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BOTTLE STOPPER

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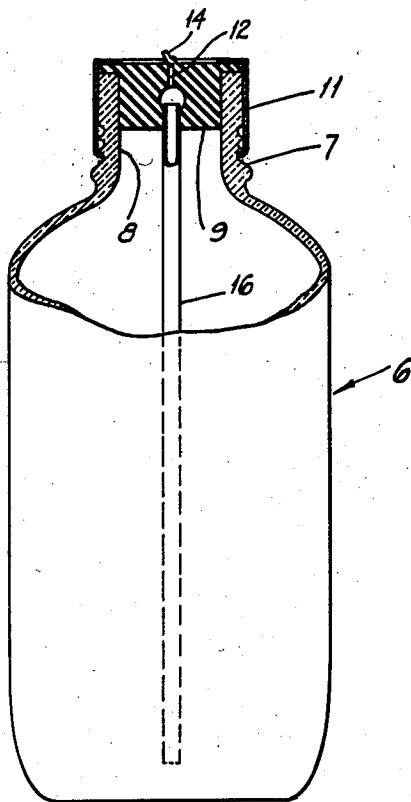


Fig. 1

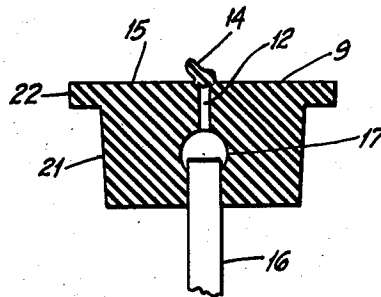


Fig. 2

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BOTTLE STOPPER

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2 Claims. (Cl. 128—272)

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This invention relates to an improvement in a container for a solution for a parenteral injection and particularly to a stopper construction for such a container.

The usual container for such sterile solutions includes a glass bottle having a neck closed by a resilient stopper compressed in the bottle neck. In use, the stopper is pierced with a suitable tubular element to permit withdrawal of its contents, the bottle then being inverted and the contents withdrawn; it is usual in assembling the container to provide a glass tube within the bottle which extends from the stopper to adjacent the other end of the bottle to admit air. The passage in which the tube is mounted in the stopper is ordinarily closed by a suitable, removable seal element.

To ensure that the glass tube remains in place at all times, it has been necessary heretofore to provide a special locking means at the end of the tube which complicates the construction and renders the parts more expensive and their assembly difficult; if a straight length of tubing is used without such special retaining means, the forces inherently present in the compressed stopper suffice to cause the tube in some instances to be displaced from its mounting in the stopper.

In accordance with this invention, I provide a stopper construction which, in combination with a plain length of tubing, suffices to retain the tubing in place.

It is in general the broad object of the present invention to provide an improved container construction and particularly an inexpensive, improved seal enabling the air admittance tube to be mounted in a very simple and yet positive manner.

The invention includes other objects and features of advantage, some of which, together with the foregoing, will appear hereinafter wherein the present preferred form of container and stopper embodying this invention are disclosed.

In the drawing accompanying and forming a part hereof, Figure 1 is a side elevation partly in section through a container embodying my invention.

Figure 2 is an enlarged sectional view through a stopper illustrating the construction employed for mounting the air admittance tube.

Referring to the drawing, I have shown a glass bottle container generally indicated at 6 and having a reduced neck portion 7, the latter having an internal cylindrical surface 8 defining an outlet from the bottle. A resilient stopper, gen-

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erally indicated at 9, is mounted in the bore 8 and is retained in place as by the usual metal cap 11.

The resilient stopper 9 includes an air passageway 12 closed by a suitable removable seal element such as removable closure 14 provided upon the outer face 15 of the stopper. Stopper 9 also includes a plug portion having side walls 21, which in the form disclosed is a truncated frustum of a cone terminating in a cylindrical flange 22 which is held firmly against the top of the bottle, as appears in Figure 1, and seals the container; one can use a stopper having a cylindrical side wall. The overall size of the stopper to be inserted in the bottle is, in any case, such that the stopper is compressed at least slightly and a fluid-tight closure provided.

A length of tubing 16 is mounted in a portion of the air passage 12 and, in accordance with this invention, the passage 12 is provided with an enlargement or cavity 17 intermediate the ends of the passage, a terminal end of tube 16 extending into such enlargement so that the end of the tube is exposed and axial forces cannot be applied to such end by the resilient stopper. As is shown in the drawing, the portion of the passageway extending from the cavity to the atmosphere is of substantially smaller diameter than the diameter of the tube. The enlargement or cavity can take various forms and that which has been shown in the drawing is spherical. However, it can be cylindrical or of an irregular shape so long as it is relatively large as compared to the tube diameter. The function of the cavity is to take up certain compressive forces in the stopper so that all forces applied to the tube 16 are in a direction normal to the longitudinal axis of the tube while any force extending in a direction parallel to such axis is not applied to the tube. With such axial forces eliminated, the tube remains securely in place at all times.

From the foregoing, I believe it will be apparent that I have provided a relatively novel, simple and improved container and stopper construction. It will be obvious to those skilled in the art that the chamber 17 provided adjacent to the end of the glass tube 16 can take various forms and I do not wish to be limited to any particular form within the scope of the appended claims.

I claim:

1. In a parenteral injection container having a resilient stopper mounted in the container neck with an air tube mounted in an air passageway

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in the stopper and extending to adjacent the bottle end, the improvement consisting in walls defining a cavity in the air-passageway in the stopper into which the tube projects with its terminal end in the stopper out of contact with the stopper, the portion of said passageway extending from the cavity to the atmosphere being of substantially smaller diameter than the tube.

2. A stopper for a parenteral injection container having a resilient plug portion adapted to fit within the neck of said container by compressive friction grip, said stopper having a tube mounted in an air passageway therein said tube extending from that side of the stopper adapted to fit within the container, and walls defining a cavity in the air passageway in said stopper

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into which the tube projects with its terminal end in the stopper out of contact with the stopper, the portion of said passageway extending from the container to the atmosphere side of the stopper being of substantially smaller diameter than the tube.

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