

[54] TWO-COMPARTMENT CONTAINER 3,856,138 12/1974 Maekawa et al..... 222/142.5

[75] Inventors: Nicholas W. Kachur, Clark;
Anthony F. Tomburro, Cranford,
both of N.J.

Primary Examiner—William Price
Assistant Examiner—Douglas B. Farrow
Attorney, Agent, or Firm—Nichol M. Sandoe

[73] Assignee: Gibson Associates Incorporated,
Cranford, N.J.

[22] Filed: Mar. 4, 1975

[57] ABSTRACT

[21] Appl. No.: 555,138

[52] U.S. Cl. 206/221; 215/6; 215/DIG. 8;
222/142.5; 128/272.1; 259/48; 259/DIG. 20

[51] Int. Cl.² B65D 25/08

[58] Field of Search ... 206/219, 221; 215/6, DIG. 8;
222/142.5; 128/272.1; 259/48, DIG. 20;
220/20.5

A two-compartment container for separate storage of two ingredients of a product for eventual mixing comprises a bottle and a stopper and capsule assembly mounted on the bottle. A tubular capsule is slidably mounted in a tubular sleeve of the stopper to move between upper and lower terminal positions. In the lower terminal position the capsule is sealed, but when the capsule is moved to its upper terminal position, apertures in the sleeve are opened which permit the contents of the capsule to drop into the bottle. The upper end of the capsule is closed by a cap which is provided with a frangible portion which may be broken to provide an aperture through which the contents of the container may be discharged.

[56] References Cited
UNITED STATES PATENTS

2,382,978	8/1945	Curry.....	206/221
3,070,094	12/1962	Sarnoff et al.	128/272.1
3,139,180	6/1964	Kobernick	220/20.5
3,613,955	10/1971	Wetherell, Jr.	215/DIG. 8

5 Claims, 5 Drawing Figures

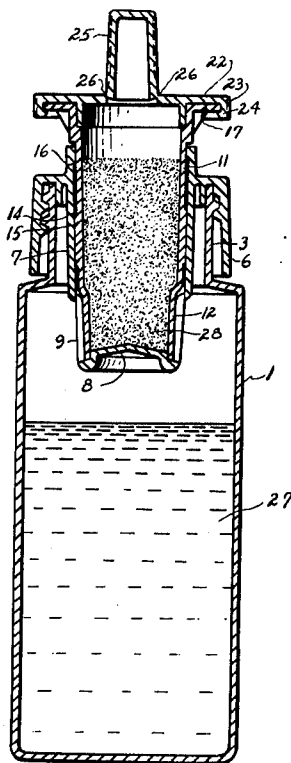


FIG. 1

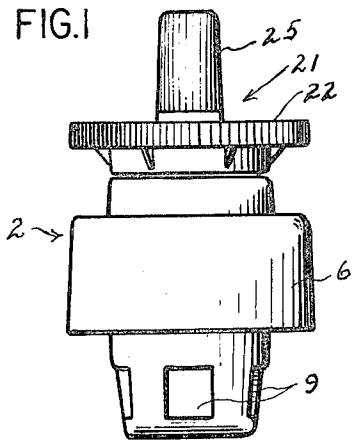


FIG. 2

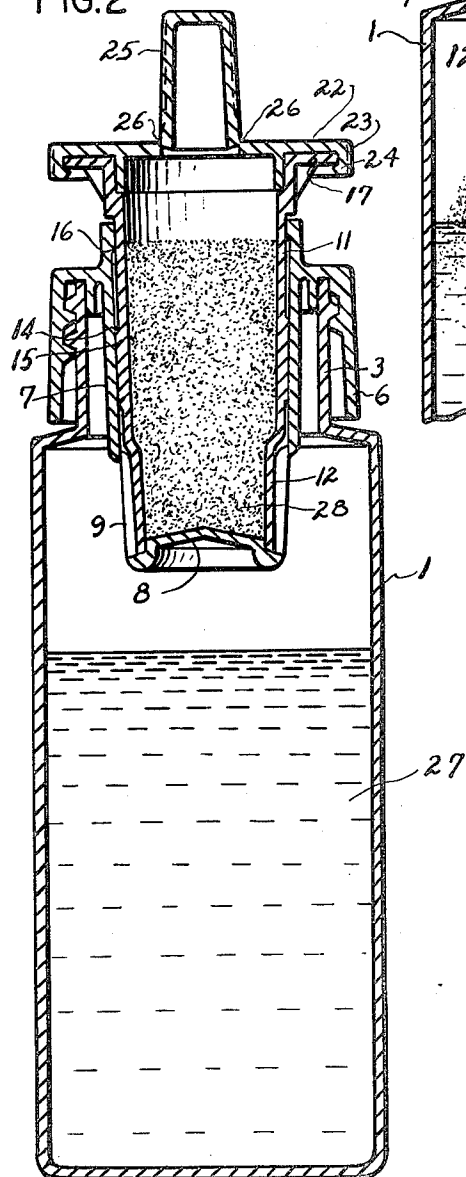


FIG. 3

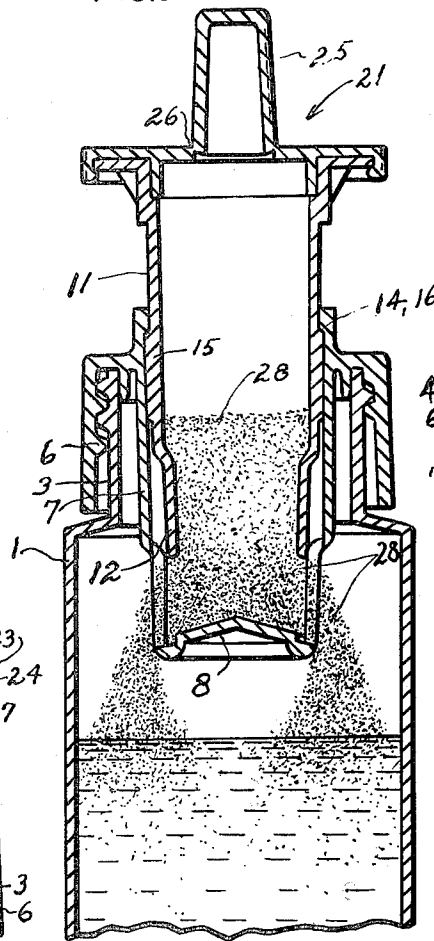


FIG. 4

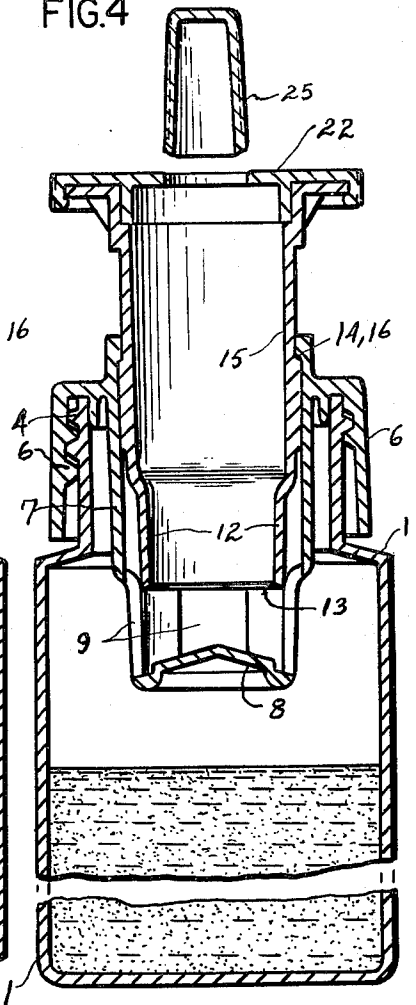
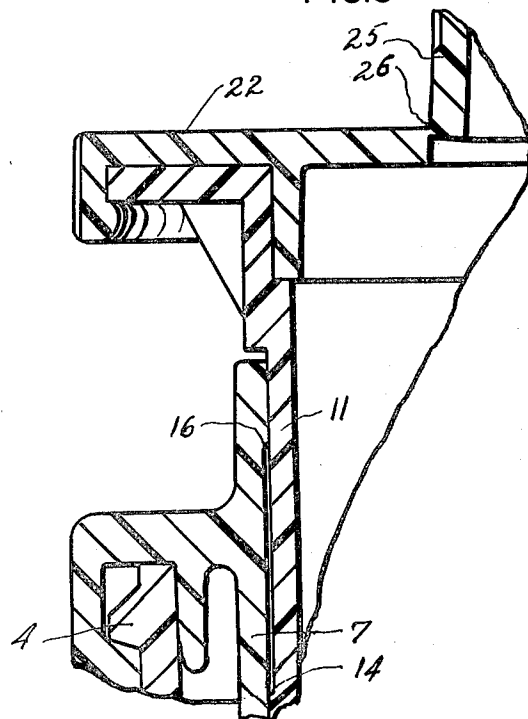


FIG. 5



TWO-COMPARTMENT CONTAINER

This invention relates to containers and pertains more particularly to containers having two compartments in which two ingredients of a product may be stored separately until it is desired to mix them, at which time it is possible to establish communication between the compartments so that the separated ingredients may move from one compartment to the other.

Such containers are useful for a variety of products, and more particularly for products in the fields of pharmaceuticals and cosmetics, for example, which comprise two ingredients which may be stored separately for reasonably long periods of time, but which, after mixing, result in a product which may deteriorate rather rapidly. Such products usually comprise at least one liquid ingredient and one other ingredient which may be either a liquid ingredient or a dry ingredient in the form of granules or powder.

It is an object of the present invention to provide such a container which is simple to construct, easy to operate both as to filling with the separated ingredients and as to discharge of the mixed product, and which embodies certain safety features which protect against accidental, premature mixing of the separated ingredients, and against accidental discharge of the mixed product.

According to the present invention, the container comprises a bottle having a cylindrical neck on which a stopper and capsule assembly is mounted and is secured thereto by conventional means such as screw threads, or a bayonet joint, or by a "snap-on" interference fit. The said stopper comprises a tubular sleeve which extends downwardly through the bottle neck and terminates in a transverse wall which closes the lower end of the sleeve. The tubular wall of the lower portion of the sleeve adjacent said transverse wall has a plurality of apertures extending therethrough.

A tubular capsule is slidably mounted within said tubular sleeve to move between upper and lower terminal positions. In the lower terminal position of said capsule, the lower portion of the tubular wall of the capsule closes and seals said apertures. Also, the tubular wall terminates in a circular rim which seats against the transverse wall of the sleeve to seal the lower end of the capsule. Thus, in the lower terminal position of the capsule, the contents of the capsule are effectively separated from the contents of the bottle. When the capsule is moved to its upper terminal position, however, the apertures in the sleeve are opened and the contents of the capsules are permitted to fall into the bottle. A closure cap is mounted on the upper end of the capsule and may be secured thereto in any suitable manner.

It is to be noted that even after the capsule has been moved to its upper terminal position, the container remains sealed. Therefore, it is possible to shake the container to insure thorough mixing of the ingredients without fear of accidental discharge of the mixed product.

In order to permit discharge of the contents when desired, the closure cap is provided with a frangible portion which may be broken to provide a discharge aperture in the cap. In the preferred embodiment, the cap comprises a disk having a rim which is secured to the upper end of the capsule, and the disk is provided with a centrally located dome which extends upwardly from said disk and is integrally connected thereto by a thin

circular frangible ring. When it is desired to discharge the contents, the ring may be broken either by twisting the dome or applying lateral pressure thereto, leaving a central aperture through which the contents of the container may be poured.

A preferred embodiment of the invention selected for purposes of illustration is shown in the accompanying drawings, in which,

FIG. 1 is an elevation of the stopper body of the container.

FIG. 2 is a vertical section through the container showing the capsule in its lower terminal position with the contents of the capsule separated from the contents of the bottle.

FIG. 3 is a similar view showing the capsule in its upper terminal position to allow the contents of the capsule to flow into and mix with the contents of the bottle.

FIG. 4 is a similar view showing the dome of the closure disk broken away from the disk to form an aperture through which the contents of the container may be poured.

FIG. 5 is an enlarged sectional view showing the frangible integral connection between the disk and the dome.

Referring to the drawings, the container comprises a bottle 1 and a stopper and capsule assembly designated generally by 2. The bottle has a tubular neck 3 and the assembly may be secured to the neck in any suitable manner as by interengaging screw threads 4 and 5 on the bottle and on the depending skirt 6 of the stopper, respectively.

The stopper comprises a tubular sleeve 7 which extends downwardly through said neck and terminates in a transverse wall 8 which closes the lower end of the sleeve. The lower portion of the sleeve adjacent said transverse wall is provided with a plurality of apertures 9.

The capsule comprises a tubular wall 11 which is slidably mounted within said sleeve to move between the lower and upper terminal positions as illustrated in FIGS. 2 and 3, respectively. In the lower terminal position of the capsule the lower portion 12 of the wall 11 closes and seals the apertures 9. The lower portion 12 terminates in a rim 13 which seats against the transverse wall 8 of the sleeve and seals the lower end of the capsule.

The movement of the capsule to its lower terminal position is limited by the seating of the rim 13 against the wall. The movement of the capsule to its upper terminal position is limited by engagement of the shoulder 14 of an enlarged portion 15 of the wall 11 with an opposed shoulder 16 of the stopper. The engagement of said shoulders to establish an upper terminal position of the capsule is important to prevent accidental or premature withdrawal of the capsule from the stopper.

The upper end of the capsule is closed and sealed by a closure cap 21 which may be mounted on and secured thereto in any suitable manner. In the embodiment illustrated, the upper end of the capsule wall 11 terminates in a flange 17 which projects outwardly from the wall. The cap 21 comprises a disk 22 having a depending flange 23 which terminates in a bead 24 which engages the under side of the flange 17 to provide a snap-on interference fit.

It is possible to simply remove the closure cap from the capsule when it is desired to discharge the contents of the container. It is preferable, however, to provide a

3

smaller aperture in order that the discharge of the contents may be better controlled. For this purpose, the disk 22 is provided with a frangible portion which when broken provides a discharge aperture of limited size. In the embodiment illustrated, the cap is provided with a dome 25 projecting upwardly therefrom which is integrally connected to the disk 22 by a thin circular frangible ring 26 which may be broken either by twisting the dome or by applying lateral pressure thereto.

The thickness of the frangible ring 26 may be designed to provide the desired degree of resistance to breaking. Preferably, it is so designed as to be broken relatively easily by an adult, but to resist breaking by small children.

The bottle 1 and the stopper and capsule assembly 2, including the closure cap 21 may be made of any suitable materials, but preferably of plastics such as polyethylene or polypropylene, for example.

In assembling the container for use, a measured quantity of one ingredient 27, here assumed to be a liquid, is placed in the bottle 1. Then, with the capsule in its lower terminal position within the sleeve, a measured quantity of a second ingredient 28, here assumed to be granular, is placed in the capsule. The closure cap 21 is then snapped onto the flange 17 to seal the capsule, after which the stopper and capsule assembly may be screwed down onto the neck of the bottle.

In using the container, the capsule is pulled upwardly from the position of FIG. 2 to the position of FIG. 3, thus opening the apertures 9 to allow the contents of the capsule to drop into the bottle. The container may then be shaken to mix the two ingredients thoroughly. Then the frangible portion of the cap is broken by manipulation of the dome to provide an aperture 29 through which the contents may be discharged.

What is claimed is:

1. A two-compartment container comprising a bottle having a cylindrical neck, a stopper and capsule assembly mounted on said neck, said stopper and neck having interengaging means to secure said stopper to said neck, said stopper having a tubular sleeve extending downwardly through said neck and terminating in a transverse wall which closes the lower end of said

4

sleeve, the lower portion of said sleeve adjacent said transverse wall having a plurality of apertures extending therethrough, said capsule comprising a tubular wall slidably mounted within said sleeve to move between upper and lower terminal positions, the lower portion of said tubular wall being adapted to close and seal apertures in the lower terminal position of said capsule and to open said apertures in the upper terminal position of said capsule, said tubular wall terminating in a rim which, in the lower terminal position of said capsule, seats against the transverse wall of said sleeve to seal the lower end of said capsule.

2. A two-compartment container as claimed in claim 1, including a closure cap mounted on the upper end of said capsule.

3. A two-compartment container as claimed in claim 2 in which said closure cap is provided with a frangible portion which when broken provides an aperture in said cap through which the contents of the container may be discharged.

4. A two-compartment container as claimed in claim 2 in which said closure cap comprises a disk having a rim which engages the upper end of said capsule, said disk having a dome extending upwardly therefrom which is integrally connected to said disk by a thin, circular frangible ring.

5. A stopper and capsule assembly adapted to be mounted on the neck of a bottle, said stopper comprising a tubular sleeve terminating in a transverse wall which closes the lower end of said sleeve, the lower portion of said sleeve adjacent said transverse wall having a plurality of apertures extending therethrough, said capsule comprising a tubular wall slidably mounted within said sleeve to move between upper and lower terminal positions, the lower portion of said tubular wall being adapted to close and seal said apertures in the lower terminal position of said capsule and to open said apertures in the upper terminal position of said capsule, said tubular wall terminating in a rim which, in the lower terminal position of said capsule, seats against the transverse wall of said sleeve to seal the lower end of said capsule.

* * * * *

45

50

55

60

65