

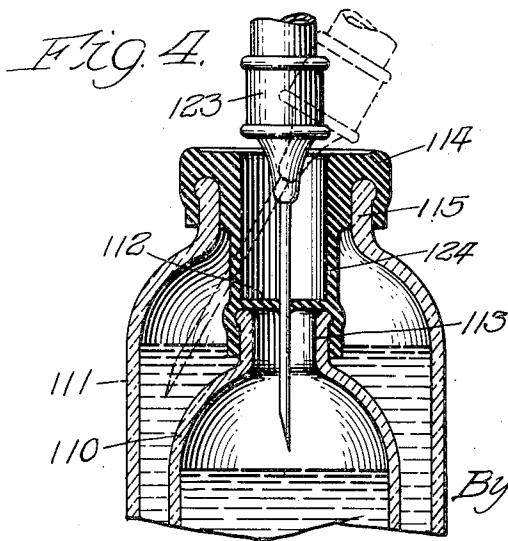
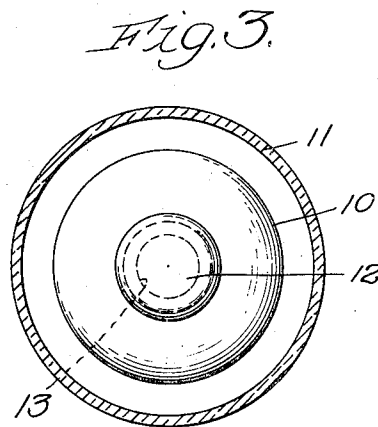
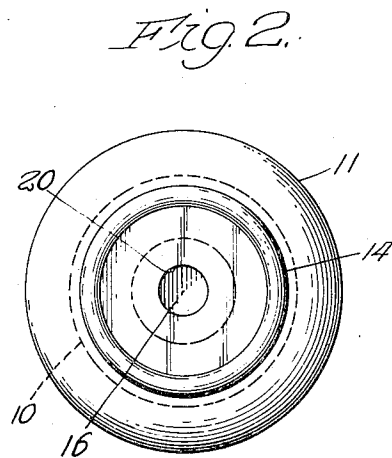
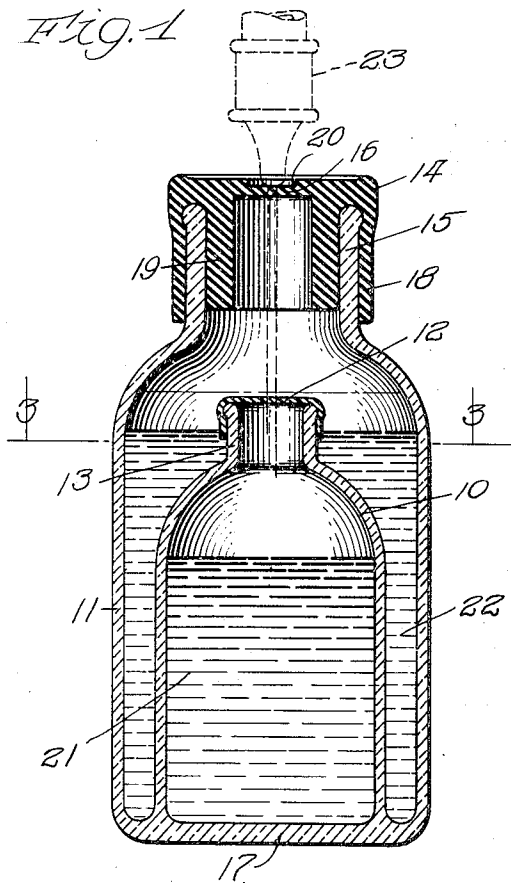
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2,494,456

CONTAINER

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UNITED STATES PATENT OFFICE

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CONTAINER

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6 Claims. (Cl. 128-272)

1

This invention relates to a container and more particularly to a multi-compartmented container primarily intended for sterile pharmaceutical or medicinal products.

Certain pharmaceuticals consist of materials which are stable indefinitely or for a reasonable length of time, but which when in solution become unstable and deteriorate; for example, penicillin, many of the arsenicals, certain hormones, and other labile materials. At the present time it is the practice to package the solid and the sterile solvents separately, making it necessary to withdraw the contents of one bottle and inject it into another bottle, the operation necessitating some portion of the manipulation to occur in a non-sterile environment. The resulting operation is time consuming, rather laborious and potentially dangerous since contamination somewhere in the manipulation is an ever present hazard.

In other operations, it may likewise be desirable to mix two liquids at the time of use and not before.

The present device permits the solution of a solid in a solvent without any contact with the outside air, or the mixing of two solutions in the same manner. This is made possible by providing a multi-chambered container comprising two transparent flasks, preferably of glass, one inside the other, with each having a substantially axial opening in one end thereof, preferably the top, the open ends being contiguous so that a hypodermic needle can be passed through both at one time, and then sealing these openings with diaphragms of well-known form. When the container is designed to hold more than one dose so that a part only of the contents will be withdrawn from time to time the outside diaphragm, at least, should be self-sealing so as to keep out air and other materials. When the container is designed to hold only a single dose none of the diaphragms need be self-sealing unless desired. A hypodermic needle may be passed through both diaphragms to the inner container or flask, the proper amount of material drawn into it and then the needle withdrawn into the chamber of the outer flask for addition of the interior material to the solution or solid. Obviously, the roles of the two flasks may be reversed, since the needle may be first filled from the outer container and then the contents ejected into the internal container.

The invention will be described as related to the embodiments shown in the accompanying drawings. Of the drawings Fig. 1 is a vertical

2

section taken substantially through the center of a container embodying the invention; Fig. 2 is a plan view of the container of Fig. 1; Fig. 3 is a horizontal section taken along line 3-3 of Fig. 1; and Fig. 4 is a fragmentary vertical section taken substantially through the center of a container showing a second embodiment of the invention.

The container of Figs. 1 to 3 comprises a central flask 10, an outer, larger flask 11, a self-sealing puncturable diaphragm 12 closing off the mouth 13 of the inner flask 10, and a stopper 14 over the mouth 15 of the outer flask 11. The stopper 14 includes a second self-sealing puncturable diaphragm 16. The two flasks 10 and 11 have a common bottom 17, and the two flasks are substantially coaxial with the mouths 13 and 15 also coaxial and at corresponding ends of the flasks.

The stopper 14 has a depending portion 18 on the outside of the mouth 15 and a second depending portion 19 on the inside of the mouth 15. The diaphragm 16 extends across the top of the stopper and has a depressed section 20 at substantially the center to reduce the thickness of the diaphragm at this point.

The interior 21 of the inner flask 10 may contain a liquid or a solid, while the space 22 between the inner flask 10 and the outer flask 11 may be filled with a solid or a liquid. When the container is in use at least one of the spaces 21 and 22 must contain a liquid.

When the container holds two liquids as shown, a hypodermic needle 23 may be inserted through the diaphragm 16 and through the diaphragm 12. Some of the liquid may be withdrawn from the central flask 10 into the needle 23 and then ejected into the liquid in the space 22 between the two flasks. Here complete mixing may be obtained by shaking the container, and the resulting solution may then be drawn into the needle 23. This is only one way of using the container, as the roles of the two flasks may be reversed if desired. Also one flask may contain liquid while the other one contains solid. Then the liquid would be drawn into the needle, injected into the compartment containing the solid, the two materials mixed, and the resulting solution or dispersion drawn into the needle.

The embodiment shown in Fig. 4 is similar to that just described, but requires a different type closure for the two flasks. In this second embodiment the stopper 114 is open at the top but has a depending portion 124 extending down from inside the mouth 115 of the outer flask to cover

3

the outer surface of the mouth 113 of the inner flask. At the bottom of the depending portion 124 there is located a diaphragm 112 closing off the mouth of the inner flask.

In this second embodiment of the invention the needle 123 is inserted into the two flasks in substantially the same manner as described above. However, in this case the needle must be inserted through the depending portion 124 of the stopper 114.

The diaphragms 12, 16, 112, and 124 may be made of any inert puncturable material and may or may not be self-sealing. These materials are well-known in the art.

Having described my invention as related to the embodiments set out in the accompanying drawings, it is my intention that the invention be not limited by the details of description unless otherwise specified, but rather be construed broadly within its spirit and scope as set out in the accompanying claims.

I claim:

1. A container comprising at least two transparent flasks with one inside the other, openings at corresponding ends of the flasks with the openings being spaced from each other, and puncturable diaphragms fixed in position and closing each opening, with the openings being axially aligned, and the flasks are provided with a bottom common to both.

2. A container comprising two transparent flasks one inside the other and coaxially aligned, axial openings at corresponding ends of the flasks with the openings being spaced from each other, and puncturable diaphragms fixed in position and closing each opening, with the two flasks having a single bottom common to both.

3. The container of claim 2 wherein the sides of the two flasks are spaced from each other.

4. A container comprising a transparent flask having a neck portion and an opening, a second transparent flask of smaller diameter within the first flask also having a neck portion and an

4

opening, said flasks having a common bottom to provide an integral structure with the openings being at corresponding ends of the flasks and spaced from each other, and self-sealing puncturable diaphragms fixed in position and closing each opening.

5. A container comprising a transparent flask having a neck portion and an opening, a second transparent flask of smaller diameter within the first flask also having a neck portion and an opening, said two flasks being joined together to make an integral structure, a puncturable diaphragm fixed in position and closing the opening of the inner bottle, and a puncturable well connecting the neck portions of the two bottles.

6. A container comprising an outer flask having an opening therein, at least one inner flask within the outer flask also having an opening, said flasks being joined together to make an integral structure and said openings being on corresponding ends of the flasks, and a puncturable diaphragm normally closing off each opening, said diaphragms being fixed in position.

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