United States Patent

Ketner

[15] 3,636,922

[45] Jan. 25, 1972

[54] FLUID APPLICATORS

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[52] **U.S. Cl.** **118/264,** 128/260

[51] **Int. Cl.** **B05c 11/10**

[58] **Field of Search** 118/264; 128/156, 260, 268; 15/209

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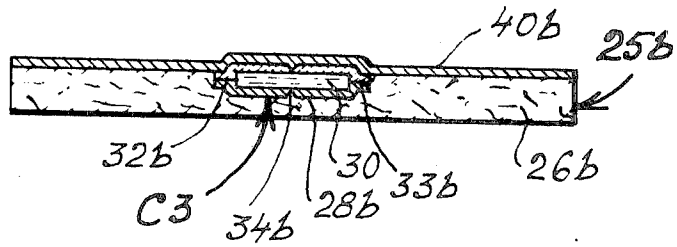
Primary Examiner—Louis K. Rimrodt

Attorney—Polachek & Saulsbury

[57] **ABSTRACT**

A fluid applicator comprises a sheet, pad, ball or other shaped body made of porous material. Inside the body is one or more sealed nonporous pouch, capsule, bag or other container having one or more compartments enclosing liquid, lotion, cream, paste, salve or other fluid or semifluid substance. The container is frangible and will open under pressure to release the fluid into or through the nonporous material for application to a surface to be treated. One side of the porous body may be covered by a nonporous, moistureproof material to prevent penetration of the fluid through the covered side.

5 Claims, 23 Drawing Figures



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SHEET 1 OF 3

Fig. 1.

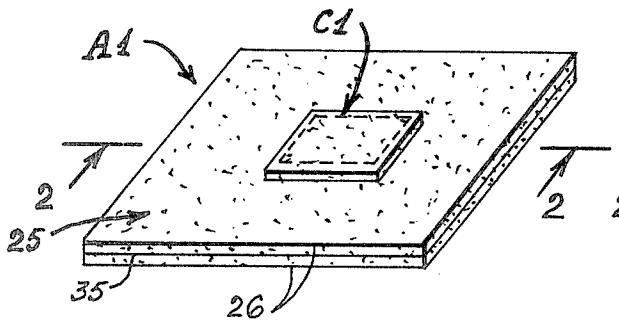


Fig. 2.

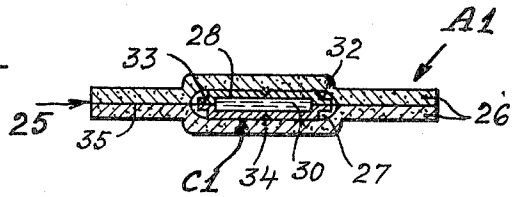


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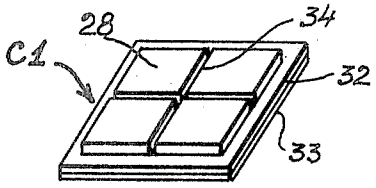


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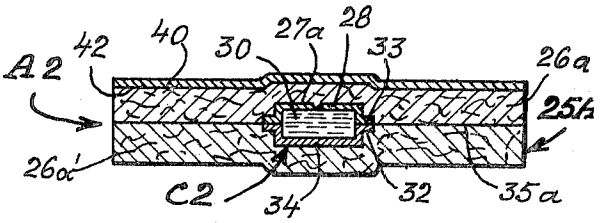


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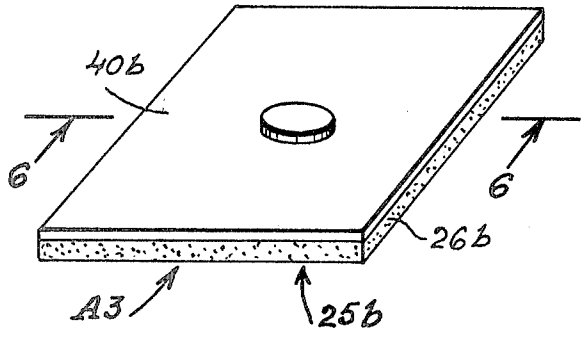


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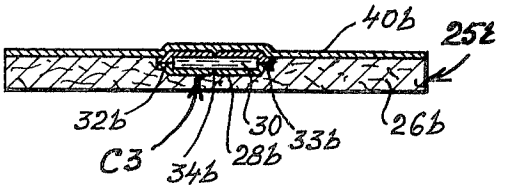


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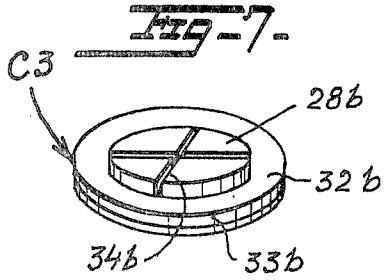
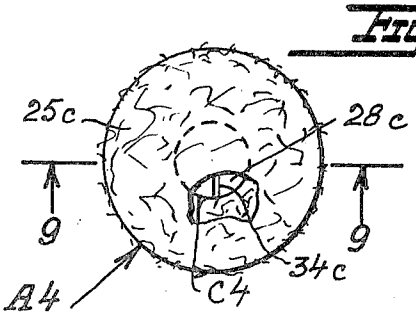


Fig. 8.



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Fig. 9.

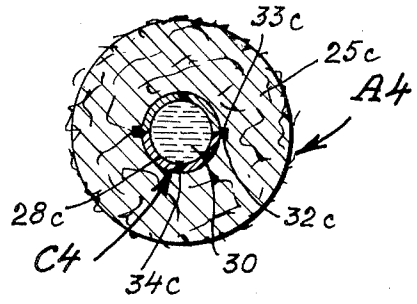


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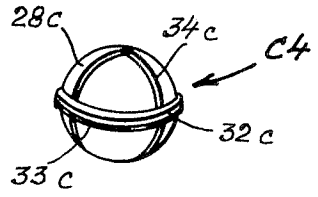


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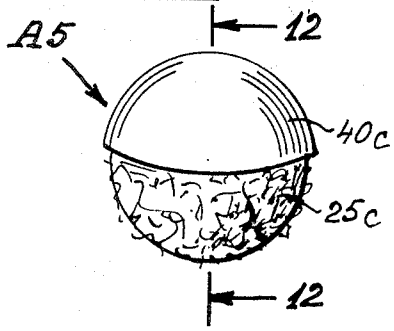


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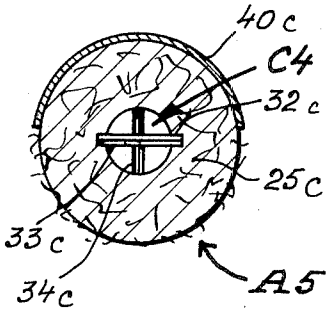


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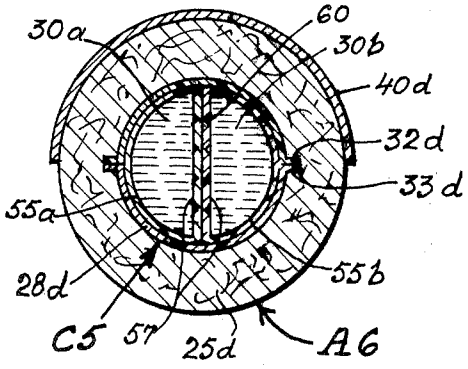


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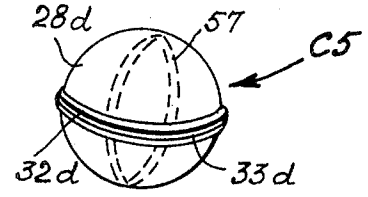
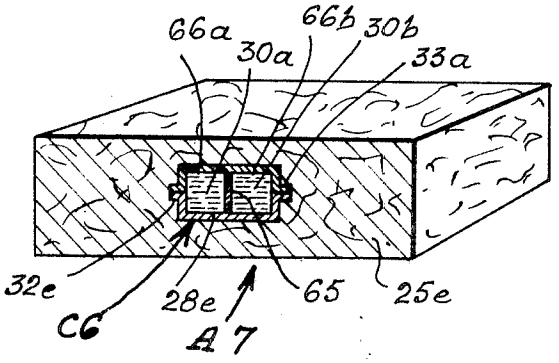


Fig. 15.



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Fig. 16

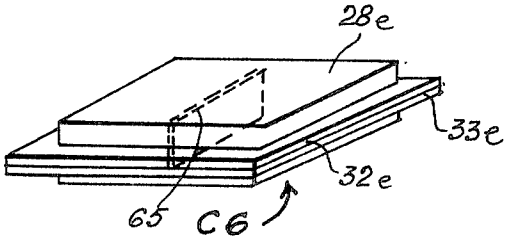


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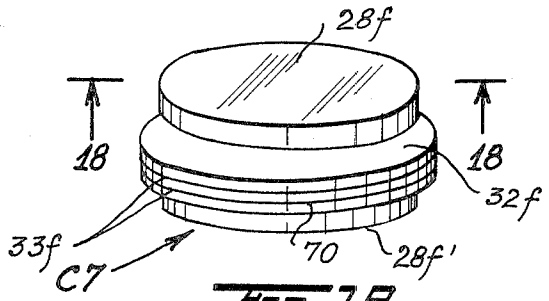


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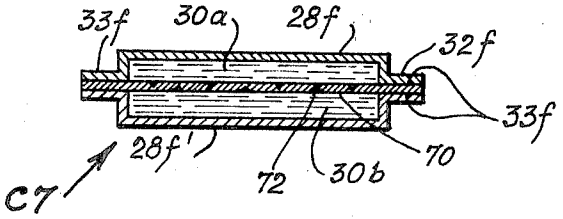


Fig. 19

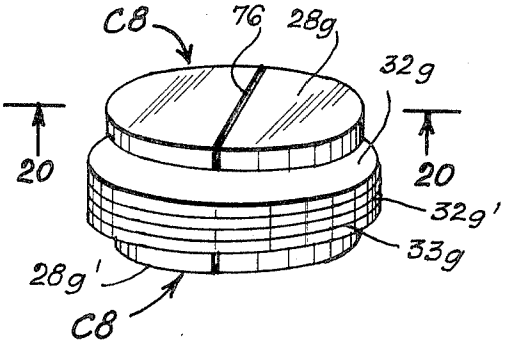


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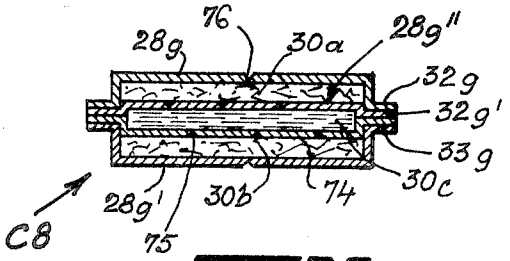


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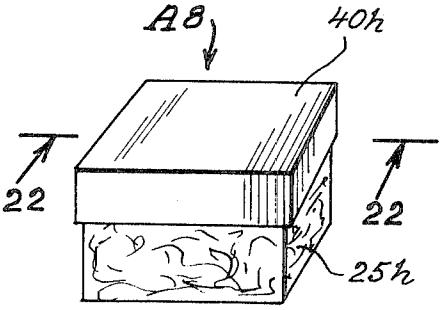


Fig. 22

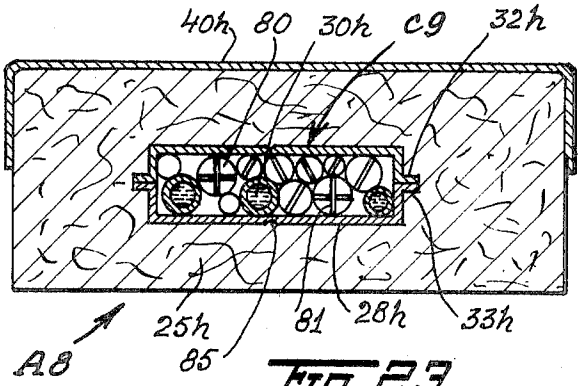
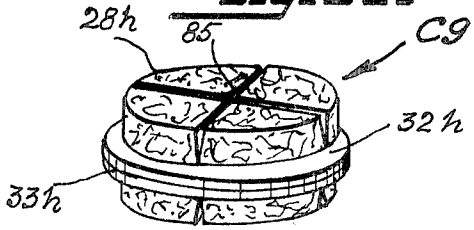


Fig. 23



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FLUID APPLICATORS

This invention relates to the art of fluid applicators and more particularly concerns an applicator having a porous body for applying a liquid or semifluid substance to a surface, the porous body enclosing a container or plurality of containers which have one or more fluids therein.

It has been proposed heretofore to provide a bandage with an attached or enclosed capsule containing a liquid. Such devices are shown in U.S. Pat. Nos. 2,336,024 and 3,366,112. In U.S. Pat. No. 2,336,024 the capsule forms part of a tissue and is exposed when the tissue is opened. The contents of the capsule are not dispensed through the tissue. In U.S. Pat. No. 3,366,112 a capsule is partially enclosed in an adhesive bandage. The capsule being exposed when the bandage is opened. Other structures have been proposed of which U.S. Pat. No. 3,306,292 is typical, in which a multilayer, toroidal-shaped capsule is disposed in a bandage. The capsule however is not enclosed in a porous body used as an applicator.

According to the present invention, a porous body which may have one, two or more layers or sheets of porous material encloses a container made of thin, nonporous film or foil material. Inside the container is a fluid or semifluid material such as a liquid, lotion, paste, salve, polish or the like. The fluid is released by applying pressure to the container through the porous body which ruptures the container. The released fluid disperses and permeates the porous body. The applicator can then be applied to the surface to be treated. Such surface may be rigid or flexible, porous or nonporous, rough or smooth. The treatment may involve cleansing, polishing, painting, medicating, oiling, etc. Instead of sheets of porous material, the porous body may be a mass or wad of absorbent material such as cotton, felt, or the like. The applicator may be rectangular, round or of other geometrical shape. It may have flat or curved sides. It can be disk-shaped, spherical, cubical, etc. Inside the container may be one or more walls dividing it into compartments which contain different fluids. The container can be constructed so that the inner walls break first under pressure to mix the fluids before the walls of the container break to release the mixture into the surrounding porous body.

It is therefore one object of the invention to provide applicator means for delivering liquids, fluids and semifluids such as creams and pastes in a predetermined quantity, releasable at will.

Another object is to provide a fluid applicator in which a predetermined quantity of a fluid is safely enclosed and hermetically sealed so that it can be stored or carried but which is ready for dispensing the fluid at any time.

A further object is to provide a fluid applicator comprising a porous possibly absorbent body in which is a frangible container having one or more compartments containing one or more fluids, the body possibly having one side covered by a nonporous protective member to protect the user's fingers from contact with the fluid while permitting passage of the fluid out of the other side of said body.

A further object is to provide a fluid applicator as described, wherein the plurality of compartments in the container are defined by individual frangible capsules of the same or different sizes and containing the same or different fluids.

The above and other objects and advantages of the invention will become apparent from the following detailed description taken together with the drawings, wherein:

FIG. 1 is a perspective view of a first fluid applicator embodying the invention.

FIG. 2 is a cross-sectional view taken on line 2—2 of FIG. 1.

FIG. 3 is an enlarged perspective view of a capsule per se employed in the applicator of FIG. 1.

FIG. 4 is a cross-sectional view similar to FIG. 2 showing the internal construction of a second applicator according to the invention.

FIG. 5 is a perspective view of a third fluid applicator.

FIG. 6 is a cross-sectional view on an enlarged scale taken on line 6—6 of FIG. 5.

FIG. 7 is an enlarged perspective view of the capsule employed in the applicator of FIGS. 5, 6.

FIG. 8 is a side view of a fourth fluid applicator, part being broken away to show the fluid container inside.

FIG. 9 is a cross-sectional view taken on line 9—9 of FIG. 8.

FIG. 10 is an oblique view of the fluid container per se employed in the applicator of FIGS. 8, 9.

FIG. 11 is an oblique view of a fifth fluid applicator.

FIG. 12 is a cross-sectional view taken on line 12—12 of FIG. 11.

FIG. 13 is an enlarged cross-sectional view similar to FIG. 12 showing the internal construction of a sixth fluid applicator.

FIG. 14 is an oblique view of the fluid container employed in the fluid applicator of FIG. 13.

FIG. 15 is a perspective view partially in section of a seventh fluid applicator.

FIG. 16 is a perspective view on an enlarged scale of the fluid container employed in the applicator of FIG. 15.

FIG. 17 is a perspective view of another fluid container employable in a fluid applicator.

FIG. 18 is a cross-sectional view taken on line 18—18 of FIG. 17.

FIG. 19 is an oblique view of a further fluid container employable in a fluid applicator.

FIG. 20 is a cross-sectional view taken on lines 20—20 of FIG. 19.

FIG. 21 is a perspective view of an eighth fluid applicator.

FIG. 22 is a cross-sectional view on an enlarged scale taken on line 22—22 of FIG. 21.

FIG. 23 is a perspective view of the fluid container employed in the fluid applicator shown in FIG. 22.

In the following detailed description of the invention the term "fluid" is intended to mean a flowable substance of any viscosity. The viscosity may range from that of water substances such as alcohol and ether through that of creams and oils to that of highly viscous substances such as pastes and waxes.

Referring now to the drawings, there is shown in FIGS. 1 and 2 a first fluid applicator A–1. This applicator comprises a body 25 made of two porous sheets 26. The sheets are juxtaposed face-to-face and are bonded to each other. These sheets may be made of fibrous, cellular, plastic or the combination thereof; such as, blotting paper, sponges, cloth cellulose, plastic which may be perforated, and the like which are highly porous. They are sufficiently liquid resistant to retain their shape when wet by the fluid which they apply. Between the sheets is a chamber 27 in which is a container C1; see FIGS. 2. The container is a closed hermetically sealed member with frangible walls 28. The container is rectangular in plane view and contains a fluid 30. The edges 32 of the walls are abutted to form a breakable seal 33 all around the container. The walls being weakened by scored lines 34 so that the container will break all around its periphery and at the sides when pressure is applied manually at opposite sides of the applicator. Under exerted pressure the walls 28 of the container, could rupture at points other than the weakened areas. The walls 28 of the container are nonporous. They may be made of any suitable material such as metal foil, rigid or flexible plastic material or the like, which if desired, may be laminated. The walls 28 are bonded at edges 32 by heat, pressure, cementing, crimping or any other suitable method, provided that the seal 33 formed at the abutted edges will break under pressure to release fluid 30 into the porous possibly absorbent sheets surrounding the container. The applicator can be used for applying cleanser, polish, medicament, cosmetic, paint, oil, etc., to any suitable surface to be treated. If desired, the scored walls 28 can be weaker than the seal 33 of the edges 32 so that the walls break laterally first to release a controlled amount of fluid. Further pressure then breaks the seal 33 to open the container all around and release all the fluid into the surrounding porous, possibly absorbent sheets 26. The juxtaposed faces 35 of sheets 26 can be bonded together at all

points of surface contact, only or in spots, lines or areas thereof.

FIG. 4 shows applicator A2 having a body 25*a* formed by two thick rectangular pads 26*a*, 26*a'*. The pads are bonded together at juxtaposed faces 35*a*. Embedded in chamber 27*a* is container C2 which is similar to container C1. Otherwise, parts of container C2 corresponding to those of container C1 are identically numbered. Covering one side 42 of one pad 26*a* is a thin nonporous sheet, possibly metal or plastic. This sheet is nonporous to prevent penetration of fluid 30 through side 42 of pad 26*a* on the applicator after the fluid is released by breaking container C2. Although two pads are shown in applicator A2 it is possible to make the porous body from a single thick pad with container C2 embedded in the center of the pad.

Applicator A3 shown in FIGS. 5 and 6 is rectangular. It includes a porous, possibly absorbent, body 25*b* made of a single thick porous pad or sheet 26*b* of any thickness. Nonporous sheet 40*b* covers one side of the pad. Container C3 is disk-shaped as clearly shown in FIGS. 6 and 7. Peripheral marginal edges 32*b* of the container are abutted and bonded to form seal 33*b*. Fluid 30 is retained in the hermetically sealed container. Scored lines 34*b* on one or both circular walls 28*b* of the container may be weaker than seal 33*b* to break first when pressure is initially applied, and then seal 33*b* will break as further pressure is applied to permeate the pad with the fluid in concentrated amounts to a specific part of the surface of the porous body 25*b*.

Applicator A4 shown in FIGS. 8 and 9 has a spherical, porous body 25*c*. Inside the porous body is a spherical container C4. The container has radial annular edges 32*c* joined to form a breakable seal 33*c*. The spherical container has two nonporous hemispherical walls 28*c* joined at edges 32*c*; see FIGS. 9 and 10. When pressure is applied to the spherical body 25*c*, the container will break at scored lines 34*c*. When further pressure is applied, the circumferential seal 33*c* will open. The fluid 30 will saturate body 25*c* so that it can be used as an applicator pad.

Applicator A5 of FIGS. 11 and 12 employs the same spherical porous body 25*c* as applicator A4 in which is embedded frangible container C4. A hemispherical nonporous cover 40*c* is applied to one side of body 25*c* to serve as a handle and prevent penetration of fluid 30 at that side.

Applicator A6 of FIG. 13 has a spherical porous body 25*d* covered on one side with hemispherical nonporous sheet 40*d*. Inside body 25*d* is a spherical container C5. The hemispherical nonporous walls 28*d* of the container are joined by a circumferential seal 33*d* between radial annular flanges 32*d*; see FIG. 14. Inside the container are hemispherical capsules 55*a* and 55*b* defining two compartments in which are two different fluids 30*a*, 30*b*. Flat circular walls 57 of the two capsules are abutted. These walls are weakened by scored lines 60. When pressure is applied to container C5, as body 25*d* is squeezed, walls 57 will become distorted and will then break to mix fluids 30*a*, 30*b* together. Then as further pressure is applied the seal 33*d* will break to release the mixture of fluids into porous body 25*d*. The saturated porous body can then be used as an applicator pad to apply the fluid mixture to any desired surface.

Fluid applicator A7 as shown in FIG. 15 has a rectangular porous body 25*e* in which is embedded a rectangular container C6. Container C6 has peripheral edges 32*e* of rectangular walls 28*e* abutted and secured by a breakable seal 33*e*; see FIG. 16. Inside the container is a central dividing wall 65. The wall divides the container into capsules or compartments 66*a*, 66*b* containing different fluids 30*a* and 30*b* respectively. The thin wall 65 will become broken or displaced when pressure is applied to the container via body 25*e*. The fluids will then mix in container C6. Thereafter the seal 33*e* will break as further pressure is applied to discharge the fluid mixture into the porous body.

FIGS. 17 and 18 show another container C7 which can be used in place of any of other containers C1–C6 in the applicator pads previously described. Container C6 is round and has two opposed cup-shaped walls 28*f*, 28*f'*. Radial annular edges 32*f* of walls 28*f* are abutted to a circular wall or partition 70 disposed between walls 28*f*, 28*f'* and secured by seals 33*f*. The cup-shaped walls 28*f* and 28*f'* define two capsules filled with two different fluids 30*a*, 30*b*. Wall 70 may have scored lines 72 to weaken it and cause it to break before seals 33*f* for mixing the fluids before the mixture is discharged in the porous body of the applicator pad in which it will be placed.

FIGS. 19 and 20 show another container C8 having three compartments defined by two nonporous cup-shaped walls 28*g*, 28*g'* and a disklike capsule 28*g''* interposed between the walls 28*g*, 28*g'*. In addition the two different fluids 30*a* and 30*b* in the container are separated by capsule 28*g''* which contains a third different fluid 30*c*. Nonporous walls 74 of capsule 28*g''* are scored by lines 75 so that they will break first before seals 33*g* formed between radial annular flanges 32*g* and 32*g'* of the walls 28*g*, 28*g'* and 28*g''*. Container C8 can be used in place of containers C1–C7 in all the applicators previously described. If desired further score lines 76 stronger than scored lines 75 but weaker than seals 33*g* can be formed in walls 28*g*, 28*g'*.

FIGS. 21 and 22 show another applicator A8. Rectangular porous pad 25*h* is covered by a nonporous protective sheet or plate like 40*h* applied to one side of the body. Inside pad 25*h* is a disklike container C9 best shown in FIGS. 22 and 23. This container has two cup-shaped walls 28*h* secured together by a breakable seal 33*h* between radial annular flanges 32*h*. Inside the container is a multiplicity of spherical capsules 80 of different sizes containing different fluids 30*h*. The capsules have scored lines 80 formed on their nonporous breakable walls. These capsules will break at different times depending on the applied pressure to provide a controlled release of different fluids. Two or more different fluids can be mixed by breakage of two or more capsules. Usually the capsules will break inside the container which will then break at both seal 33*h* and at score lines 85. Capsules C9 can be used in any of the other applicator pads previously described.

In all forms of the invention described one or more fluids are enclosed in nonporous breakable containers for saturating a porous applicator pad in which the containers are embedded. If desired, two or more containers of different fluids can be provided in the same applicator pad for dispensing different fluids or a single container may have more than one compartment or capsule containing different fluids. The containers can be provided separately from the pads. The user can insert successive containers into a single pad. Thus one porous pad may be used over and over again for a succession of containers.

Although a limited number of applicator pads and containers have been described, many other variations are possible within the scope of the invention.

What is claimed is:

1. A fluid applicator comprising a porous, flexible body adapted to serve as an applicator pad; a first container means embedded in said body, said container having flexible walls joined by a breakable seal defining a hermetically closed chamber; a quantity of a first fluid in said container means dispersible in said body to permeate the same when said seal is broken by application of pressure to said walls to release the fluid from the container means; a nonporous cover on one side of said body to prevent passage of said fluid through said one side of the body when the fluid is released from said container means; additional structure defining at least a second container means having flexible walls joined by a second breakable seal defining a second hermetically closed chamber; a quantity of a second fluid, different from said first fluid, in said second container dispersible in said body such that mixing with said first fluid takes place when said second seal is broken by application of pressure to the second container means' walls to release said first and second fluids from their respective container means.

2. A fluid applicator, according to claim 1, in which said body is rectangular in form.

3. A fluid applicator, according to claim 1, in which said body is spherical in form.

4. A fluid applicator, as defined in claim 1, in which said body is disk-shaped.

5. A fluid applicator, according to claim 1, in which said first container means' walls have abutted peripheral edges, and in which said first seal is formed between said edges of the walls of said first container means, said walls of said first container means having scored linens to weaken the walls thereat, so that the walls break on said scored lines and at said first seal when sufficient pressure is applied externally to said body.

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