.

The pouch is mounted between flexible outer sheets impermeable to the liquid to be dispensed. These outer sheets at least partially enclose the pouch in the sense that the fingers will press against the outer sheets and exert pressure through the outer sheets to the capsules in the pouch which is contained between the outer sheets. The outer sheets may themselves form a pouch having a small opening out of which the liquid may run. Alternatively, the outer sheets may simply be a single impermeable sheet folded in half with the pouch positioned inside between the opposing interior surfaces of the sheet. The material of the sheets themselves may be a non-porous version of the pouch, or they may be any of the synthetic resin or rubber films, wet strength papers, impermeable fabrics either woven or felted, or the like.

The invention will be better understood by reference to the accompanying drawing in which:

FIG. 1 is a view of one embodiment of the package of the present invention with the pouch in the interior shown in dotted lines;

FIG. 2 is a sectional view of the package of FIG. 1 taken along the line 2-2;

FIG. 3 is a view of a different embodiment of the present package;

FIG. 4 is a sectional view of FIG. 3 taken along the line 4-4; and

FIG. 5 is a view of still another embodiment of the package of the invention.

Referring to FIGS. 1 and 2, the outer sheet 1 is creased at 2 to form the interior space 3. The pouch 4 has the porous wall material 5 containing in the inside thereof the capsules 6. In this embodiment, the pouch 4 is formed by circularly adhering the porous wall material 5 to the interior surface of the impermeable sheet 1.

Referring to FIGS. 3 and 4, the impermeable sheet 1 is folded at the fold 2 and folded again to join a tab of the pouch wall material 5 at the overlapping region 7. The capsules 6 are again positioned in the interior of the porous pouch wall material 5. The words "Lemon Juice" as shown in FIG. 3 indicate a convenient way to designate the contents of the package.

Referring to FIG. 5, the impermeable outer sheets 1 almost completely envelop the pouch 4, there remaining an opening 8 through which the contents of the capsules 6 may pour in the form of drops 9 once the capsules have been ruptured by finger pressure. The pouch 4 may be separately fabricated and adhesively secured to the in-

3

terior surfaces of the opposing sheets 1, or the pouch may be formed by adhering material to the interior surfaces of the sheets 1 to serve as part of the actual walls of the pouch.

I claim:

1. A package for dispensing drops of liquids comprising an inner pouch having a porous region in the walls thereof and containing a plurality of pressure-rupturable capsules having a size range of about 25-3500 microns and containing the liquid to be dispensed, and flexible outer sheets impermeable to said liquid partially enclosing said pouch, said pouch being mounted between said flexible outer sheets, said pouch and said outer sheets being adapted to allow said liquid to run out of said pouch in the form of drops when said capsules are ruptured.

2. A package according to claim 1 wherein all the walls of said inner pouch are porous.

3. A package according to claim 1 wherein an interior

4

surface of said flexible outer sheets serves as part of the walls of said inner pouch.

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