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I. W. DAFFER
REVERSIBLE STOPPER
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2,447,166

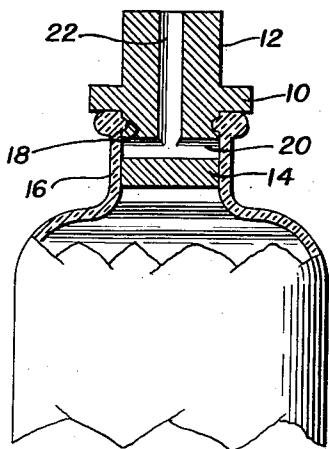


Fig. 1.

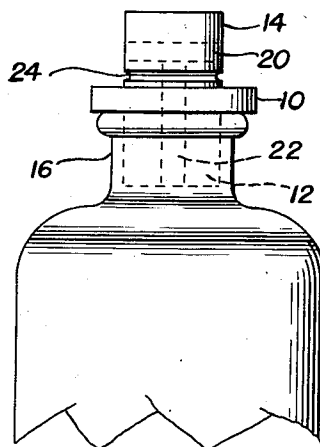


Fig. 2.

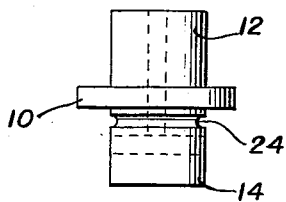


Fig. 4.

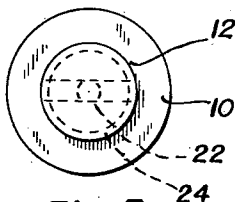


Fig. 3.

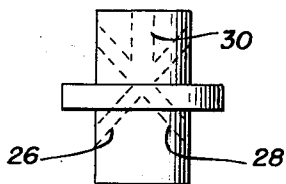


Fig. 5.

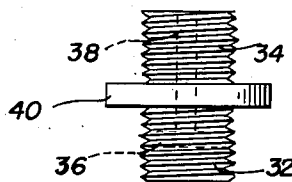


Fig. 6.

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REVERSIBLE STOPPER

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1 Claim. (Cl. 215—73)

1

This invention relates to reversible stoppers and more particularly to a stopper the ends of which may be selectively inserted in a vent or neck in a container, the insertion of one end of the stopper effectively sealing the container, while insertion of the other end of the stopper allows the contents of the container to be vented at a predetermined rate.

Since reversible stoppers of various types have been known and used for many years, this application is not drawn to the basic structure of such stoppers, but rather to improvements and refinements in the construction thereof and the combination of a specially designed stopper with a specially designed vent or neck in the container.

An object of this invention is, therefore, to simplify the construction of such stoppers without detracting from the efficiency of the same.

Another object of this invention is to provide means incorporated in this stopper and in the vent which is proposed to be closed to retain the stopper more tightly in said vent, this feature being especially valuable in this type of stopper since it has been found that this type of stopper being removed many times in use is apt to become loosely held in the vent. Whereas these stoppers are likely to be used with containers which are shaken to expel the contents thereof, it is of prime importance that the stoppers remain tightly held.

Another object of this invention is to provide a simple annular flange more or less midway of the length of the stopper, to properly position the stopper in the vent when the ends of the stopper are selectably inserted in such vent.

And a last object to be specifically mentioned is to provide a stopper of this class which can be manufactured in any one of various forms, all of which are modifications within the scope of this application.

With these and other objects in view as will appear hereinafter, this invention consists of certain novel features of construction, combination and arrangement of parts, as will be hereinafter described in detail and particularly set forth in the appended claim, reference being had to the accompanying drawings which form a material part of this application, and in which:

Figure 1 is a view of this reversible stopper, shown inserted so as to seal the neck of a bottle, the figure being largely in section with a fragmentary portion of the body of the bottle being shown in elevation;

Figure 2 is an elevational view of the same structure but with the stopper shown in reversed

2

position so as to allow the venting of the contents of the bottle;

Figure 3 is a top plan view of the stopper;

Figure 4 is a side elevational view of the stopper;

Figure 5 is a side elevational view of a modification of the stopper; and

Figure 6 is a side elevational view of a second modification of this stopper.

Similar characters of reference refer to similar or identical parts throughout the several views of the drawings.

As shown in the drawings this stopper comprises a cylinder of any suitable material provided approximately midway of its length with an annular flange 10, the ends of the cylinder 12 and 14 being selectively insertable into the vent of a container which is illustrated in the drawings as comprising the bottle neck 16. This vent or neck 16 is specially designed for use with this stopper and is provided with an internal annular flange, ridge or other undulation, illustrated in Figure 1 at 18. It is of course understood that this illustration is purely exemplary in character and any type of undulation, suitable to be incorporated with both the vent and stopper having consideration to the character of the material of which these types are comprised, may be used.

A channel 20 transversely disposed of the cylindrical end portion 14, may be made with both ends of the channel open as shown in Figure 1, and a longitudinally disposed channel 22 is provided extending from the end of the stopper remote from the channel 20 substantially longitudinally of the stopper to communicate with said channel 20.

The positional arrangement of the above mentioned parts will determine, in large measure, the preferred position of the undulation of the stopper adapted to register and coact with the undulation 18 on the vent of the container. In the particular embodiment of this invention illustrated in the drawings, however, a simple annular recess 24 may be provided between the end of the channel 20 and the annular flange 10, it being understood that a plurality of such annular recesses, or other types of undulation might be preferred for certain uses.

A modification of this invention is shown in Figure 5, two obliquely transverse channels 26 and 28 communicating with a single channel 30 disposed longitudinally, thus providing for a plurality of outlets and facilitating ejection of the contents of the container in spray form.

Another modification of this invention is il-

illustrated in Figure 6, in which the two cylindrical end portions 32 and 34 are screw threaded for application to certain types of vents in containers, and it will be noted that in this modification the annular recess 24 incorporated with the stopper as illustrated in Figure 1 is deleted, since the threads will adequately retain the stopper in position without the assistance of the special device described above. A transverse channel 36 and a longitudinal communicating channel 38, and a collar 40, corresponding to the channels and flange hereinbefore described, may be provided in this modification.

Having consideration to the above description of the structural features of this invention, the method of operation thereof will be obvious, but in recapitulation it may be noted that, when it is desired to close the vent, the end portion 14 of the stopper is inserted into the vent so that the vent structure, in this case the bottle neck 18, will effectively close the ends of the channel 20. When the stopper is in this position the annular recess 24 of the stopper will be in engagement with the annular ridge 18 in the bottle neck, making it difficult for the stopper to be removed accidentally. When it is desired to use a portion of the contents of the container, the stopper is removed and the end portion 12 is placed in the vent of the container, with channel 22 now communicating with the interior of the container and the ends of the channel 20 being open. In using the modified form of this invention, a procedure approximately analogous to that described above is used.

Though there has been shown a particular embodiment of this invention and certain modifications thereof, this application is not limited to this particular embodiment and modification, but it is desired to include in the scope of this in-

vention the construction, combination and arrangement of parts substantially as set forth in the appended claim.

Having thus described this invention, what is claimed as new and desired to be secured by Letters Patent is:

A reversible stopper having a transverse channel therethrough and a substantially longitudinal channel extending from one end of the stopper to said transverse channel, the ends of the stopper being selectively insertable in a neck of the container, said transverse channel being unequally spaced from the ends of the stopper, an annular flange midway of the length of the stopper, said transverse channel being in a portion of the stopper on that side of the flange remote from said one end, and said transverse channel being adapted to be closed at both ends thereof when said portion is operatively inserted in the neck of a container.

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