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TAMPERPROOF CONTAINER DEVICE

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2 Sheets-Sheet 1
This invention relates to the prevention of tampering with containers and their contents. An object is the provision of novel means, simple in construction, and reliable in operation, for preventing the introduction of liquid into a container and for enabling the free pouring of the container contents so long as tampering has not been attempted. A feature of the invention, of prime importance, resides in provision for automatically and permanently locking the container against further use, in response to any endeavor to introduce liquid thereinto. In this way not only is there thwarted any attempt by an unscrupulous dealer or party to introduce cheap and inferior brands into bottles or other containers bearing labels of high quality goods, but the container is permanently incapacitated for further utility and a positive indication of attempted tampering is given. My invention further insures against the introduction of liquid in any position of the container, whether upright, horizontal, inverted, or in intermediate positions, and effects prompt locking of the container when tampering is attempted in any of these positions. Further objects and features of the invention will be apparent from the ensuing description and claims.

In the accompanying drawings:

Fig. 1 is a vertical sectional view through an embodiment of the invention, said embodiment being shown in the neck of a bottle, outlined by dot and dash lines. In this view the bottle is in upright position and the elements of the embodiment of my invention are in normal position.

Fig. 2 is a view similar to Fig. 1, but with the parts shown in locking position in response to an endeavor to insert liquid into the bottle.

Fig. 3 is a view similar to Fig. 2, but with the bottle turned into a position between the vertical and horizontal.

Fig. 4 shows the bottle turned horizontally, with the parts in position enabling pouring of the contents.

Fig. 5 is a view similar to Fig. 4 but with the parts in locking position.

Fig. 6 shows the bottle turned from the Fig. 5 position into a position between the horizontal and vertical, the parts being shown in locking position.

Fig. 7 is a view similar to Fig. 6 but with the parts in pouring position.

Figs. 8 and 9 show the bottle inverted, and the parts in locking and pouring positions respectively.

Fig. 10 is a detail perspective view showing the cradle of my embodiment.

Fig. 11 is a view in horizontal section taken on line 11—11 of Fig. 12.

Fig. 12 is a view similar to Fig. 1 but showing the application of a shim, when desired, for maintaining the apparatus in container-closing position in shipment.

Referring to the drawings, my invention is shown inserted in the neck A of a bottle A, though its use is obviously not restricted to any particular type of container. The embodiment of the invention here illustrated is shown as comprising a sleeve I having a cap 2 securely fitted thereon at one end and an integral flange 3 at the other end. Said cap and flange have openings 4, 5, respectively, for the passage of the contents of the bottle through the neck A in pouring. The sleeve may be securely retained in the bottle neck in any suitable or convenient way, as, for example, by a hood B covering the top of the flange 3 and then pressed over the ring or thread C of the bottle neck. The hood is provided with an opening D corresponding with the opening 5. Mounted within the sleeve I for limited sliding movement is a cradle 6 comprising an intermediate hub or body element 7 integral with a plurality of arms 8 extending longitudinally in the sleeve I and engaging the inner periphery thereof. Projecting from opposite faces of the hub 7 are studs or pins 9, 10 (which, of course, may be opposite end portions of a single member mounted in said hub). Each of the projections 9, 10 is adapted to enter a corresponding opening 11, 12, in the wall of a respective one of a pair of hollow balls 13, 14. In the normal position of the parts, as shown in Fig. 1, the balls rest against opposite faces of the hub 7, and lie between the adjacent cradle arms 8, with the ball 13 fitting into and closing the opening 4 in the cap 2 at the inner end of the bottle neck. If an attempt should now be made to introduce liquid into the bottle through the opening 5, such liquid cannot pass through said opening 4, which remains closed by the ball 13. On the other hand, as the liquid poured through opening 5 rises in the bottle neck, the ball 14 is carried upward with the rise in liquid level away from the projection 10 and is freed therefrom. Said ball is unbalanced, as by the concentration of weight at any suitable point, such as indicated at 14', whereby as soon as said liquid carries said ball beyond projection 10, the ball is turned into the position shown in Fig. 2, carrying its opening 12 away from the projection. The ball is now positioned...
between the projection 10 and a disk 15 mounted in the sleeve 1 in any suitable way as by arms 16 brazed or otherwise secured to one face of said disk and to said sleeve. The disk 15 is so spaced from the end of projection 10, with the cradle in the inner position shown in Figures 1 and 2, that upon the freeing of ball 14, as aforesaid said ball engages the under face of said disk. As the ball then turns by virtue of its unbalanced condition, a solid portion of its wall engages said projection, so that the cradle and the ball 13 are locked in their lower position (Figs. 1 and 2) and the opening 4 is maintained permanently closed by said ball 13. Not only is the liquid poured into the bottle neck thereby prevented from entering into the body of the bottle, but the latter is effectively and permanently locked against pouring or further use. In this connection it is to be noted that the ball 14 is continually biased into its position shown in Fig. 2, by virtue of its distribution of weight, and that access to said ball is prevented by arms 16 and the disk 15, the latter extending far enough into the sectional area of the sleeve 1. The bottle is thus incapable of further use, and any attempt to pour its contents therefrom is futile. This condition of the bottle provides evidence to a consumer that tampering has been tried, and further proves to the latter extending far enough into the sectional area of the sleeve 1. The bottle is thus incapable of further use, and any attempt to pour its contents therefrom is futile. This condition of the bottle provides evidence to a consumer that tampering has been tried, and further proves to the tamper tamper with bottles or other containers equipped with this device. The distance between the end of projection 10 and the bottom face of disk 15 may be very slightly greater than the diameter of the ball by the order of a thousandth of an inch, for example, so that the ball may turn particularly freely as soon as it clears said projection. At the same time, such clearance is unnecessary to permit turning of the ball, though it may be provided without interference with the effectiveness of the locking action above described.

In Fig. 3, the bottle is shown turned from its vertical position to a position between vertical and horizontal. The parts are shown in the locked position, resulting from pouring of liquid into the bottle neck. Here again the bottle is permanently locked against pouring, by the engagement of ball 14 between projection 10 and disk 15, said ball rising from said projection and turning into the position shown as the liquid rises in the bottle neck. The ball 14 thus maintains and is locked in the position wherein it closes the opening 4. Attempts are sometimes made to introduce liquid into a bottle by immersing the bottle in the liquid in a horizontal position. So long as the cradle remains in the position shown in Figures 1–3, wherein the ball 13 closes the opening 4, it is obvious that liquid cannot be introduced thereinto, whether the bottle be horizontal, vertical, or in intermediate positions, since the ball 13 will maintain the opening 4 closed. However, an attempt might be made to introduce liquid into the bottle by immersing it in horizontal position with the cradle and balls in pouring position, i.e., in a position (shown in Fig. 4) forward or outward from the position in the bottle neck shown in Fig. 1. This position of the cradle and balls may be reached by first tilting the neck A of the bottle up to the horizontal position and bringing it back gradually after immersion until the horizontal position is reached. The bottle, cradle, and balls are now in the position shown in Fig. 4. In this position of the bottle there is a water level between the bottom 16 of the sleeve 1 in the bottle neck and the lower edge 17 of the opening 4 into the bottle, which water level is intercepted by the ball 13. Said ball 13 will thereby be carried off the projection 9 by the first ingress of liquid into the neck A, and will close the opening 4, as shown in Fig. 5. The ball 13, like the ball 14, is unbalanced (as at 13) at one side of the opening 11, so that when it is freed from the projection 9, it turns to bring a solid portion of its wall into engagement with said said projection. The ball 13, as shown in Fig. 5, is now interposed between the end of the projection 9 and the walls of the opening 4, firmly closing said opening, and also being thereby permanently locked in closure position. It will thus be seen that, since the ball 13 is in the path through which liquid must flow from the opening 2 to the opening 4, said ball is carried by the first ingress of liquid into the closure position shown in Fig. 5, and is there locked in said closure position, preventing liquid from flowing into the bottle and also permanently locking the bottle against further use.

An important function of the cradle arms 8 is the maintenance of the major portion of the cradle periphery of the sleeve 1 for the attainment of a uniformly controlled pouring, as will be further discussed hereinafter. For the present it may be noted that the portions 8 of the cradle arms surrounding the ball 13 are flared outwardly to facilitate the cradle head 7 toward the opening 4, and that with the parts in the horizontal position (Fig. 4) the ball 13 drops under the action of gravity into contact with the underlying cradle arm portion 9. In this connection it may be noted that not only the ball 13 hollow, but the opening 4 therein is in a thin portion of the cradle, and the plate 10 is present between the ball and the projection 9, whereby the ball can readily drop onto said underlying cradle arm. The ball 13 is thereby brought further downward into the path of liquid flowing from opening 2 to opening 4. The arrangement referred to further renders the ball particularly sensitive to the ingress of said liquid and facilitates prompt movement of the ball to closing position in the opening 4 in response to flow of said liquid toward said opening.

The distance between the end of pin 9 and the walls of opening 4, with the cradle in the position shown, is such that upon freeing of the ball 13 from said pin, and turning of the ball to carry its opening away from said pin, the ball is locked in the horizontal position shown in Fig. 6. Minute clearance or tolerance may be provided between pin 9 and said walls, as noted in connection with pin 10 and disk 15, without disturbing the effectiveness of the lock.

The cradle arm portions 8 surrounding the ball 14 are also flared as shown, to accommodate said ball. In the position of the parts shown in Figs. 4 and 5, of course, the ball 14, though in the path of ingress of the liquid, is simply forced by said liquid in such direction as to seat against the hub 7 of the cradle.

Referring now to Fig. 6, the bottle is shown turned downwardly from its horizontal position to a position intermediate the horizontal and vertical. If an attempt be made to introduce liquid into the bottle in this position, as by siphoning, the ball 13 is carried forward, and brought back gradually after immersion in the liquid, and turns into the closing position shown, wherein it is locked between said pin and the walls of opening 4.

Fig. 7 illustrates the pouring of liquid from the bottle, the latter being in the same position as shown in Fig. 6, but with ball 13 engaged with pin
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2. Apparatus adapted to be inserted into a portion of a liquid container for protecting the contents thereof, said apparatus comprising a member for closing a pouring opening for said contents, means supporting said member for movement away from said opening in response to tilting of said container for pouring said contents, and means responsive to the introduction of liquid into said container portion for locking said member in a position wherein said opening is closed.

3. Apparatus adapted to be inserted into a portion of a liquid container for protecting the contents thereof, said apparatus comprising a member for closing a pouring opening for said contents, means supporting said member for movement away from said opening in response to tilting of said container for pouring said contents, said member being adapted to move to a position closing said opening in response to introduction of liquid into said container portion and to turn into a position wherein it is locked in said closing position.

4. Apparatus adapted to be inserted into a portion of a liquid container for protecting the contents thereof, said apparatus comprising means including a normally unbalanced member responsive to the introduction of liquid into said portion for movement into a position permanently locking said container against further use.

5. Apparatus adapted to be inserted into a portion of a liquid container for protecting the contents thereof, said apparatus comprising a member for closing a pouring opening for said contents, means movably mounted in said portion for providing separate passages for the egress of said contents and the ingress of air in pouring, and means cooperating with said member for enabling said member to lock said container against further use in response to introduction of liquid into said portion.

6. Apparatus adapted to be inserted into a portion of a liquid container for protecting the contents thereof, said apparatus comprising a member for closing a pouring opening for said contents, means movably mounted in said portion for providing separate passages for the egress of said contents and the ingress of air in pouring, said member being adapted, in response to introduction of liquid into said portion, to close said opening and to lie between a portion of said container means and the walls of said container whereby said member is locked in closing position.

7. Apparatus adapted to be inserted into a portion of a liquid container for protecting the contents thereof, said apparatus comprising a member for closing a pouring opening for said contents, means movably mounted in said portion and engaging said member, a second member engaging said means, means limiting movement of said second member away from the first mentioned means, the first mentioned member being adapted to move into a position wherein it is locked between said first mentioned means and said opening in response to introduction of liquid into said container portion when the container is in certain positions, and said second member being adapted to move into a position wherein it is locked between said limiting means and said first mentioned means to lock the first member in closing position in response to introduction of liquid into said container portion when said container is in other positions.

8. Apparatus adapted to be inserted into a portion of a liquid container for protecting the contents thereof, said apparatus comprising a member for closing a pouring opening for said contents.
contents, an element movably mounted in said portion and having a projection extending into said member when the latter and said element are in certain positions in said container portion, a second member, a projection from said element engaging said second member when the latter and said element are in certain positions in said container portion, means limiting movement of said second member away from said element, the first mentioned member being adapted to assume a position between said opening and the first mentioned projection for locking said container against further use in response to introduction of liquid into said container portion with said container in certain positions, said second member being adapted to assume a position between said second projection and said limiting means for locking the first mentioned member in closing position in response to introduction of liquid into said container portion with said container in other positions.

5. Apparatus adapted to be inserted into a portion of a liquid container for protecting the contents thereof, said apparatus comprising a member for closing a pouring opening for said contents, means so supporting said member, when the container is in horizontal position, that said member extends into the path of flow of liquid into said container portion, said member being adapted in response to said flow of liquid, to move into a position locking said container against further use.

10. Apparatus adapted to be inserted into a portion of a liquid container for protecting the contents thereof, said apparatus comprising a member for closing a pouring opening for said contents, means so supporting said member, when the container is in horizontal position, that said member extends into the path of flow of liquid into said container portion, said member being adapted, in response to said flow of liquid, to move to a position wherein it is locked between the walls of said opening and a portion of said supporting means.

11. Apparatus adapted to be inserted into a portion of a liquid container for protecting the contents thereof, said apparatus comprising a member for closing a pouring opening for said contents, means movably mounted in said portion and engaging said member, a second member engaging said means, means limiting movement of said second member away from the first mentioned means, the first mentioned member being adapted to move into a position wherein it is locked between said first mentioned means and said opening in response to introduction of liquid into said container portion when the container is in certain positions, and said second member being adapted to move into a position where it is locked between said limiting means and said first mentioned means to lock the first member in closing position in response to introduction of liquid into said container portion when said container is in other positions, and means inserted into said apparatus for locking said first mentioned member in position closing said pouring opening and concurrently preventing movement of the second mentioned member.

12. Apparatus adapted to be inserted into a portion of a liquid container for protecting the contents thereof, said apparatus comprising a member for closing a pouring opening for said contents, means movably mounted in said portion and engaging said member, a second member engaging said means, means limiting movement of said second member away from the first mentioned means, the first mentioned member being adapted to move into a position wherein it is locked between said first mentioned means and said opening in response to introduction of liquid into said container portion when the container is in certain positions, and said second member being adapted to move into a position where it is locked between said first mentioned means and said opening in response to introduction of liquid into said container portion when said container is in other positions, and means comprising an element interposed between said second member and said limiting means for preventing movement of said members and locking the first member in position closing said pouring opening.

13. Apparatus adapted to be inserted into a portion of a liquid container for protecting the contents thereof, said apparatus comprising a member for closing a pouring opening for said contents, means movably mounted in said portion and engaging said member, a second member engaging said means, means limiting movement of said second member away from the first mentioned means, the first mentioned member being adapted to move into a position wherein it is locked between said first mentioned means and said opening in response to introduction of liquid into said container portion when the container is in certain positions, and said second member being adapted to move into a position where it is locked between said limiting means and said first mentioned means to lock the first member in closing position in response to introduction of liquid into said container portion when said container is in other positions, and means inserted into said apparatus for locking said first mentioned member in position closing said pouring opening.