Dec. 9, 1947. A. J. HADERT 2,432,237

BOTTLE OR JAR CLOSURE

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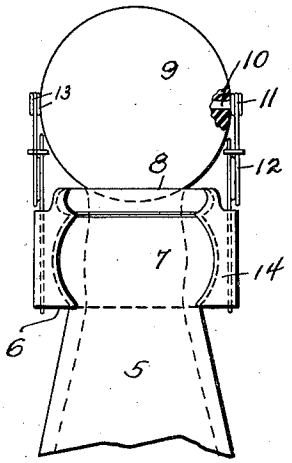



Fig. 2

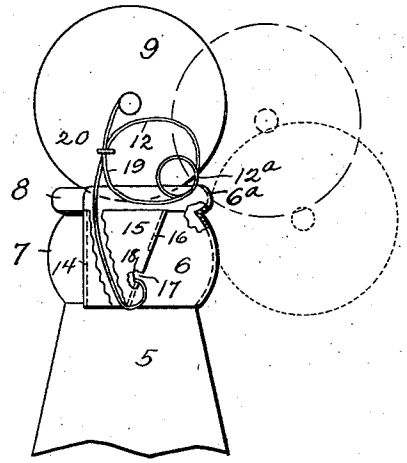



Fig. 1

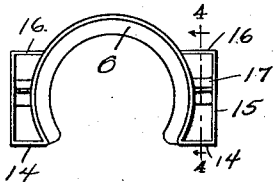



Fig. 3

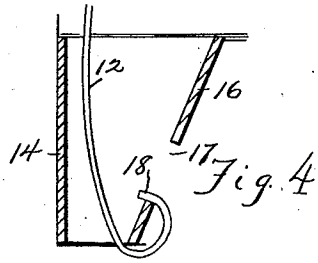



Fig. 4

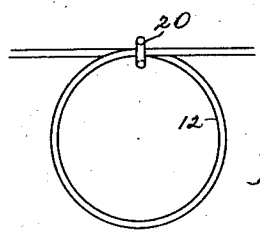



Fig. 5

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## BOTTLE OR JAR CLOSURE

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Application April 12, 1946, Serial No. 661,767

8 Claims. (Cl. 215—71)

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This invention relates to a jar or bottle closure of the character of that shown in my co-pending application, Serial No. 619,153, filed September 28, 1945.

The difference between this application and my aforesaid application will be best understood by reference to the accompanying drawings, wherein:

Figure 1 is a side elevation of a bottle closure, constructed in accordance with the invention;

Figure 2 is an elevation looking from the rear side of the saddle, hereinafter described;

Figure 3 is a plan view of the holder or saddle;

Figure 4 is a sectional view upon line 4—4 of Figure 3; and

Figure 5 illustrates a single convolution spring hereinafter described.

Like numerals designate corresponding parts in all figures of the drawings.

In the drawings, the numeral 5 designates the neck of a bottle to which the device of the invention is applied. A C-shaped saddle 6, formed of an elastic or springy material, is of such configuration as to snugly conform to the neck of a bottle adjacent the top thereof and to extend slightly more than half-way around the bottle neck. Thus this saddle may be snapped into engagement with the bottle neck and when applied has a firm hold upon the enlarged bulge 7 and the small flange or annular rib 8, the latter constituting the top of the bottle neck. The bulge 7 and annular rib 8 constitute the conventional circumferential enlargements of many types of soft drink bottles now on the market.

The closure proper consists of a ball 9, preferably of rubber, though of any suitable compressible material adapted to form a gas-tight joint with the bottle neck when seated squarely thereon. A shaft 10 extends through the ball and is provided at its ends with bearings for the reception of the ends 11 of loop springs 12. The ends of said springs are engaged between flanges 13 upon the ends of the shaft 10. The particular way of engaging the spring ends with the shaft ends is immaterial as long as the shaft is permitted to rotate freely, it being understood that the material of the ball firmly engages the shaft and that the shaft turns with the ball. The springs employed may be of the double convolution type, as illustrated in Figure 1, or of the single convolution type, illustrated in Figure 5. The lower ends of the springs are engaged with the saddle and to provide for such engagement the saddle is provided with outstanding ears, these ears comprising lateral end walls 14, side

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walls 15, and lateral end walls 16. The wall 14 is substantially vertical (see Figure 1) while the wall 16 is inclined rearwardly and is interrupted in its length to provide an opening 17 through which the terminal end 18 of the corresponding spring passes. This spring passes from that point, beneath the lower end of the wall 16, and thence upwardly through the housing constituted by the walls 14, 15, and 16. Above the housing it merges into the convolution 12 of the spring. A smaller convolution 12a may be formed in the length of the wire and the wire is then continued at 19 to its point of engagement with the shaft 10 as previously described. The wall 16 serves the additional purpose of limiting the downward throw of the ball to the dotted line position in Figure 1.

Thus it will be seen that this spring which is made up of spring steel wire is of the loop type by which I mean a spring in which the convolutions are wound in the direction or plane of the pull of the spring. In other words, the axes about which the convolutions are wound lie at right angles to the direction of pull exerted between the two ends of the spring. In open coil springs of this character there is a tendency to lateral separation of the wire runs at their point of crossing, this being especially pronounced in the case of a convolution of large diameter. To prevent this, I embrace the two wire runs at their point of crossing with means for limiting such lateral separation while permitting free movement of the wire through such means. Such means may take the form of a small washer 20, having its internal opening large enough to permit the necessary free endwise movement of the wire.

The primary purpose of the present invention is to provide a bottle closure adapted to be easily and quickly moved from open to closed position or vice versa and to be held securely in the position to which it is moved. A further object of the invention is to provide a closure of this character which may be flipped from open to closed or closed to open position with a finger or thumb of the same hand which holds the bottle. Thus a person having a glass in one hand is able to pick up a bottle and flip the ball closure to open position with the other hand.

It is important in the provision of any article of this nature to have it so designed that it may be easily and quickly applied to or removed from the bottle neck without the exertion of undue strength. These closures are intended to be used over and over again. They are not permanently

united with the bottle and as soon as the contents of the bottle has been consumed, the holder may be snapped therefrom and is ready to be snapped into engagement with another bottle and to there function to preserve the contents of a partly empty bottle against deterioration, or in other words, from becoming "flat." Therefore, while it is desirable to have the saddle engage the bottle neck in such manner as to cause the ball to function efficiently in sealing the bottle, it is also desirable to have the saddle sufficiently free in its movement to and from its position upon the bottle neck to permit of its application by a woman of average strength. This necessity for providing the saddle with a fair degree of ready release makes it necessary to provide means for assuring that the pull of the springs upon the saddle, as the ball rolls over the upper edge of the bottle neck and to its seating position, does not result in pulling the saddle loose from the bottle. The seated position of the ball is illustrated in full lines in Figure 1. The open position of the ball is illustrated in dotted lines in Figure 1. The point of greatest tension upon the springs is when the ball is in the dot and dash line position in Figure 1, because it is at this moment riding over the highest point in its travel. It will be observed that the saddle is so shaped as to comprise the relatively large bowed portion 6, and the smaller bowed portion 6*a*, the latter, as before stated, embracing the rib 8 at the top of the bottle neck. Thus this portion 6*a* constitutes a part upon which the ball rolls at the moment of greatest tension. In other words, the saddle has embodied in it a part constituting a path for the ball, which is so disposed that at the moment of greatest tension the strain imposed by the springs is exerted between two points upon the holder itself, namely, the bottom edge of the wall 16, and the upper edge of the bowed portion 6*a*. Thus this tension, while relatively great at this point, is not exerted in such manner as to tend to pull the saddle from the bottle. If the part 6*a* were absent and the ball rode over the bottle neck itself as it moved to the point of greatest tension, the direction of pull, coupled with such high tension would be likely to pull the saddle from the bottle unless the stiffness of the saddle and the tightness of its fit were such as to make it extremely difficult for a person of limited strength to snap it into position upon the bottle or to remove it therefrom. Since the tension of the springs is exerted between two points on the saddle itself it follows that not only may the spring tension be loaded in the manufacture of the device but that the application of the closure to the bottle is not against such spring tension nor against internal pressure of the bottle contents.

The vertical walls 14 of the housings serve the function of limiting the movement of the ball toward the left in Figure 1, because they lie in the path of movement of the lower runs of the springs. This insures that the ball will always be flipped toward the same side of the bottle, namely toward the side to which the holder is applied. This further insures that the ball will never be flipped over to the unobstructed or pouring side of the bottle.

The lateral walls 14 in addition to serving their function as stops and as parts to house the lower ends of the springs, provide abutments against which a user may thrust in removing the saddle from the bottle. The device of the present invention differs from my application aforesaid



most particularly in the form of the saddle and especially in the generic and essential difference that in the present application the pull of the springs is between two points upon the same saddle instead of between a point upon the bottle and a point upon the saddle.

The invention is not limited to any particular composition for the ball 9.

The device of the invention has the advantage that no external fastening device need be employed, in holding this structure upon the bottle, the elasticity of the saddle itself and the fact that it extends more than half-way around the bottle, serving all necessary purposes. The type of spring employed yields important practical advantages in that, since the convolutions are wound in the direction of the pull of the spring, the springs lie close to the ball and more or less in the recess which exists at the underside of the ball. In other words, the springs, while having a very considerable degree of elasticity project very little beyond the ends of the shaft 10. This provides a snug and compact structure adapted to be easily placed in or removed from refrigerators, and other close places, without catching on other objects.

The provision of the second and smaller convolution 12*a* not only adds additional elasticity to the spring but it increases the lateral stability of the spring and in conjunction with the washer 20, provides a spring which will stay in the proper plane and not be easily moved out of it to a point where it will be unsightly or catch on other objects, or permit lateral movement of the ball out of proper registry with the bottle neck.

It is to be understood that the invention is not limited to the precise construction set forth but that it includes within its purview whatever changes fairly come within either the terms or the spirit of the appended claims.

Having described my invention, what I claim is:

1. A closure for a bottle of the type which has a vertical open neck, which neck at its top constitutes the bottle mouth and the outer face of which neck presents a circumferential external rib at the top of the neck and a circumferential external arcuate bulge immediately below said rib, said closure comprising a saddle of resilient material of C-shape in horizontal profile and of slightly more than 180° in arc, said saddle being shaped in vertical profile to conform to the contour of said rib and bulge, a spherical ball of resilient material of a dimension to fit in the bottle mouth and seat upon the material of the bottle to seal the bottle mouth, a shaft by which the ball is carried, which shaft constitutes an axis about which the ball turns and a pair of springs, having upper and lower ends, the upper ends of said springs being engaged with the ends of said shaft and the lower ends of said springs being engaged with the saddle, that portion of the saddle which conforms to the said rib of the bottle extending enough upward and over said rib that the ball engages and rolls thereover at the point of greatest tension of the springs.

2. A closure as described in claim 1 wherein said springs comprise convolutions between their upper and lower ends which are wound about axes which are substantially parallel with said shaft.

3. A closure as recited in claim 1 in combination with stops carried by the saddle and disposed in position to be contacted by the springs and to prevent movement of the ball over to that side

of the bottle neck which is not covered by the saddle.

4. A closure as recited in claim 1 in combination with abutments formed upon the saddle and which abutments project outwardly from the saddle at the ends thereof and which abutments provide elements against which thrust may be exerted by the user in thrusting the saddle from its engagement with the bottle.

5. A closure as recited in claim 1 wherein the material of the saddle is turned outwardly at the ends thereof, then rearwardly and then inwardly to provide walls which complementally form housings for the lower ends of the springs and abutments against which thrust may be exerted by the user in thrusting the holder from the bottle.

6. A bottle closure for a bottle comprising a vertical neck having externally convex, protuberances extending therearound said closure comprising in combination a C shaped, snap on saddle of slightly more than 180° in horizontal length and shaped to be snapped over said protuberances by lateral thrust of the saddle toward the neck, a ball of yieldable material dimensioned to fit in and seal the neck of the bottle, a pair of springs having upper and lower ends, a shaft passing through and constituting an axis of rotation for the ball and to the outer ends of which the upper ends of the springs are connected, the lower ends of the springs being connected to the saddle, said springs comprising convolutions wound about axes perpendicular to the direction of pull of the springs, and stops upon the saddle positioned to engage the lower portions of the springs and prevent movement of the ball to that side of the bottle not covered by the saddle and to permit movement of the ball over upon the saddle at the opposite side of the bottle, said saddle extending far enough up and over the top of the neck that a part of the saddle lies between the ball and the point of attachment of the lower ends of the springs with the saddle, at the point of greatest tension of the springs when the ball is rolled from open to closed position, whereby the pull of the springs is exerted between two points upon the saddle at the time of maximum tension upon the springs.

7. A closure as recited in claim 1 wherein said springs each comprises one large and one small convolution between their upper and lower ends both of which convolutions are wound about axes



which are substantially parallel to said shaft, and tie means embracing the said ends at their point of crossing.

8. A closure for a bottle of the type which has a vertical open neck, which neck at its top constitutes the bottle mouth and the outer face of which neck presents a circumferential external rib at the top of the neck, said closure comprising a saddle of resilient material of C shape in horizontal profile and of slightly more than 180° in arc, said saddle being dimensioned to snap about the bottle neck when thrust laterally thereagainst, a spherical ball of resilient material of a dimension to fit in the bottle mouth and seat upon the material of the bottle to seal the bottle mouth, a shaft by which the ball is carried which shaft constitutes an axis about which the ball turns and a pair of springs having upper and lower ends, the upper ends of said springs being engaged with said shaft and the lower ends of said springs being engaged with the saddle, a portion of the saddle lying in the path of travel of the ball and extending far enough upward and inwardly over the rib at the top of the neck to provide a trackway over which the ball rolls at the point of greatest tension of the springs, whereby such tension is, at that time exerted between two points upon the saddle, namely between the points of attachment of the springs to the saddle and the point of contact of the ball upon said trackway.

ALBERT J. HADERT.


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