March 18, 1930. F. W. HOBAN 1,751,237

VALVE CONTROLLED CLOSURE FOR BOTTLES CONTAINING CARBONATED BEVERAGES

Filed May 31, 1928

Fig. 1.

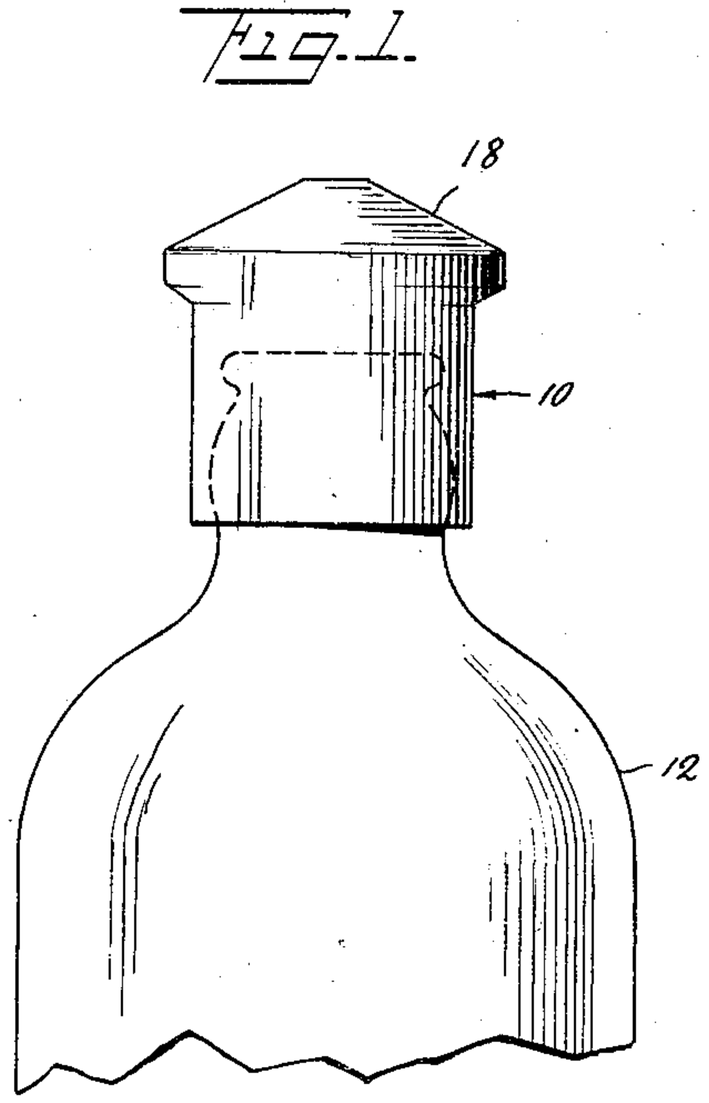


Fig. 2.

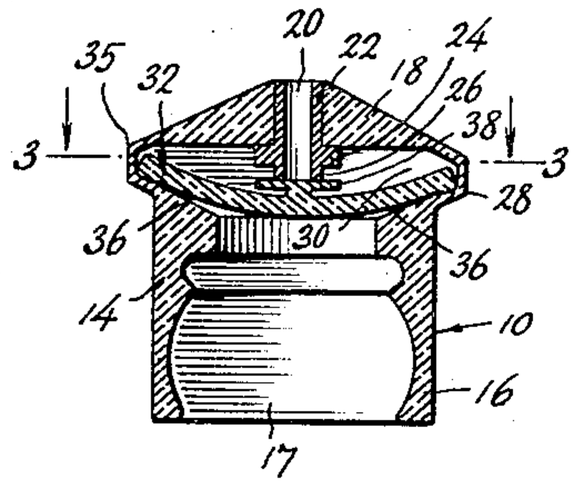


Fig. 3.

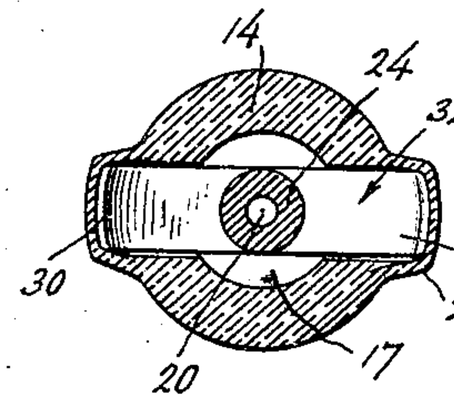


Fig. 4.

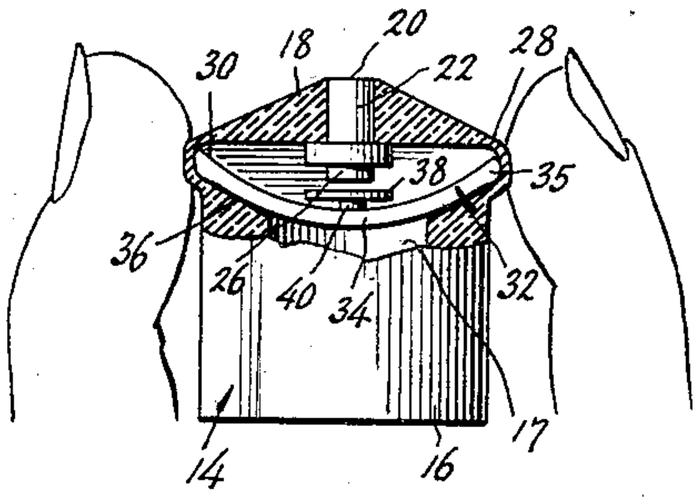
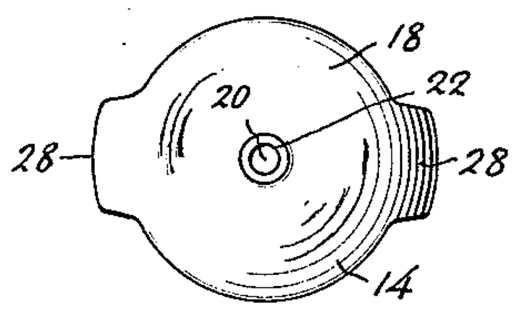


Fig. 5.



INVENTOR
Fairfield W. Hoban

BY
Dyke, Holden and Schaines
ATTORNEYS

Patented Mar. 18, 1930 1,751,237

UNITED STATES PATENT OFFICE

FAIRFIELD W. HOBAN, OF NEW YORK, N. Y., ASSIGNOR TO FAIRFIELD SPECIALTIES CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

VALVE-CONTROLLED CLOSURE FOR BOTTLES CONTAINING CARBONATED BEVERAGES

Application filed May 31, 1928. Serial No. 281,735.

My invention relates to means for closing or sealing the mouths of containers or bottles for carbonated beverages, such as ginger ale, vichy and the like, and the same has for its object more particularly to provide a simple, durable and efficient device which may be readily applied to the end of the container or bottle to replace the ordinary cap or stopper therefor when the same is removed, and which may be readily actuated to open the same to permit of the discharge of the contents of the bottle, and to close the same to prevent such contents from becoming "flat."

Another object of the invention is to provide a device of the character specified in which the valve means for controlling the discharge orifice of the device is disposed entirely within the confines of a member having wall portions impervious to air, and capable of engaging the neck of the bottle to provide an air tight cap or closure therefor.

Another object of the invention is to provide a device of the character specified in which the valve means thereof is actuated by depressing or deforming portions of the cap or closure receiving the same.

Further, said invention has for its object to provide a device of the character specified in which the controlling means for the discharge orifice thereof is disposed to become increasingly effective in sealing said orifice as the pressure within the container increases.

Further, said invention has for its object to provide a device of the character specified in which the body portion thereof is composed of a molded substance impervious to air and capable of yielding to form air-tight closure or cap for the container or bottle, and in which a valve of like composition for controlling the discharge orifice thereof is disposed entirely within the confines of said body portion in a flexed or tensioned condition normally effecting the closing or sealing of the discharge orifice of the device, and in position to permit of the actuation of the valve by depressing the wall portion of the cap or closure.

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

To the attainment of the aforesaid objects and ends, my invention consists of the novel features of construction, and in the combination, connection and arrangement of parts hereinafter more fully described and then pointed out in the claims.

In the accompanying drawing:

Fig. 1 is an elevation showing one form of device constructed according to and embodying my said invention, the same being applied to the open end of a bottle;

Fig. 2 is a vertical section thereof;

Fig. 3 is a cross section thereof on the line 3—3 at Fig. 2;

Fig. 4 is an elevation thereof, partly in section, illustrating the manner in which the same is opened; and

Fig. 5 is a plan thereof.

Referring to the drawing, the device 10, shown at Fig. 1 applied to the open end of the bottle 12, consists of a stopper or closure 14, preferably in the form of a cap, including a lower portion 16 having a relatively deep open recess 17 therein shaped and designed to receive the neck of the bottle, and to fit the same closely, forming an air-tight joint. The upper portion or tip 18 of the member 14 is provided with a discharge orifice 20, preferably reinforced by a metallic sleeve 22 disposed therein, and communicating with the interior of the device. The lower projecting portion of the sleeve 22 has a shoulder 24 engaging the portion 18 and an annular end or entrance portion 26.

The upper portion 18 of the member 14 is provided with projecting portions 28 located at diametrically opposite points substantially on a line with or a little above the annular inner end 26 of the discharge orifice, and providing interior recesses 30 extending outwardly from the portion of the recess 17 adjacent to the annular portion 26 above the end of the bottle.

The member or closure 14 preferably consists of a molded composition, such as rubber or rubber composition, which is sufficiently yieldable to fit tightly around the bottle, and is impervious to air and other gases. The

exterior or projecting portions 28 are preferably of reduced thickness to render the same more yieldable than the remaining portions of the device to permit of the same being readily depressed or deformed by the fingers for the purpose of actuating the valve means 32 as hereinafter described. Further, the entire member, including the portions 16, 18 and 28, are integrally formed, and the wall portions thereof, except for the discharge orifice 20 and the opening for the bottle, is imperforate throughout to provide an absolutely air-tight closure for the bottle.

The discharge orifice 20 is controlled by the valve means 32 disposed entirely within the confines of the device at the upper end of the recess 17. The valve means includes an elongated, naturally straight member or strip 34, composed of a material capable of being flexed, such as rubber, a rubber compound or the like.

The member 34 is disposed transversely of the device centrally across the recess 17 to leave passages at opposite sides thereof, and with the ends 35 thereof received within the recesses 30 upon the inwardly and downwardly inclined ledge portions 36, the member 34 being retained against displacement by the walls of the portions 28. A plate or valve portion 38 carried by the member 39 is adapted to engage and seat upon the edge of the annular entrance 26 to close the discharge orifice 20. The member 34 has the ends 35 thereof retained at a slightly higher elevation than the central portion thereof, by the engagement of the plate 38 with the annular portion 26, whereby to maintain the member 34 normally bowed under tension, exerting a spring action on the plate 38 to retain the plate in engagement with the edge of the entrance portion 36.

The valve portion 38 is composed of a material capable of yielding when engaged by the edge of the annular portion 26 to provide an air-tight closure, said portion 38 however having sufficient inherent rigidity to maintain its configuration when disengaged from its seat. For constructional purposes, the plate or valve 38 is preferably formed integrally with the resilient supporting member 34 to provide an element of homogeneous composition. The plate 38 is preferably connected to the member 34 by a flexible stem or neck 40 to permit of the plate seating evenly when the same engages the annular portion 26.

When it is desired to preserve the strength of the carbonated liquid contents of a bottle after the ordinary cap or closure thereof is removed, my device may be readily disposed over the end of the bottle to closely fit the same. The member 34, which is normally maintained under tension because of the elevated position of the ends 35 thereof relative to the central part thereof, tends to straighten out whereby to effectively force the plate 38 under spring pressure against the edge of the portion 26, the latter biting into the yieldable material of the plate to form a very tight joint. The gas pressure within the bottle also supplements the member 34 in maintaining the valve 38 seated, the greater this pressure the greater the force acting on the valve to retain the same seated.

The device 10, therefore, provides an absolutely air-tight closure for the bottle, and maintains the contents in their original condition for a considerable period of time, without the same becoming "flat". When the contents of the bottle are required for use, the bottle is inverted and the portions 28 are depressed by the fingers as shown at Fig. 4 to further bow the spring member 34 and to move the plate 38 to open the discharge orifice 20, whereby to discharge the contents from the bottle. By first shaking the bottle, the contents thereof, when the valve is opened, will be ejected with considerable force, due to the pressure developed by the release of part of the carbonic acid gas from the liquid. Upon release of the portions 28, the parts return, because of the resiliency thereof, to closed position as shown at Fig. 2.

By my invention, I provide a device which comprises two main parts, preferably of molded, yieldable or flexible material, which are readily assembled. The cap portion therefor forms an absolutely tight closure, except for the discharge orifice thereof, while the valve means 32 normally maintains said orifice effectively closed.

The valve means is disposed entirely within the confines of the device and actuated by the impervious yieldable wall portions of the cap or closure itself. My device is therefore absolutely devoid of actuating parts passing through openings in the wall portion thereof, whereby to obviate possibility of leakage.

The valve means is also constructed to normally effectively seat under the action of the member 34 to form a tight closure for the discharge orifice, the seating of the valve and the centering thereof being most effective because of the yieldability of the valve plate 38 and the flexibility of the stem 40 connecting said plate to the transverse member 34.

I claim:

1. A device of the character described comprising a recessed closure having a discharge passage provided with an entrance portion projecting into the recess, and a resilient valve member disposed within said recess and having a portion of yieldable material adapted to engage said projecting entrance portion, said valve member having a spring action normally closing said passage and providing a fluid tight joint between said entrance portion and said yieldable portion.

2. A device of the character described com-

prising a recessed closure having a discharge orifice and a yieldable wall portion, and a flexible valve member disposed within said recess and normally closing said orifice, said valve member being flexed by said yieldable wall portion to open said orifice.

3. A device of the character described comprising a recessed closure composed of molded material impervious to air and having a yieldable wall portion and a discharge orifice, and a valve member disposed within the confines of said closure below said discharge orifice and contiguous to said yieldable portion to be actuated thereby.

4. A device of the character described comprising a recessed closure having a discharge orifice and a yieldable wall portion, and a flexible valve member supported within said recess and normally tensioned to close said orifice, said valve member being actuated by said yieldable wall portion to open said orifice.

5. A device of the character described comprising a recessed closure having a discharge orifice, and a flexible valve member supported at the ends thereof within said recess and normally closing said orifice, said valve member being flexed to open said orifice by pressure applied to the end thereof through the wall of said closure.

6. A device of the character described comprising a closure having a main recess and recesses in the wall thereof laterally of said main recess providing downwardly inclined supporting ledges, and having a discharge orifice through the wall of said closure intermediate said ledges, and a flexible valve member received within said recesses and supported at the ends on said ledges in flexed condition to maintain said orifice normally closed under the spring action of said flexible member, said flexible member being actuated by pressure applied to the end thereof through the wall of said closure.

7. A device of the character described comprising a closure having a main recess therein and a discharge orifice through the wall thereof, and including wall portions having recesses extending outwardly from said main recess, certain of said wall portions projecting beyond the body of the device to provide a yieldable actuating means, and a flexible valve member for controlling said orifice received within the closure and supported at the ends thereof within said outer recesses in position to be flexed by said projecting actuating means.

8. A device of the character described comprising a recessed closure having a discharge orifice and a yieldable wall portion, and a flexible valve member supported at the ends thereof within said closure below said orifice adjacent to said yieldable portion to be actuated thereby.

9. A device of the character described comprising a recessed closure having a discharge orifice and a yieldable wall portion, a flexible member supported at the ends thereof within said closure contiguous to said yieldable wall portion, and a valve portion on an intermediate portion of said flexible member adapted to close said orifice.

10. A device of the character described comprising a recessed member having a discharge orifice and a yieldable wall portion, a flexible member supported at the ends thereof within said recess contiguous to said yieldable portion, and a plate of yieldable material having a flexible stem connecting the same to said flexible member intermediate the ends thereof.

11. A device of the character described comprising a closure having a recess therein and a discharge orifice therefrom through the end wall portion of the closure, said closure having a yieldable wall portion, and a resilient valve member disposed entirely within said recess and normally tensioned to maintain said orifice closed, said valve member being disposed adjacent to said yieldable wall portion to be actuated thereby.

12. A device of the character described comprising a closure having a recess therein, a discharge orifice through the end wall thereof, and wall portions at diametrically opposite sides thereof having recesses extending outwardly from said first named recess, a transverse flexible member supported at the ends thereof within said outer recesses and adapted to be actuated through certain of said wall portions, and a valve portion thereon adapted to close the inner end of said orifice, said transverse member being maintained by the engagement of said valve portion with said orifice in downwardly bowed, tensioned condition to render the tendency thereof to straighten out effective in maintaining said valve portion in engagement with said orifice.

13. A device of the character described comprising a closure having a main recess therein and a discharge orifice through the wall thereof, and including wall portions having recesses extending outwardly from said main recess, certain of said wall portions projecting beyond the body of the device to provide a yieldable actuating means, a transverse resilient member disposed entirely within the confines of said closure and having the ends thereof received within said outer recesses, and a portion thereon closing said orifice and maintaining said transverse member in downwardly bowed, tensioned condition, whereby to maintain said orifice normally closed under the spring action of said transverse member, and to effect the opening thereof by depressing said projecting wall portion.

14. A device of the character described

comprising a body member having a recess therein, and a discharge orifice through the end wall thereof, a metallic sleeve disposed within said orifice and projecting at the inner end thereof into said recess, said body member at diametrically opposite sides thereof having recesses extending from the first named recess, and having inwardly and downwardly inclined ledges, a transverse member supported at the ends thereof upon said ledges within said outer recesses, a plate portion adapted to engage the annular inner edge of said sleeve to seal the same, and a stem connecting said plate portion to said transverse member, said transverse member, said plate portion and said stem being molded together as an integral unit and formed from a substance capable of being flexed and of yielding, and said transverse member being normally maintained by the engagement of said plate portion with said annular inner edge in downwardly bowed, tensioned condition to render the tendency thereof to straighten out effective in maintaining said plate portion in engagement with said annular edge, and said transverse member being flexed to open said orifice by depressing certain of the wall portions forming said outer recesses.

In testimony whereof, I have signed my name hereto.

FAIRFIELD W. HOBAN.