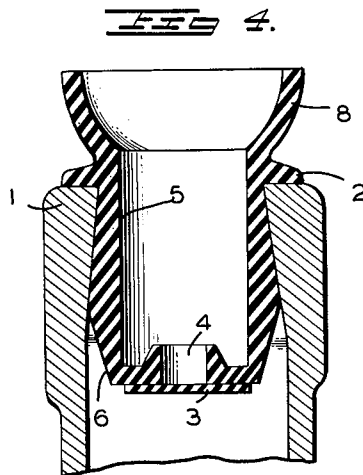
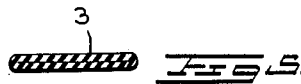
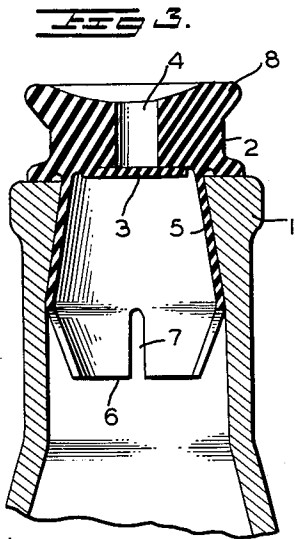
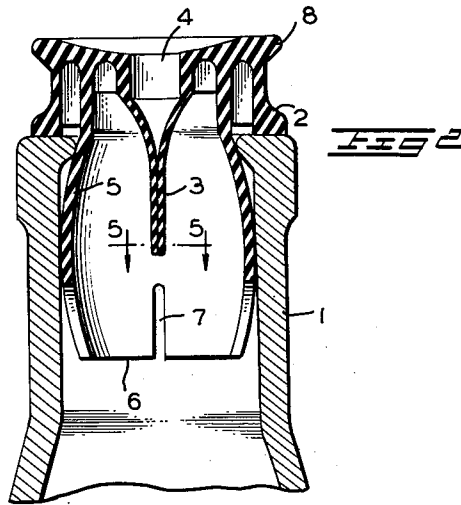
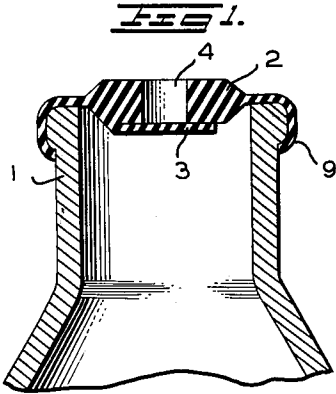


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STOPPERS FOR VESSELS, ESPECIALLY FOR BOTTLES  
WITH GASEOUS OR SPARKLING LIQUIDS  
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**STOPPERS FOR VESSELS, ESPECIALLY FOR BOTTLES WITH GASEOUS OR SPARKLING LIQUIDS**

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5 Claims. (Cl. 215-74)

This invention relates to an improved stopper for bottles containing carbonated liquid wherein the bottle may be filled or emptied while the stopper is on the bottle and means is provided on the stopper to prevent the escape of gas from the liquid within the bottle.

The main defect of stoppers used in the past for bottles having carbonated liquid contained therein is that a considerable part of the gas is lost during the interval of time between the filling and the closing of the bottle. This gas is also lost from a partially emptied bottle when only a portion of the carbonated liquid or beverage, such as soda water, beer, etc., has been poured therefrom.

An object of my invention is to provide an improved stopper for vessels containing carbonated liquid wherein the stopper is provided within valve means integral therewith to prevent the escape of gas from the carbonated liquid.

Another object of my invention is to provide an improved stopper for vessels containing carbonated liquid wherein the stopper is formed of elastic material whereby the stopper is pressed onto the vessel and is maintained thereon by means of the elasticity of the stopper and the gas pressure within the vessel.

A further object of my invention is to provide an improved stopper having valve means integral therewith adapted to be used on vessels containing carbonated liquid wherein the stopper and its associated valve may be easily removed from one vessel and placed on another vessel.

With these and other objects in view which may be incident to my improvements, the invention consists in the parts and combinations to be hereinafter set forth and claimed, with the understanding that the several necessary elements, comprising my invention, may be varied in construction, proportions, and arrangement without departing from the spirit and scope of the appended claims.

In order to make my invention more clearly understood, I have shown in the accompanying drawings means for carrying the same into practical effect without limiting the improvements in their useful applications to the particular construction which, for the purpose of explanation, have been made the subject of illustration.

In the drawings:

FIG. 1 is a sectional view of one embodiment of my improved stopper secured to a bottle and having a plate valve associated therewith;

FIG. 2 is a sectional view of a second embodiment of my improved stopper secured to a bottle and having a lip valve associated therewith;

FIG. 3 is a sectional view of a third embodiment of my improved stopper secured to a bottle and having a plate valve associated therewith;

FIG. 4 is a sectional view of a fourth embodiment of my improved stopper secured to a bottle wherein a plate valve secured to the stopper is positioned within the neck of the bottle; and

FIG. 5 is a transverse section through the lip valve shown in FIG. 2.

Referring to the drawings and, more particularly, to FIG. 1, a bottle 1 containing a carbonated liquid or beverage such as soda water, beer and the like is provided at its opened neck portion with an elastic stopper having a thickened central body portion 2 provided with a plate

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valve 3 integral with the body portion 2, said valve closing an axial port 4 formed in the body portion 2. The stopper body portion 2 is secured to the neck of the bottle by means of a radially extending bent flange member 9.

When filling or emptying bottle 1, a device such as a tube is inserted into port 4 to push plate valve 3 away from body portion 2 thereby allowing carbonated liquid to be supplied to or poured from the bottle through port 4. Upon the removal of the tube from port 4, the elasticity of the plate valve, together with the gas pressure within the bottle, causes plate valve to snap back against body portion 2 closing port 4 to thereby prevent the loss of gas from the carbonated liquid to the atmosphere.

The embodiment of my improved stopper shown in FIG. 2 comprises an elastic body portion 2 having a lip or sheath valve 3 integral therewith closing an axial port 4 formed in the body portion 2. The body portion 2 is secured to the open end of the bottle by means of a hollow elastic member 5 extending inwardly of the bottle relative to the valve 3 and having a tapered portion 6 provided with slots 7; the body portion being also provided with a finger grip portion 8 to facilitate removal of the stopper from the bottle while the tapered portion 6 and slots 7 facilitate the introduction of the stopper into the bottle neck. From the above-described arrangement, it will be seen that the stopper is maintained in operative position on the bottle by means of the elasticity of the hollow member 5 acting radially outwardly against the neck of the bottle; also gas pressure within the bottle acts against the hollow member 5 forcing it radially outwardly against the neck of the bottle.

The embodiment of my improved stopper shown in FIG. 3 is similar to the stopper shown in FIG. 2 except a plate valve 3 is used instead of a lip valve.

The embodiment of my improved stopper shown in FIG. 4 shows the plate valve 3 disposed within the bottle neck and having the hollow member 5 extending outwardly of the bottle relative to the valve 3.

The operation of the stoppers shown in FIGS. 2, 3, and 4 is similar to the operation hereinabove described with regard to the stopper shown in FIG. 1; namely, a tube or other suitable device is inserted into port 4 to open plate valve or lip valve 3 thereby allowing carbonated liquid to be supplied to or withdrawn from the bottle 1. Upon removal of the tube from port 4, the elasticity of the plate valve 3 (FIGS. 3 and 4) or lip valve 3 (FIG. 2) together with the gas pressure within the bottle closes the valve thereby preventing the escape of gas from the bottle 1 through port 4 to atmosphere.

Although in the above-described stoppers, only one valve port has been shown in the stopper, it is contemplated to use two ports where desired so that as the bottle is filled, the second port serves as a vent for the air displaced by the liquid filling the bottle. This arrangement could also be used where the bottle is first filled with liquid through the first valved port and then charged with gas through the second valved port.

While I have shown and described preferred embodiments of my invention, I wish it to be understood that I do not confine myself to the precise details of construction herein set forth by way of illustration, as it is apparent that many changes and variations may be made therein by those skilled in the art, without departing from the spirit of the invention or exceeding the scope of the appended claims.

I claim:

1. A stopper for closing a neck opening in a bottle containing a carbonated liquid or the like, the combination comprising a body member made entirely of elastic material and including a head portion and a hollow shank portion adapted to extend into the neck opening, said

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head portion being integral with said body member and being adapted to seat on the exterior of the bottle neck, said hollow shank portion having one end integral with said body member and said head portion and having an opposite end defining an opening adapted to communicate with the interior of the bottle, a flexible wall defining an intermediate part of said hollow shank portion between its said ends and being adapted to resiliently engage the interior of the bottle neck whereby the stopper is secured thereto, said flexible wall being adapted to flex against the interior of the bottle neck in response to pressure in the bottle whereby the stopper seals the neck opening in the bottle, port means in said head portion for establishing communication with said hollow shank portion, and elastic valve means integrally formed on said head portion to control said port means.

2. The combination as recited in claim 1 wherein said valve means comprises a plate valve member.

3. The combination as recited in claim 1 wherein said valve means comprises a sheath valve member having its

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closed end axially extending into said hollow shank portion.

4. The combination as recited in claim 1 wherein said flexible wall has a slotted tapering portion adjacent the said opposite end of said hollow shank portion to facilitate insertion of the stopper into the bottle neck.

5. The combination as recited in claim 4 wherein said body member includes a finger grip to facilitate removal of said stopper from the bottle neck.

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