

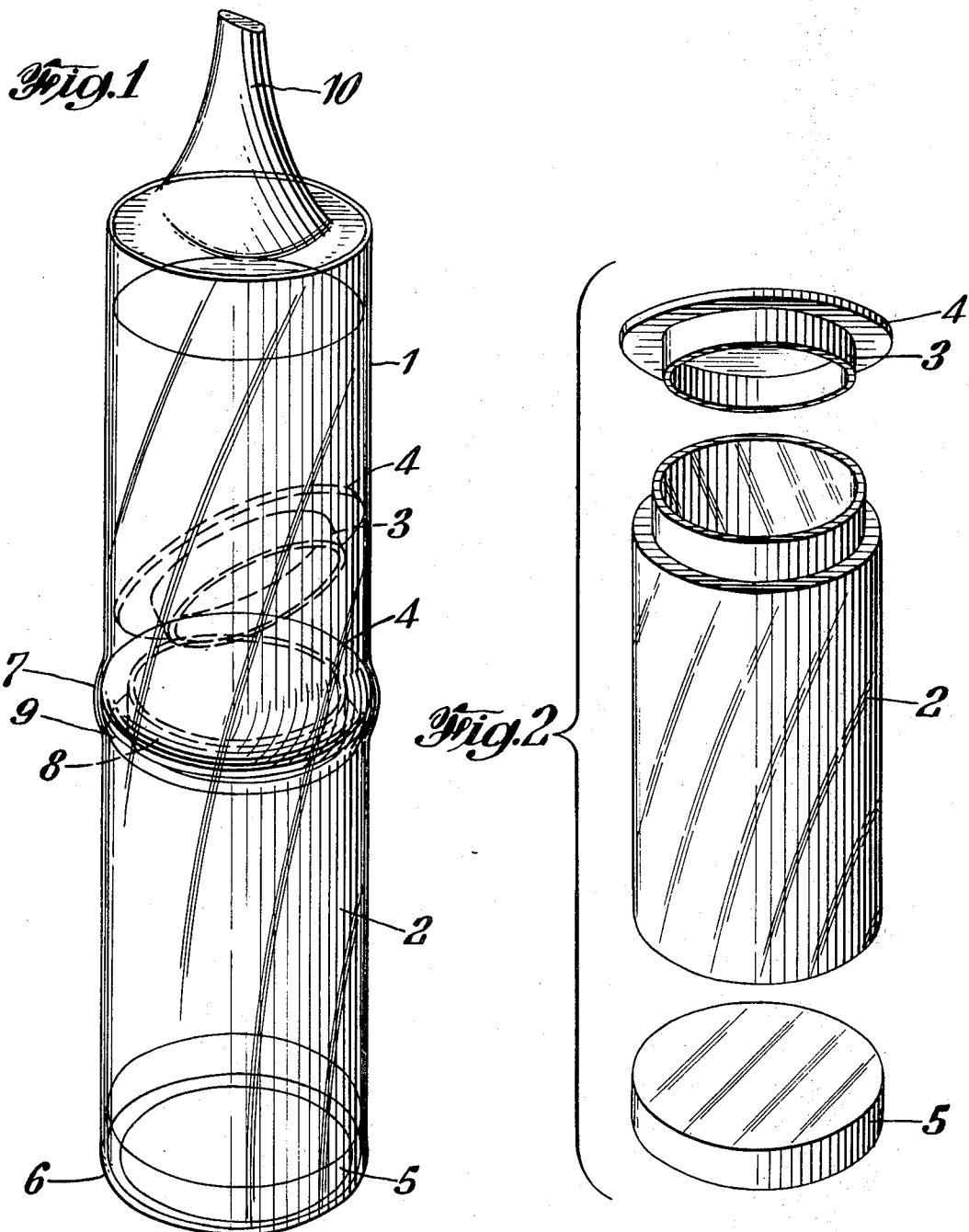
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DUAL COMPARTMENTED CONTAINER

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DUAL COMPARTMENTED CONTAINER
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7 Claims

ABSTRACT OF THE DISCLOSURE

This invention relates to a container for maintaining two fluids in a separated condition while providing means to mix the fluids at a desired time. The container comprises a plastic tube into which is sealed a glass vial. The vial is provided with a rigid flanged stopper which seals the vial and may be removed by exterior manipulation through the plastic tube to allow the fluids to mix.

This invention relates to a dual compartmented container having means to intermix the contents of each compartment.

There have been several attempts at producing a multi-chambered container for separately enclosing different fluids in such a way that they might be intermixed at a desired time without unsealing the overall container. The main problems which prior inventors have not overcome are interchamber leakage, premature removal of the barrier, and difficult manufacturing processes. Particular inventions relating to this concept are embodied in the reference Davies et al. (Pat. No. 3,290,017) and Nitardy (Pat. No. 2,176,923). It will be readily observable that these devices do not provide as effective a seal as does our invention nor do they employ a sealing means as secure against accidental dislocation as does the device here presented.

The main feature of this invention which overcomes the problems of the past is the concept of sealing a container within a container, the inner container being sealed by a flanged stopper. According to this invention a glass vial, sealed by a flanged stopper, is inserted into a flexible plastic tube and sealed therein. The flange of the stopper is constructed such that it engages the inside wall of the plastic tube in a pressed fit relation. In this manner an effective double seal is formed at the interface of the stopper and vial and also by the engagement of the flange and the plastic tube. This construction provides an extremely reliable seal with a minimum of opportunity for premature dislocation while being very simple in construction.

A device of this type may be used for many different purposes. One area in which this container is especially useful is the field of hair rinses. Here it is desired to keep the dye solution separate from a hydrogen peroxide solution until the rinse is about to be used. It is then desirable that the two solutions be quickly and thoroughly mixed. This invention provides an exceptional container for such a function. It allows for clean, quick and dependable mixing of the solutions for immediate use without cumbersome plungers or leaky plugs and mixing elements. Further advantages of this unique construction will become apparent from the more detailed description which follows. The accompanying drawings include:

FIG. 1 is a perspective view of the complete container showing the opened and closed position of the vial;

FIG. 2 is an exploded perspective view of the vial, stopper and base plug.

Referring specifically to the drawings this invention comprises a flexible outer cylinder 1 having top and bottom ends. A rigid, preferably glass vial 2 is inserted

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into the bottom of flexible cylinder 1 in a pressed fit relation. Vial 2 has a neck portion 8, into which fits a flanged stopper 3. The flanged stopper 3 seals the vial 2 and is in the sealed position during insertion of the vial into the cylinder. Flange 4 of stopper 3 has a diameter which is slightly larger than the outside diameter of the vial. It, therefore, engages the inner walls of cylinder 1 in a pressed fit. A seal is then formed by the engagement of stopper 3 and neck 8 and by the engagement of flange 4 and cylinder 1. An air seal 9 is also formed under flange 4.

In the preferred embodiment flexible cylinder 1 is provided with rigid base plug 5 which is inserted under the vial 2 into the cylinder 1. The outer cylinder is then heat sealed about the base plug at 6, thereby completely enclosing vial 2. The top portion of cylinder 1 is adapted to be opened allowing for removal of the mixture. In the preferred embodiment the cylinder 1 is molded at its top into an applicator nozzle 10, the tip of which is to be snipped off in order to open the container. The snip-off feature discourages reuse of the container which may be hazardous because of accumulated pressure caused by prolonged storage of the unused mixture, also a vent structure could be integrally molded into the nozzle to provide further safety. However, any similar method of sealing the top of cylinder 1 may be used.

In production the vial 2 is filled with fluid and sealed by the stopper 3. Then, it is inserted into the outer cylinder 1 followed by the rigid plug 5. The bottom of the plastic cylinder 1 is then heat sealed about the base plug 5. The second fluid is then placed in the upper part of the plastic cylinder after which the top of the cylinder is molded into an appropriate snip-off applicator nozzle 10.

Flanged stopper 4 may be constructed having a conventional aluminum sealing ring to engage the neck portion 8. The height of neck portion 8 should provide sufficient room so that the stopper may be easily dislodged with a force exerted upwardly by user's finger tips. The height of the neck also allows room for an air pocket.

The base plug 5 in addition to providing a convenient element about which to seal the container also protects the bottom of glass vial 2.

It is seen that the stopper 3 cannot easily be accidentally dislodged from its sealed position. However, it may be desirable to provide a package for the container which would be designed to further prevent such accidental dislodging of the stopper.

The particular details of the device may be varied or modified without departing from the scope of the following claims.

We claim:

1. A dual compartmented container having means for intermixing the contents of the compartments, said container comprising:

(A) a flexible outer cylinder;

(B) a rigid vial sealed within the outer cylinder and having a reduced neck portion; and

(C) a flanged stopper which fits into the reduced neck portion in a sealed relation, the flange of said stopper engaging the inner wall of the flexible cylinder in a sealed relation, thereby dividing the container into two compartments, said stopper being adapted so that it may be removed from the neck portion by exterior manipulation through the flexible cylinder.

2. A dual compartmented container according to claim 1 wherein the outer flexible cylinder comprises:

(A) a flexible plastic tube;

(B) a rigid base plug inserted in one end of the plastic tube; and

(C) a plastic applicator nozzle integrally molded into the other end of the plastic tube, said container being

adapted to be opened by snipping of the tip of said nozzle.

3. A dual compartmented container according to claim 2 wherein the end of the plastic tube is sealed around the base plug by the application of heat.

4. A dual compartmented container according to claim 1 wherein the rigid vial is constructed of glass and has dimensions such that it can be inserted into the outer cylinder in a pressed fit relation.

5 5. A dual compartmented container according to claim 4 wherein the stopper is constructed of a semi-rigid plastic and has a diameter which is slightly greater than the diameter of the vial.

10 6. A dual compartmented container according to claim 1 wherein the vial is sealed by an aluminum coating at the interface of the stopper and the neck portion.

15 7. A dual compartmented container having means for intermixing the contents of the compartments, said container comprising:

(A) a flexible plastic tube having a rigid base plug inserted in one end, said tube being heat sealed about the base plug and having a plastic applicator nozzle integrally molded into the other end, the container being adapted to be opened by snipping off the tip of said nozzle;

20 (B) a glass vial inserted into the plastic tube in a pressed fit relation and sealed therein, said vial having a reduced neck portion; and

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(C) a semi-rigid, plastic, flanged stopper having a diameter slightly larger than the diameter of the vial, said stopper fitting into the reduced neck portion of the vial in a sealed relation and being additionally sealed by an aluminum coating at the interface of the stopper and vial, the flange of said stopper engaging the inner wall of the flexible plastic tube in a sealed relation thereby dividing the container into two compartments, said stopper being adapted to be removed from the neck portion of the vial by exterior manipulation through the flexible plastic tube, thereby allowing the contents of each compartment to be intermixed.

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