

[54] **DEVICE FOR THE STORAGE, MIXING AND DISPENSING OF INGREDIENTS**

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[51] Int. Cl. **B67b 7/26**

[58] Field of Search **222/80, 83, 82; 206/47 A; 215/6**

[56] **References Cited**

UNITED STATES PATENTS

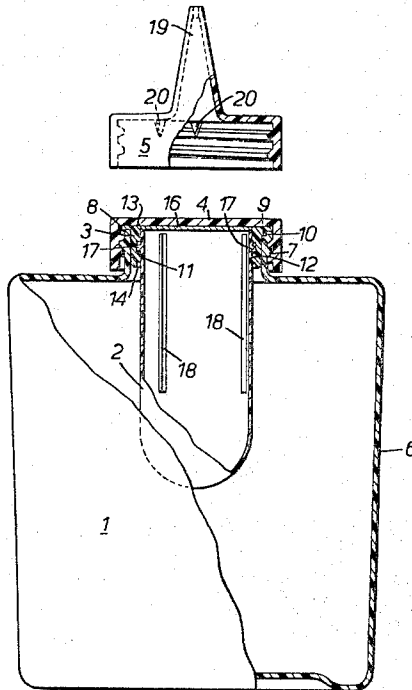
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[57] **ABSTRACT**

A device for the storage, mixing and dispensing of two ingredients which comprises two containers nested in spaced relationship one within the other, each container having a mouth, a collar within the mouth of the outer container, means for releasably supporting the inner container within the collar with the mouths of the two containers substantially coplanar, a rupturable closure extending across and sealingly engaging the mouth of the inner container, and means engageable with the device for rupturing the closure to open the mouth of the inner container and releasing the supporting means to permit the inner container to move within the outer container so that the contents of the two containers can be mixed by shaking the device.

6 Claims, 2 Drawing Figures



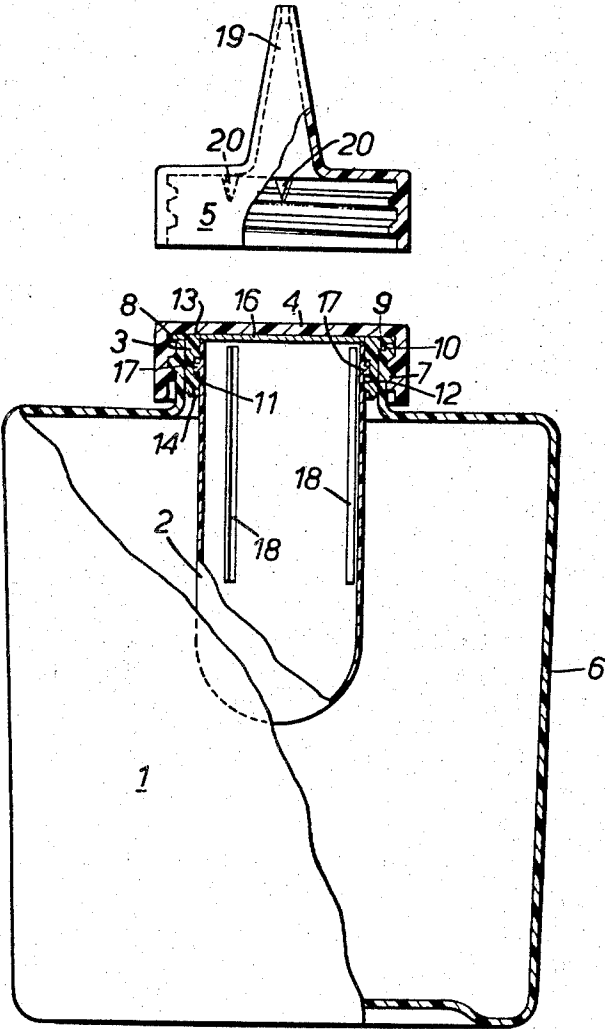


FIG. 1.

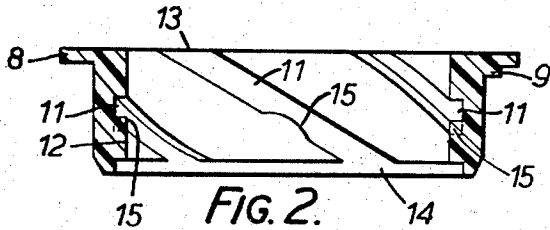


FIG. 2.

DEVICE FOR THE STORAGE, MIXING AND DISPENSING OF INGREDIENTS

This invention is concerned with an improved device for the storage, mixing and dispensing of ingredients.

In U. S. Pat. No. 3,402,855, assigned to the assignee of the present application, there is disclosed a device for storing, mixing and dispensing ingredients which comprises two containers, each having a mouth, nested in spaced relationship one within the other. The inner container is releasably supported with its mouth approximately coplanar with the mouth of the outer container, and a rupturable closure extends across the mouths of both containers in sealing engagement therewith. The disclosed device also includes means for rupturing the closure to open the mouths of both containers and for releasing the inner container to permit it to move within the outer container when the device is shaken to mix the contents of the two containers.

A principal object of the present invention is to provide an improved device which provides a more secure arrangement for holding the inner container within the mouth of the outer container. Other objects include providing a device in which only the mouth of the inner container need be sealed, thereby permitting the inner containers to be filled and easily handled before assembly into the outer container, and in which the possibility of the inner container accidentally dropping into the outer container during assembly, transit or storage is substantially eliminated.

The invention features a device for the storage, mixing and dispensing of ingredients which comprises two containers nested in spaced relationship one within the other, each container having a mouth, a collar within the mouth of the outer container, means for releasably supporting the inner container within the collar with the mouths of the two containers substantially coplanar, a rupturable closure extending across and sealingly engaging the mouth of the inner container, and means engageable with the device for rupturing the closure to open the mouth of the inner container and releasing the supporting means to permit the inner container to move within the outer container so that the contents of the two containers can be mixed by shaking the device.

Preferably the rupturable closure for the inner container is a membrane, and the outer container is provided with a protective closure cap, releasably engageable therewith, which can cover the membrane. The protective closure cap is interchangeable with the rupturing means which advantageously includes a spout for delivering the contents of the two containers.

In a preferred embodiment of the invention, in which the inner container is shorter than the outer container, the supporting means comprises a set of laterally projecting elements extending outwards from spaced locations on the inner container and a set of female screw threads, or grooves, traversing the inner surface of the collar. Each thread has one of the laterally projecting elements located therein and also includes a constriction which is adapted to form a friction fit with the projecting element so as to support the inner container in spaced relation above the bottom of the outer container. When force is applied during the rotation of one container with respect to the other, the elements move past the constrictions and out of the threads so per-

mitting the inner container to drop to the bottom of the outer container.

Advantageously, the outer container has an externally screw-threaded neck, the rupturing means is provided with downwardly projecting cutters and the inside of the inner container is provided with one or more laterally projecting elements. The cutters are adapted to rupture the rupturable closure extending across the mouth of the inner container when the rupturing means are first screwed on to the neck of the outer container and are adapted to engage the internal, laterally projecting elements of the inner container when further screwed on. This causes a relative rotation of one container with respect to the other and provides the force sufficient to cause the inner container to drop to the bottom of the outer container.

Other objects, features, and advantages will appear from the following detailed description of a preferred embodiment of the invention, taken together with the attached drawings in which:

FIG. 1 is a side view, partially in section, of a device constructed in accord with the present invention showing the protective closure cap in place on the outer container and the interchangeable rupturing means separate from and above the outer container; and,

FIG. 2 is an axial section of the collar of the device shown in FIG. 1.

Referring to these Figures, the device comprises an outer container 1, an inner container 2, a collar 3, a protective closure cap 4, and a rupturing means 5.

The outer container 1 has a generally cylindrical wall 6 and is provided with a threaded neck 7 at its open end. The collar 3 is a close liquid-tight fit in neck 7 and is located in position by an annular flange 8 which rests on the top of neck 7 and by a lug 9 which locates in a corresponding slot 10 in the mouth of neck 7. Collar 3 is provided with 4 female screw threads, or grooves 11 spaced equidistantly around its inner wall 12. Each groove 11 traverses the inner wall 12 from the top of the collar 13, nearest the annular flange 8, to the bottom of the collar at 14. Each groove 11 contains a constriction 15.

The inner container 2 is smaller than the outer container 1 so that it is capable of dropping through the neck 7 completely into the volume generally enclosed by the outer container wall 6. The contents of the inner container are enclosed therein by a laminated metal foil membrane 16 which seals the mouth of the inner container. Four lugs 17 are equispaced around the outer wall of the inner container 2 and are adapted to fit into the grooves 11 of collar 3 when the inner container 2 is located inside neck 7. The lugs 17 fit relatively loosely in the grooves 11, but the constrictions 15 form a friction fit with the lugs 17 and serve to hold the inner container 2 within the neck 7 of the outer container 1 until the lugs 17 are forced past the constrictions 15. The relative positions of lugs 17 and constrictions 15 are such that the foil membrane 16 is approximately coplanar with the mouth of the outer container 1. The inner container 2 is also provided on its inner wall with three equispaced inwardly projecting vertical ribs 18.

The outer and inner containers are secured in place for storage and transit by a protective closure cap 4 which screws on to the threads on neck 7. The ruptur-

ing means 5 is interchangeable with the closure cap 2 and is adapted to screw on to the threads on neck 7. The rupturing means 5 is provided with a spout 19 capable of dispensing the contents of the inner and outer containers and with three downwardly projecting cutters 20 equispaced on an imaginary circle centered on the principal axis of the rupturing means 5.

The operation of the device will now be described with reference to two reactive liquids which are desirably kept separate during transit and storage. The outer container 1 is filled with the requisite quantity of the first liquid and collar 3 is press-fitted into position. The inner container 2 is filled with the desired quantity of the second liquid and the mouth of the container is sealed with the laminated metal foil membrane 16. The inner container 2 is then assembled inside the outer container 1, the lugs 17 co-operating within the grooves 11 and passing downwards from the top of the collar 13 until they reach the constrictions 15. In the absence of force to make the lugs 17 pass through the constrictions 15, the inner container 2 is then substantially secured in position by screwing the protective closure cap 4 on to the threads on neck 7. The relative extent of movement between the inner and outer containers is regulated by the small amount of movement of lugs 17 in the grooves 11 above constrictions 15 and the engagement of the upper surface of the foil membrane 16 with the lower surface of the protective closure cap 4. The device is then suitable for transit and storage.

When it is desired to mix the contents of the two liquids, the closure cap 4 is removed and the rupturing means 5 screwed on to the threads on neck 7 in its place. As the rupturing means 5 is screwed down on the threads, the three cutters 20 cut through the metal foil membrane 16 close to the inner wall of the inner container 2, thus unsealing the liquid contained therein. As the rupturing means 5 is further screwed down, each cutter 20 then engages with a rib 18. Even further rotation of the rupturing means 5 with respect to the outer container 1 transmits sufficient force to the inner container 1 by means of the abutment of cutters 20 and ribs 18 to force the lugs 17 past the constrictions 15 and out of the grooves 11 so that the inner container 2 is free to fall to the bottom of the outer container 1. The rupturing means 5 may then be further screwed on to the outer container 1, the two liquids mixed by shaking and dispensed through the delivery spout 19.

While in the foregoing description we have described the outer container as being filled with the first liquid before the collar has been fitted in place, it may alternatively be filled with the liquid after the collar has been fitted in the neck of the outer container.

Alternatively to the procedure described above, the outer container may be filled with the liquid after the collar has been fitted in the neck of the outer container. Also, the inner container may be filled with the second liquid, sealed with the rupturable closure, and fitted to the collar before assembly to the outer container.

Embodiments other than that described above will occur to those skilled in the art and are within the scope of the following claims.

What is claimed is:

1. In a device for the storage, mixing and dispensing of ingredients which comprises two containers, each

having a mouth and nested in spaced relationship one within the other; means for releasably supporting the inner container within the outer container with its mouth substantially coplanar with the mouth of the outer container; a rupturable closure extending across and in sealing engagement with the mouth of the inner container; and means engageable with the device for rupturing the closure to open the mouth of the inner container and releasing the inner container to move within the outer container so that the contents of the two containers can be mixed by shaking the device, that improvement wherein:

said device includes a collar mounted within the mouth of the outer container, and means for releasably supporting the inner container within the collar comprising a projecting element fixed to one of said inner container and collar extending into an open ended groove fixed to the other of said container and collar, said groove having a constriction intermediate between its ends to restrain frictionally the movement of said projecting element through said groove, said projecting element being adapted to be forced past said constriction and through said groove by force applied to said rupturing and releasing means.

2. In a device for the storage, mixing and dispensing of ingredients which comprises two containers, each having a mouth and nested in spaced relationship one within the other, the inner container being shorter than the outer container; means for releasably supporting the inner container within the outer container with its mouth substantially coplanar with the mouth of the outer container; a rupturable closure extending across and in sealing engagement with the mouth of the inner container; and means engageable with the device for rupturing the closure to open the mouth of the inner container and releasing the inner container to move within the outer container so that the contents of the two containers can be mixed by shaking the device, that improvement wherein:

said device includes a collar mounted within the mouth of the outer container, and means for releasably supporting the inner container within the collar, comprising a set of elements projecting laterally from spaced locations on one of an outer surface of the inner container and the inner surface of the collar, and a set of female screw threads in the other of the outer surface of the inner container and the inner surface of the collar, each thread having one of the elements located therein and including a constriction adapted to form a friction fit with the one projecting element, the fit supporting the inner container in spaced relation above the bottom of the outer container, and the set of elements being movable past the restrictions in response to forcible rotation of one container with respect to the other to permit the inner container to drop to the bottom of the outer container.

3. The device of claim 2 wherein said set of elements extends outwards from the outer surface of the inner container and the set of female screw threads traverses the inner surface of the collar.

4. The device of claim 2 in which the inside of the inner container is provided with at least one laterally projecting element, and the rupturing means is pro-

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vided with at least one downwardly projecting cutter, the rupturing means being adapted for movement relative to the device in engagement therewith, and the cutter in response to the movement of the rupturing means being adapted to rupture the rupturable closure extending across the mouth of the inner container and to engage the laterally projecting element on the inside of the inner container for causing relative rotation of one container with respect to the other.

5. The device of claim 4 in which the rupturing means comprises a delivery spout for delivering the contents of the two containers, the outer container has a neck which is externally screw threaded, and the rupturing means is adapted for screwing on the neck whereby the rupturing means ruptures the rupturable closure when the rupturing means is first screwed onto the neck and causes the relative rotation when it is further screwed onto the neck.

6. In a device for the storage, mixing and dispensing of ingredients which comprises two containers, each having a mouth and nested in spaced relationship one

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within the other; means for releasably supporting the inner container within the outer container with its mouth substantially coplanar with the mouth of the outer container, a rupturable closure extending across and in sealing engagement with the mouth of the inner container; and means engageable with the device for rupturing the closure to open the mouth of the inner container and releasing the inner container to move within the outer container so that the contents of the two containers can be mixed by shaking the device, that improvement wherein:

the rupturable closure extends across the mouth and upper surface of the inner container only; and, the supporting means is frictionally releasable by force applied to said rupturing and releasing means and includes laterally projecting elements on one said container engaging with female screw threads associated with the other said container and said threads are provided with constrictions frictionally resisting passage of said elements.

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