

April 18, 1967

G. A. MOUNIER

3,314,563

PLURAL-COMPARTMENT CONTAINER

Filed Nov. 14, 1963

FIG. 1

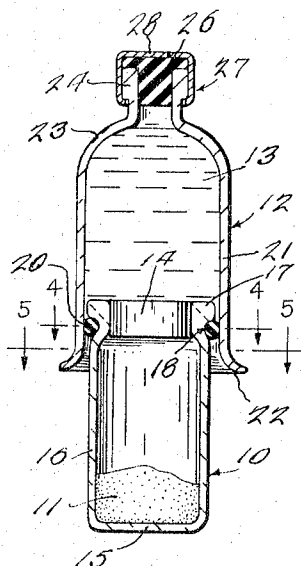


FIG. 2

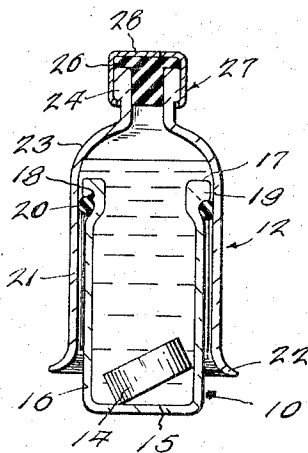


FIG. 4

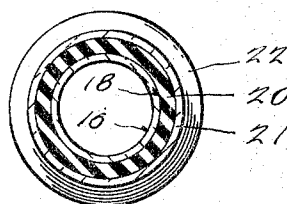


FIG. 5

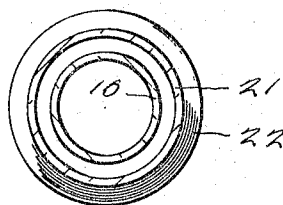
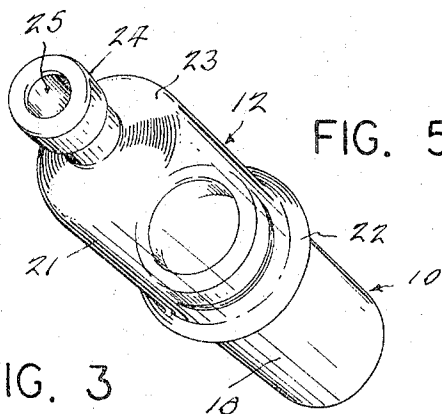


FIG. 3



INVENTOR.
G.A. MOUNIER
BY
Ej. Hollen &
H.A. Schaich
ATTORNEYS

1

3,314,563

PLURAL-COMPARTMENT CONTAINER

George A. Mounier, Toledo, Ohio, assignor to Owens-Illinois, Inc., a corporation of Ohio
Filed Nov. 14, 1963, Ser. No. 323,799
4 Claims. (Cl. 215-6)

My invention is a plural-compartment container, or vial, for use in the packaging of parenterals.

An important object of my invention is the provision of a plural-compartment container wherein each of two compartments or chambers involved, is an individually formed vessel and wherein the vessels are in part telescoped one within the other while packaging a soluble medicament in one such vessel and a diluent in the other, there being a stopper-like partition between the compartments which is displaced by hydrostatic pressure resulting from substantially complete telescoping of the vessels.

A further object of my invention is the provision of a novel, relatively inexpensive plural-compartment container which can be created by assembling glass vessels differing only in comparatively minor details from other conventional containers or vials, such as are produced from glass tubing at very high speed and low cost.

It is also an object of my invention to provide a plural-compartment container of the above character wherein the vessel containing the medicament is closed by a stopper and the diluent-containing vessel sealingly telescopes over the stoppered end of the other vessel so that incident to substantially complete telescoping of the two vessels, pressures of the diluent will displace the stopper and allow admixing of the diluent and medicament preparatory to removal by a hypodermic syringe, for example.

Other objects will be in part apparent and in part pointed out hereinafter.

In the accompanying drawings forming a part of my application:

FIG. 1 is a vertical longitudinal sectional view of a plural-compartment container embodying my invention.

FIG. 2 is a view like FIG. 1, but with the vessels completely telescoped and the final solution ready for hypodermic syringe withdrawal.

FIG. 3 is a perspective view of the container.

FIG. 4 is a sectional view taken along the plane of line 4-4 of FIG. 1.

FIG. 5 is a sectional view taken along the plane of line 5-5 of FIG. 1.

In accordance with the illustrated embodiment of my invention it comprises two vessels which may well be formed from lengths of glass tubing, following generally the conventional fabricating practice involved in the production of vials, with some minor departures as the specific detail structures require. Such practice involves tube severance, bottoming, necking and neck-tooling, these being steps utilized in conventional high-speed production of low-cost vials, or bottles. The design of the present invention is such that it utilizes the above procedure in large part and as a consequence, my container is in fact a low-cost article.

In this container there are two separate axially aligned vessels or vials including a vial-like vessel 10 containing a measured amount of a medicament 11 and an upper bottomless vessel 12 containing the diluent 13 or solvent and having its open end telescoped a short distance over an end of the medicament containing vial-like vessel. A stopper 14 prevents premature admixing of the diluent and medicament.

The vial-like lower vessel 10 comprises a bottom 15 and an upstanding sidewall 16 terminating at its upper end in an annular neck 17. Internally, this neck portion has a straight circular sealing surface to accommodate

2

the stopper 14, or gate, which is formed of any suitable elastic material. Externally the neck 17 has an annular channel 18 just below the radial lip 19 to receive an O sealing ring 20 which projects radially outward beyond the side of the vessel body or sidewall 16 for hermetic sealing, yet has slidable engagement with the interior surface of the aforementioned bottomless upper vessel 12 which initially contains only the diluent 13, or solvent.

This upper vessel 12 comprises an elongated cylinder-like body 21 of slightly greater internal diameter than the external diameter of the neck and body of the lower vessel to permit telescoping, as illustrated. Preferably the wall of the body 21 is flared to produce a guiding lip 22 at the open lower end, facilitating entry of the lower vessel into said body 21. The upper end of this body 21 is closed by an end wall 23 of any preferred contour, there being a reduced neck 24 rising centrally from said wall 23 and defining a filling opening 25. A needle penetrable stopper 26 formed of an elastic material closes this neck opening 25 and may be held in place by an aluminum seal closure 27 in customary fashion. This seal closure 27 embodies the conventional pull tear strip 28 which is displaced manually to permit insertion of a hypodermic syringe needle (not shown) as is the usual practice.

Normally, the vessels and gate, with the medicament and diluent are assembled about as shown in FIG. 1 so that there is no premature intermixing of the medicament and diluent. Preparatory to use, the two vessels are bodily moved axially relative to one another bringing them to about the positions indicated in FIG. 2. Such relative movement displaces the gate or stopper 14. Shaking the container thoroughly intermixes the medicament and diluent, whereupon the tear strip 28 is pulled aside and the hypodermic needle pushed through the stopper in this upper vessel and in customary fashion the syringe is loaded.

It is apparent from the above that I have designed a plural-compartment container which is far more practical and less costly than those previously available and which involve most unorthodox and complex shapes of tubes and bodies. My invention, as explained heretofore, basically utilizes two properly dimensioned vials of nearly conventional form with the exception that one is bottomless and the other is provided with a sealing ring or rings, as needed. In some situations two such rings may prove desirable in order to maintain the two vessels against "cocking" and consequent binding. Alternatively, a sealing ring of different cross-sectional shape than that shown may well reduce or eliminate such cocking.

Modifications may be resorted to within the spirit and scope of the appended claims.

I claim:

1. In a plural-compartment container for retaining segregated contents prior to intermixing, a first rigid vial having a closed bottom portion at one end and a neck defining an open mouth portion at the other end, a second rigid vial having a mouth portion at its upper end and a fully-open bottom portion at its lower end adapted to permit slidable telescoping movement of said first vial within said second vial in coaxially-aligned relation, sealing means closing the open mouth portion of said second vial, a sealing ring mounted on the neck of said first vial in slidable sealing contact with the interior surface of said second vial, and displaceable sealing means mounted in the mouth portion of said first vial adapted to displacement upon telescoping movement of the said two vials.

2. In a container as defined in claim 1, the sealing ring fixedly mounted on the neck of said first vial consisting of elastomeric material adapted to slidable pressure-tight contact with the interior surface of said second vial.

3

3. In a container as defined in claim 1, the neck of said open mouth portion of said first vial having an external annular channel with said sealing ring disposed in said channel, the displaceable sealing means disposed within the mouth portion of said first vial consisting of an elastomeric stopper member.

4. In a container as defined in claim 1, wherein both said vials consist of tubular glass bodies having closely complementary interior and exterior surfaces to facilitate telescopic engagement, and said sealing means closing the mouth portion of said second vial comprises a needle-penetrable stopper of elastomeric material.

4

References Cited by the Examiner

UNITED STATES PATENTS

2,449,968	9/1948	Smith	128—272
2,636,493	4/1953	Lockhart	128—272 X

FOREIGN PATENTS

640,037	5/1955	France.
---------	--------	---------

THERON E. CONDON, *Primary Examiner*.MARTHA L. RICE, *Examiner*.