June 3, 1941. W. L. KELMAN 2,244,460

DEVICE TO PREVENT THE REFILLING OF BOTTLES

Filed July 5, 1938

Fig. 1.

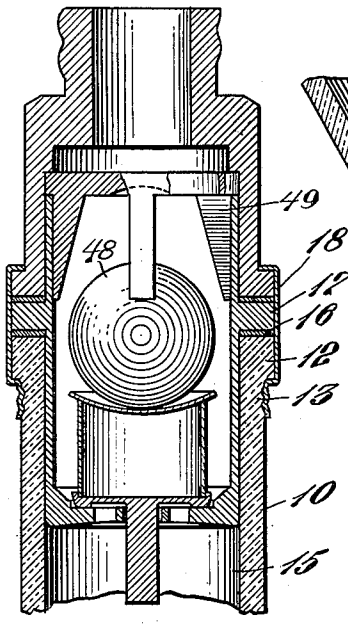


Fig. 2.

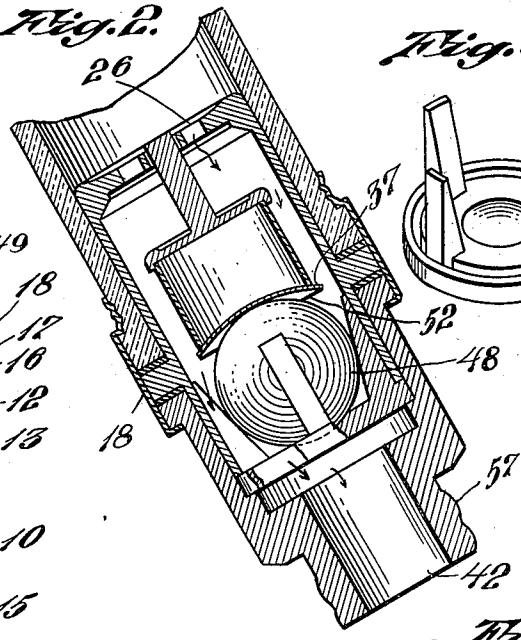


Fig. 5.

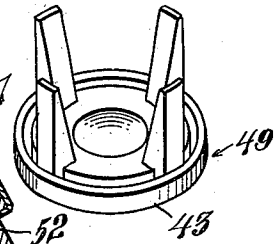


Fig. 6.

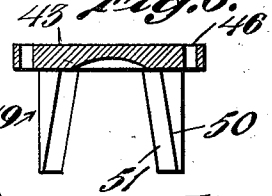


Fig. 3.

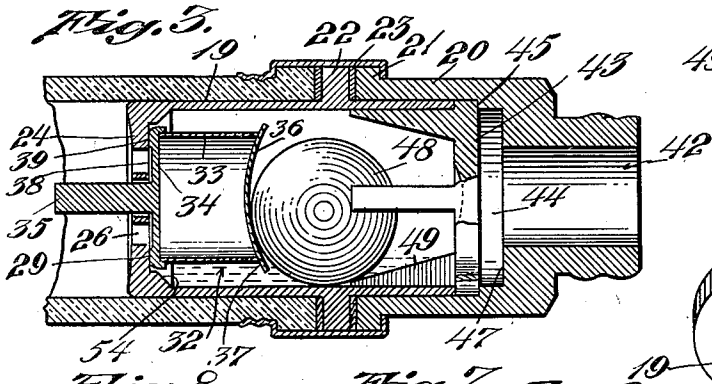


Fig. 4.

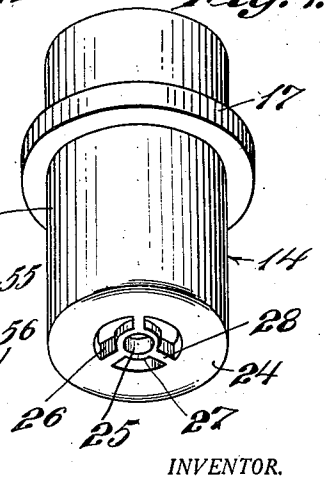


Fig. 8.

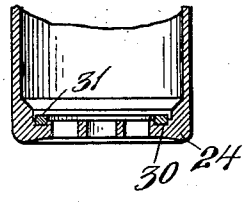


Fig. 7.

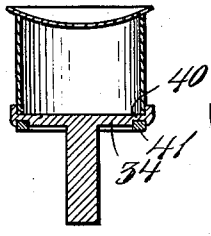
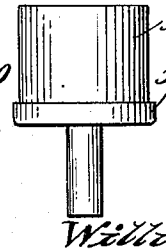


Fig. 9.



INVENTOR.
William L. Kelman
BY Barlow & Barlow
ATTORNEYS.

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DEVICE TO PREVENT THE REFILLING OF BOTTLES

William L. Kelman, Cranston, R. I.

Application July 5, 1938, Serial No. 217,341

3 Claims. (Cl. 215—22)

This invention relates to a device for preventing the refilling of a bottle or some like container; and has for one of its objects to provide a tamper proof device which will allow no liquid to enter the bottle through the controls in the device regardless of the position which the bottle is caused to assume or any vacuum which may be applied to the bottle.

Another object of the invention is to provide a construction which will permit liquid in the bottle to be poured out quickly and one which will not so restrict the liquid exit from the bottle as to make the structure impractical.

Another object of the invention is to provide a closure valve and a control therefor which will operate quickly and satisfactorily and yet provide a secure seat for sealing the liquid passage through the device.

Another object of the invention is to provide a bottle closure which may be made of such materials as glass or porcelain or such as will be acceptable for use in connection with distilled liquors where great care against contamination is of primary importance.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawing:

Fig. 1 is a sectional view of the device as mounted upon a neck of a bottle which is shown fragmentally;

Fig. 2 illustrates the same parts with the bottle in a different or nearly inverted position and showing the relation of the parts when the bottle is so positioned;

Fig. 3 is a sectional view of the device showing the position of the parts when the bottle is in a horizontal position;

Fig. 4 is a perspective view of one position of the device separated from the bottle neck and showing the bottom end thereof;

Fig. 5 is a perspective view of one of the guard and ball guides;

Fig. 6 is a sectional view of the structure of Fig. 5;

Fig. 7 is a sectional view of a modified form of float valve;

Fig. 8 is a sectional view of the lower part of the casing of the device in a modified form;

Fig. 9 is a different modified form of valve.

A device which is used to prevent the refilling of a bottle after emptied requires certain essentials of a tight closing valve which will respond in many different positions to close the opening into the bottle and usually some part supplemental to the valve is provided for accomplishing this result, such for instance as a ball. Devices which heretofore been offered to the market are usually objectionable in one way or another, such for instance as non-uniform action to permit an easy pouring of the liquid from the bottle or a sticking of some of the movable parts which act as a control. Other devices are so complicated as to be outside of practical costs as the expense of products is too great in proportion to the product upon which they are used. In order to overcome these difficulties, I have provided a rather simple structure and one which operates satisfactorily by reason of the general arrangement of its parts and the details which it contains, as will be more fully hereinafter explained:

With reference to the drawing, 10 designates the neck of a bottle which has at its upper end a flange 12 with some groove and rib formation 13 below the flange. The stopper device which is inserted into the neck of the bottle consists generally of a casing designated 14 which is inserted into the opening 15 of the bottle neck 10 with a washer or packing 16 between the end of the bottle and the flange 17, on the casing 14 so as to make a liquid tight seal, the casing being clamped in position by a crimped metal band or ferrule 18 rolled over the shoulder 17 and the flange 12 of the bottle neck 10. Some non-tamperable seal of this character may be utilized to hold the device in the neck of the bottle and prevent removing and replacing thereof.

The casing 14 consists of an inner part or cylindrical shell 19 and an outer cylindrical cap portion 20 which telescopes over the portion 19 with a flange part 21 of this upper portion abutting the flange part 22 of the shell 19 with some sealing packing 23 between the two if desired to provide a unit assembly. The lower end wall 24 of the casing is concave on its outer surface and is provided with a central guide opening 25 and a plurality of surrounding openings 26 for the passage of liquid therethrough. A ring 27 which is supported by the webs 28 from the outer portion of the wall 24 thus forms the guide opening 25. The inner surface of this wall 24 about the openings 26 provides a valve seat 29 which will be a finished or ground surface so that there may be a seal between it and the valve or optionally there may be a recess 30 provided in the lower wall 24, as shown in the modification of Fig. 8, and some softer material 31, such as cork or some other suitable valve seat surface, may be

provided for the accomplishment of this sealing action.

A valve 32 consists of a hollow body and is lighter than the liquid to be used so that the same will be buoyant. This valve is of a shell-like structure with side wall 33, bottom wall 34 having a guide pin 35 extending to fit loosely in the guide opening 25 in the wall 24 and with a top wall 36 which is concave and provides a flared flange 37 extending outwardly at its upper end. The under surface of the bottom wall 34 is provided with a slight concavity 38 around the guide pin 35 and a slight protuberance 39 adjacent its peripheral edge which is ground to provide a suitable seat for engagement with the seat 29 and form a seal of the opening when the valve is in closed position. In some cases instead of having the seat 39 formed by grinding of the protuberance I may form a recess 40 in the wall 34, as shown in Fig. 7, and provide some cork or resilient material 41 in the valve to engage the valve seat and seal the passage through which the liquid may flow.

In order to prevent tampering with the valve through the discharge opening 42 in the cap part 20 of the device, I have provided a disk 43 which stretches across the bore 44 of the part 20 and locks between a shoulder 45 in the bore and the upper end of the shell 19, as clearly shown in the sectional views 1, 2 and 3. This disk has openings 46 inward from its peripheral edge at such location as to be beneath the inset portion 47 of the cap 20 so that no wires may be poked into this end of the device. A ball 48 is located between the disk 43 and the valve and is relatively heavy, such as being of solid glass material. Arms 49 extend from the disk 43 inwardly toward the valve and are each tapered as at 50 to provide inclined surfaces 51 which are such as to cause the ball 48 to roll down these surfaces and engage the valve when the bottle neck is in horizontal position and move the valve to closed position. The lengths of these arms 49 is such that the ball will have a tendency to continually close the valve until it is fully seated.

When it is desired to pour liquid from the bottle, assuming that the bottle will be positioned, as shown in Fig. 2, the liquid may then pass through the openings 26 by reason of the ball rolling to the position shown in Fig. 2 and the valve following the ball the liquid will pass about the valve and about the ball which engages the arms but leaves a free space otherwise about it out through the opening 42 in the device. By reason of the flare 37 on the flange at the upper end of the float and the undercut portion caused by the space 52 between the valve and the ball, I have found that a very free flowing of the liquid outwardly occurs and commencement of the free flowing is assisted by reason of the valve seat being at the very outer edge of the float valve. If when in the position shown in Fig. 2 liquid is attempted to be allowed to enter the bottle the float valve will immediately lift and seat itself in closing position about the openings 26, as this valve is made lighter than any liquid which might be inserted.

If the bottle were placed in horizontal position the flange at the valve would rest upon the lower portion of the wall of the shell casing 19 and the ball would roll down to commence the closure of the float valve. Any liquid which might be attempted to be inserted when the bottle is in this position would assist the valve in floating up to permit the ball to more readily close the valve and no liquid could enter. The taper at 54 in the bore of the shell 19 also assists in positioning the valve and is exceedingly desirable from both an assembly standpoint and operation to assist in closing the valve when the device is in this position.

The size of the ball in the bore of the casing serves to govern the speed at which pouring is permitted. If the ball is too small with relation to the exit flow passage, such as opening 42, liquid will trap and the valve will float back to closed position and a jerky action of the valve will be encountered. If the ball is too large a jerky action will also be encountered by reason of the restriction on the valve side of the ball. The guide stem 35 will of course be proportioned with relation to the size of the ball so that it will at all times remain in its guide openings 25 and while the proportions of these parts are desired, as illustrated in the drawing, good mechanics will clearly dictate the relation of these parts which must be had in order that a smooth operating closure may be provided.

In Fig. 9 I have illustrated the valve as formed of solid parts and there shown a cork at 55 which is inserted within the fingers 56 on the valve for the floating action of the valve in case a hollow structure is not to be used.

The parts which I have described may be formed of porcelain or glass, while in some instances a metal alloy which may be more easily worked will be a suitable material for accomplishing the results which are desired.

The outer reduced end of the cap part 20 is provided with a thread 57 to receive a closure which may be threaded thereonto.

The foregoing description is directed solely towards the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

I claim:

1. In a device to prevent the refilling of a bottle or like container, a hollow casing insertable in the neck of a bottle and having an opening at its inner end with a valve seat about said opening, a valve in said casing to engage said seat and seal said opening and arranged to float in the liquid placed in the bottle, a guard disk positioned to close the upper portion of said casing and seating on the outer end surface thereof, a ball between said disk and valve to engage the valve and move it to its seat, and arms on said disk having a surface so disposed as to cause said ball to move into engagement with said valve when the casing is disposed in a horizontal position, a hollow cap member positioned about the outer upper portion of said casing and having a pouring opening and a shoulder in the interior thereof adjacent to said pouring opening and abutting said guard disk to secure the same in place, and means for securing said casing and cap member together.

2. A device to prevent the refilling of a bottle or like container, a hollow casing insertable in the neck of a bottle and having an opening at its inner end with a valve seat about said opening, a valve in said casing to engage said seat and seal said opening and arranged to float in the liquid placed in the bottle, a guard disk positioned to close the upper portion of said casing and seating on the outer end surface thereof

and having openings adjacent its outer edge, a ball between said disk and valve to engage the valve and move it to its seat, and arms on said disk extending from the outer edge thereof and tapered to provide a surface so disposed as to cause said ball to move into engagement with said valve when the casing is disposed in a horizontal position, a hollow cap member positioned about the outer upper portion of said casing and having a shoulder in the interior thereof abutting the outer edge of said guard outwardly of said openings to secure the same in place, and means for securing said casing and cap together.

3. In a device to prevent the refilling of a bottle or like container, a hollow casing having a bottom wall provided with an annular recess having a central opening and a plurality of liquid passage openings surrounding said central opening and with a valve seat about said openings and within said recess, a tapered annular wall connecting said recess with the upper surface of said casing, a valve in said casing assisted in movement to seated position by the said tapered wall and provided with a portion to engage said seat and seal said openings.

WILLIAM L. KELMAN.