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VALVE CONTROLLED CLOSURE FOR BOTTLES CONTAINING CARBONATED BEVERAGES

Filed May 2, 1929

Fig. 1.

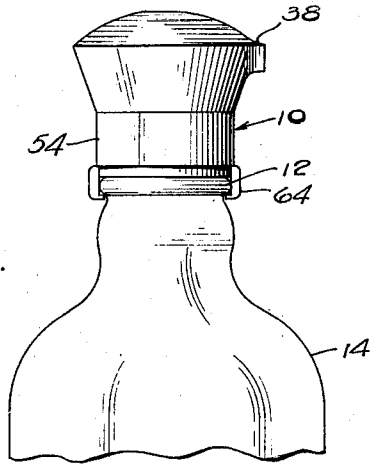


Fig. 2.

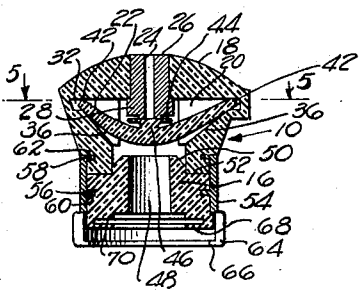


Fig. 3.

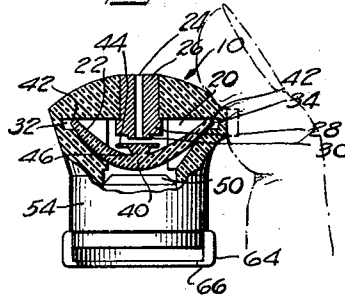


Fig. 4.

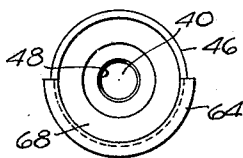


Fig. 5.

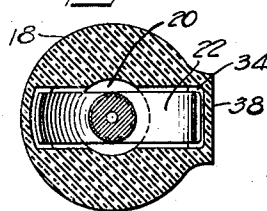
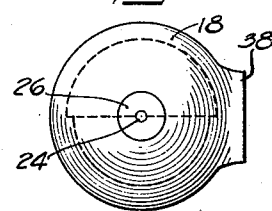


Fig. 6.



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VALVE-CONTROLLED CLOSURE FOR BOTTLES CONTAINING CARBONATED BEVERAGES

Application filed May 2, 1929. Serial No. 359,804.

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 latter is removed, and which effectively prevents the contents of the bottle from becoming "flat."

Another object of the invention is to provide a device of the character specified which will not become loosened because of the gaseous pressure in the bottle or container and thereby permit of leakage of the gaseous constituent of the beverage.

Another object of the invention is to provide a device of the character specified in which a portion thereof is subjected to the gaseous pressure within the bottle or container exerted in a direction to force said portion into close contact with the bottle or container to effectively seal the same.

Another object of the invention is to provide a device of the character specified in which the means for securing the device in place is in part mechanical and in part pneumatic.

Another object of the invention is to provide a device of the character specified which is mechanically clamped or secured to the bottle or container by engagement directly with the beaded lip thereof, whereby to provide a fluid tight joint at said lip without relying entirely on the contact between the elastic or yieldable portions of the device and the bottle for forming and maintaining such fluid tight joint.

Another object of the invention is to provide a device of the character specified in which the parts thereof may be readily manufactured and assembled at low cost.

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 drawings:

Figure 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 an elevation thereof, partly in section, illustrating the manner in which the valve means thereof is opened;

Fig. 4 is a bottom plan thereof;

Fig. 5 is a section thereof on the line 5—5 of Fig. 2; and

Fig. 6 is a plan thereof.

Referring to the drawing, the closure 10, shown at Figs. 1 and 2 applied to the lip 12 of the bottle or container 14, consists of a base member 16 and a valve receiving member 18, preferably made as separate parts for economy in manufacture and assembly. The member or portion 18 is provided with a recess 20 for receiving the valve 22 which controls the discharge orifice 24 through the tip or end wall of the member 18, preferably reinforced by a metallic sleeve 26 through which communication is established between the interior of the member 18 and the exterior. The lower portion of the sleeve 26 has a shoulder 28 and an annular entrance edge or portion 30.

The interior of the lateral wall of the member 18 is provided with recesses 32 and 34 having downwardly and inwardly extending or inclined ledges 36 and located at diametrically opposite points substantially on a line with or a little above the annular inner end 30 of the discharge orifice, and forming extensions of the main recess 20. The recess 34 is preferably formed in a portion 38 of the member 18 which projects beyond the body or main portion thereof and which constitutes flexible means for actuating the valve 22 as hereinafter described.

The members 16 and 18 preferably consist of a molded substance, such as rubber or rubber composition, which is resilient or yieldable and impervious to air and other gases. The projecting portion 38 is preferably of reduced thickness to render the same more

yieldable than the remaining portion of the member 18 to permit of the same being readily depressed or deformed by the thumb for the purpose of actuating the valve means 22 as hereinafter described.

5 The means 22 for controlling the orifice 24 is disposed entirely within the confines of the member 18 within the recess 20 and includes an elongated, slightly bowed member or strip 40, composed of a substance capable of
10 being flexed, such as rubber, or like substance.

The member 40 is disposed transversely of the device centrally across the recess 20 to leave the passages at opposite sides thereof, and with the ends 42 thereof received within the recesses 32 and 34 upon the inwardly and downwardly inclined ledge portions 36, the member 40 being retained against displacement by the walls of the recesses 32 and 34.
20 A plate or valve portion 44 carried by the member 40 is adapted to engage and seat upon the edge of the annular entrance 30 to close the discharge orifice 24. The member 40 has the ends 42 thereof retained at a slightly
25 higher elevation than the central portion thereof by the engagement of the plate 44 with the annular portion 30, whereby to maintain the member 40 normally bowed or flexed under tension, and exerting a spring action
30 on the plate 44 to retain the latter in engagement with the edge of the entrance portion 30.

The valve portion 44 is composed of a material capable of yielding when engaged by the edge of the annular portion 30 to provide an
35 air-tight closure, said portion 44, however, having sufficient inherent rigidity to maintain its configurations when disengaged from its seat. For constructional purposes, the plate or valve 44 is preferably formed
40 integrally with the resilient supporting member 40 to provide a unitary element of homogeneous composition, and is preferably connected to the member 40 by a flexible stem or
45 neck 46 to permit of the plate 44 seating evenly when the same engages the annular portion 30.

The lower or base member 16 is provided with a passage 48 communicating with the
50 recess 20 and a nose portion 50 extending into the latter, the contiguous surfaces of the members 16 and 18 engaging each other as indicated at 52. The members 16 and 18 are secured together or interlocked by being
55 forced into the annular retaining member or ferrule 54, the latter being provided with inwardly directed annular ribs or flanges 56 and 58 received into the annular recesses 60 and 62 of the members 16 and 18. The assembly of the members 16 and 18 is facilitated
60 because of the yieldability or resiliency thereof.

The ferrule 54 has a semi-circular depending portion 64 extending below the resilient
65 or yieldable member 16 and provided with an

inwardly directed ledge or flange 66 forming a channeled means for receiving the bead 12 of the bottle or container to secure the device thereto. The lower end of the member 16 has also an annular flexible flange or flap portion 68 forming an annular recess or space
70 intermediate the same and the body of the member 16 in communication with the passage 48. The flap portion 68 is adapted to engage the lip of the bottle or container 14 and is maintained into contact therewith by the gaseous pressure within the bottle.

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, the device 10 is applied to the bottle by engaging the mechanical securing means 64 with the bead 12 and imparting a slight rotary movement to the device which causes the means 64 to frictionally grip the bead 12 for mechanical securement, and forces the lip of the bottle into engagement with the yieldable material of the member 16. The gaseous pressure within the bottle exerted downwardly also forces the flap portion 68
80 into engagement with the bottle lip to form a fluid tight joint and to supplement by gaseous pressure the securing means 64 in holding the device on the bottle. By my invention the closure device is secured to the bottle in part by means which are mechanical and in part by means which are pneumatic, whereby to prevent the closure from becoming loose due to the excessive gaseous pressure within the bottle, and to prevent
90 said closure from permitting of leakage of the gaseous constituent of the beverage.

The member 40, which is normally maintained under tension because of the elevated position of the ends 42 thereof relative to the central part thereof, tends to straighten out whereby to effectively force the plate 44 under spring pressure against the edge of the portion 30, the latter biting into the yieldable material of the plate to form a very
100 tight joint. The gas pressure within the bottle also supplements the member 40 in maintaining the valve plate 44 seated, the greater this pressure the greater the force acting on the valve 44 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."
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When the contents of the bottle are required for use, the projecting portion 38 is depressed by the thumb as shown at Fig. 3 to further bow or flex the member 40 and to move the plate 44 to open the discharge orifice 24, 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
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release of part of the carbonic acid gas from the liquid. Upon release of the portion 38, the parts return, because of the resiliency thereof, to closed position as shown at Fig. 2.

5 The valve means 22 is disposed entirely within the confines of the device and actuated by the impervious yieldable wall portion of the closure itself. My device is therefore absolutely devoid of actuating parts passing
10 through openings in the wall portion thereof, whereby to reduce the possibility of leakage.

The valve means is also constructed to normally effectively seat under the action of the member 40 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 44 and the flexibility of the stem 46 connecting said plate to the transverse member 40.

20 The subject matter of my invention herein disclosed and not claimed is disclosed and claimed in my copending application Serial No. 281,735, filed May 31, 1928.

I claim:

25 1. A device of the character described comprising a closure for a bottle or container for receiving carbonated beverages, and means on said closure subject to the gaseous pressure in the container and forced downwardly thereby against the container, whereby to apply said gaseous pressure through
30 said means to said container in a downward direction and oppose the tendency of said gaseous pressure acting in the opposite direction to loosen said closure.

2. A device of the character described comprising a closure for a bottle or container for receiving carbonated beverages, and a flexible flap portion on said closure in position thereon to engage the lip of the container and to be exposed to the gaseous pressure in the container, whereby to force the flap portion against said lip.

3. A device of the character described
45 comprising a recessed closure for a bottle or container having a discharge orifice, a valve in said recess for controlling said orifice, and means on said closure operated pneumatically by the gaseous pressure within the bottle and adapted to be forced thereby into engagement with the bottle to form a fluid tight joint.

4. A device of the character described comprising a recessed closure for a bottle or container having a discharge orifice, a valve in said recess for controlling said orifice and normally closing the same, and means carried by said closure independently of said valve and operated pneumatically by the
50 gaseous pressure within the bottle and adapted to be forced thereby into engagement with the bottle to form a fluid tight joint.

5. A device of the character described comprising a closure having a body portion,
65 and a flexible flap portion thereon adapted

to engage a bottle or container, said flap portion and said body portion providing a space therebetween in communication with the interior of the bottle when the closure is in place thereon, whereby to utilize the gaseous pressure within the bottle for forcing the flap portion into engagement therewith.

6. A device of the character described comprising a closure for a bottle or container having a body portion of elastic or yieldable composition, and a relatively thin, flexible portion integral therewith adapted to engage the bottle, said flexible portion and said body portion providing a space therebetween communicating with the interior of the bottle, whereby to utilize the gaseous pressure therein for forcing the flexible portion into engagement with the bottle.

7. A device of the character described comprising a body portion of elastic or yieldable composition, and an inwardly directed annular, flexible, flap portion thereon at the base thereof forming a space therebetween adapted to communicate with the interior of a bottle or container, said flap portion being forced by the gaseous pressure in the bottle into engagement with the lip of said bottle or container.

8. A device of the character described comprising a member of resilient or yieldable composition, means thereon for securing the same mechanically in engagement with a bottle or like container, and means on said member operated pneumatically by the gaseous pressure within the bottle for supplementing said mechanical means in retaining the member in place and providing a fluid tight joint between the same and the bottle.

9. A device of the character described comprising a closure, means for clamping said closure in engagement with a bottle or like container to close the mouth thereof, and means on said closure subject to gaseous pressure within the bottle and forced thereby into engagement with the bottle to supplement said clamping means and provide a fluid tight joint between the interior of the bottle and the exterior thereof.

10. A device of the character described comprising a closure for a bottle or container for receiving carbonated beverages, securing means at the lower end thereof for mechanically engaging the container at the lip thereof, and means on said closure at the lower end thereof operated pneumatically by the gaseous pressure within the container for sealing said container about said lip.

11. A device of the character described comprising a closure of yieldable material for a bottle or container having a lip of beaded formation, a relatively rigid portion secured to the lower end of said closure, extending about a part of the periphery thereof, and providing a partial channel having

separated ends providing a gap of a width substantially equal to the diameter of the beaded lip adapted to receive the beaded lip of the container between said separated ends, said channel portion upon a slight rotary movement of the device frictionally engaging said beaded lip to retain the device in place.

12. A device of the character described comprising a closure for a bottle or container having a lip of beaded formation, said closure including a body portion of yieldable or resilient composition adapted to engage the lip of the bottle, and a depending relatively rigid channel portion disposed about a part of the periphery of the resilient portion and provided with a gap of a width substantially equal to the diameter of the beaded lip and adapted to receive the beaded lip and frictionally grip the same to retain the resilient portion in engagement with said lip.

13. A device of the character described comprising a closure for a bottle or container having a beaded lip, said closure including a body portion of yieldable or resilient composition having an annular flexible flange portion at the base thereof providing a recess intermediate the flange and body portions, and adapted to be forced by the gaseous pressure in the bottle against the lip thereof, and a depending channel portion thereon disposed about the periphery of the resilient body portion and adapted to receive the beaded lip and frictionally grip the same.

14. A device of the character described comprising a pair of members of resilient or yieldable composition, a ferrule receiving said members and interlocking therewith to retain the same at the contiguous ends thereof in fluid tight engagement with each other, said ferrule having an integral depending partial channel portion adapted to engage the lip of a bottle or container.

15. A device of the character described comprising a recessed member of resilient or yieldable composition having a discharge orifice, valve means disposed therein for controlling said orifice, a base member of like material having a passage therethrough adapted to communicate with the recess in said first member, a ferrule receiving said members and interlocking therewith to retain the same against separation in fluid tight relation to each other, said ferrule having a depending partial channel portion adapted to engage the beaded lip of a bottle or container and retain said resilient base member in engagement with said lip.

16. A device of the character described comprising a recessed member of resilient or yieldable composition having a discharge orifice, valve means disposed therein for controlling said orifice, a base member of like material having a passage therethrough adapted to communicate with the recess in

said first member, a flexible, annular flange on the lower end of said base member providing therewith a recess in communication with said passage, and adapted to be pneumatically forced against the lip of a bottle or container, a ferrule receiving said members and interlocking therewith to retain the same against separation in fluid tight relation to each other, and means on said ferrule adapted to engage the lip of said bottle or container and retain said resilient base member in position thereon.

In testimony whereof, I have signed my name hereto.

FAIRFIELD W. HOBAN. 80

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