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A. MOELLER

2,292,149

BOTTLE STOPPER

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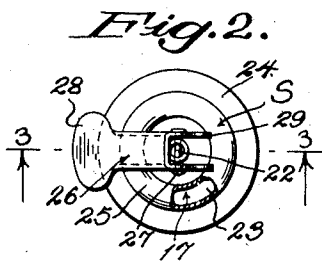
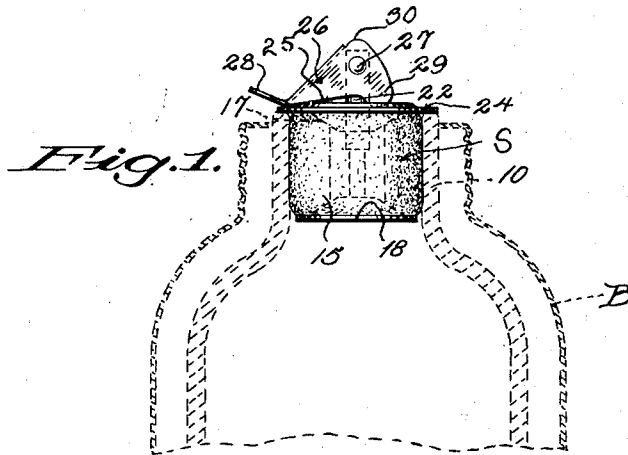


Fig. 3.

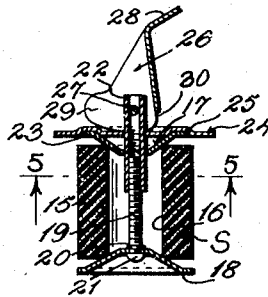
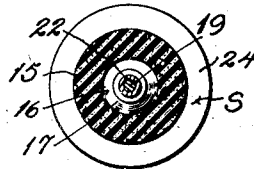
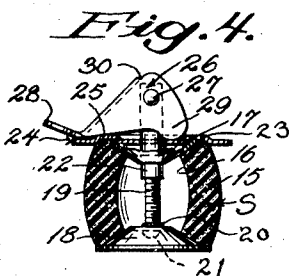


Fig. 4.



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UNITED STATES PATENT OFFICE

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BOTTLE STOPPER

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1 Claim. (Cl. 215-53)

This invention appertains to expansible stoppers for sealing the necks of bottles and like containers.

One of the primary objects of my invention is to provide a stopper embodying an adjustable sleeve carrying a swinging cam, with a pressure plate and a top cone slidably mounted on the smooth sleeve for movement by the cam toward an expansible sleeve confined between the said top cone and a bottom cone.

A further important object of my invention is the provision of a threaded stem carrying the bottom cone, with means for adjustably associating a sleeve having a smooth exterior surface with a stem upon which is slidably mounted a pressure plate and a cone.

A still further important object of my invention is the provision of novel means for associating the top cone with the pressure plate, whereby the top cone and pressure plate will be properly centered at all times relative to each other and to the sleeve and the expansible sealing member.

With these and other objects in view, the invention consists in the novel construction, arrangement, and formation of parts, as will be hereinafter more fully described, claimed, and illustrated in the accompanying drawing, in which drawing:

Figure 1 is a side elevation of my improved stopper, with the lever cam in its lowered, operative position, the stopper being shown applied to a vacuum bottle, the bottle being illustrated in dotted lines.

Figure 2 is a top plan view of the stopper, with parts thereof broken away and in section.

Figure 3 is a vertical, longitudinal, sectional view through the stopper, showing the lever cam in its raised, inoperative position, the view being taken substantially on the line 3-3 of Figure 2, looking in the direction of the arrows.

Figure 4 is a view similar to Figure 3, showing the lever in its lowered position and the body of the stopper compressed longitudinally for sealing contact with the neck of a bottle.

Figure 5 is a horizontal, sectional view taken on the line 5-5 of Figure 3, looking in the direction of the arrows.

Referring to the drawing in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter S generally indicates my novel stopper, and the same can be made in various sizes for association with bottles of different characters, such as pop bottles, vacuum bottles, and the like.

In the drawing, I have shown the stopper S of a size for use with vacuum bottles, and a fragment of a vacuum bottle B has been shown in dotted lines in the drawing. As the vacuum bottle B is of the usual character, the same will not be described in detail, but it is to be noted that the same includes a restricted neck 10.

My novel stopper S embodies a body portion 15, which can be formed from rubber or other compressible material. This body is provided with a relatively large, longitudinally extending bore 16, for a purpose which will later appear.

The opposite ends of the compressible body 15 are adapted to be engaged by top and bottom cone plates 17 and 18. These plates are stamped from sheet metal of the desired gauge, and it is preferred to have at least the bottom cone plate 18 formed from stainless steel. Rigidly secured to the axial center of the bottom cone plate is a threaded stem 19. The stem 19 near its lower end is provided with an annular shoulder 20, and the stem is inserted into the bottom cone 18 until the shoulder engages the cone. The bottom of the stem 19 can then be upset, as at 21, for intimate contact with the bottom face of the cone, and, if preferred, the stem can be welded to the cone.

The threaded stem 19 extends loosely into the bore 16 of the compressible body, and the upper end of the stem is received in an elongated, internally threaded sleeve 22, which also extends loosely into the bore 16 of the compressible body 15. The top cone 17 is mounted upon the sleeve 22 for sliding movement, and this top cone has formed thereon a peripheral, outstanding flange 23. The sleeve 22 also has slidably mounted thereon a top pressure plate 24. This top pressure plate 24 has struck up from the same an annular channel 25, and this channel 25 receives the flange 23 of the top cone. This allows the top pressure plate and the top cone to be centered relative to one another, and as the cone and the plate engage the smooth outer surface of the sleeve 22 at spaced points, tilting of the plate and cone relative to one another and to the sleeve is reduced to a minimum.

Disposed above the pressure plate 24 is a cam lever 26. This cam lever is connected to the upper end of the sleeve by means of a cross pivot pin 27. The cam lever 26 is also struck from a single piece of sheet metal, and the same is of a substantially U-shape in cross section. The upper end of the lever has formed thereon an annularly extending manipulating finger-piece 28.

The cam lips 29 on the lower end of the lever are adapted to engage the upper edge of the plate 24 as the cam is swung to a lowered position for moving the plate 24 and the top cone 17 toward the bottom cone 18. The lower edge of the lever opposite the cam lip 29 is rounded or cut away, as at 30, so that the danger of a person's finger catching between the cam lever and the plate 24 will be eliminated.

As the cam lever 26 is swung down, the cones 17 and 18 are moved toward one another, and, thus, the body 15 is compressed longitudinally, and the body will expand circumferentially, as is clearly shown in Figure 4 of the drawing. Thus, the compressible body will be forced into intimate sealing contact with the neck of the bottle, which will effectively prevent not only the escape of liquid from the bottle, but also the escape of gasses from the bottle.

By again referring to Figure 4, it will be noted that the cones 17 and 18 not only uniformly compress the body 15 longitudinally, but the cones themselves form an intimate contact and sealing engagement with the ends of the compressible body, and, hence, the leakage of liquid or gas past the compressible body and the cones is eliminated.

If preferred, the opposite ends of the compressible body can be slightly tapered to form snug engagement with the cones.

As heretofore brought out, the important feature of my improvement resides in the means of associating the sleeve 22 with the stem 19, and the top plate and top cone with the sleeve. By having the plate 24 and the cone 17 slidably mounted on the sleeve, a smooth bearing surface is provided, and, hence, these parts do not ride on any threads, and, thus, will not catch on any part of the stopper.

Obviously, by turning the sleeve 22 on the stem 19, an initial adjustment can be had in the stopper, and, thus, the stopper can be set for use with bottles having various sized necks.

Changes in details may be made without departing from the spirit or the scope of my invention, but what I claim as new is:

A stopper comprising, a conical lower plate, an upstanding, axially disposed threaded stem rigidly secured to and carried by the plate, an elongated, internally threaded sleeve adjustably mounted on the upper end of the stem, said sleeve having a smooth outer surface, a pressure plate slidably mounted on the smooth surface of the sleeve, a top cone plate slidably mounted on the smooth surface of the sleeve, a swinging cam lever pivotally mounted on the upper end of the sleeve for contact with the upper surface of the pressure plate, and an elongated compressible body extending the full distance between the lower cone plate and the upper cone plate and pressure plate having an axially disposed bore of greater diameter than the diameter of the stem and sleeve for loosely receiving the stem and the inner end of the sleeve, said pressure plate having an annular upstruck channel arranged in spaced concentric relation to its periphery, and said upper cone plate having an outstanding marginal flange fitted in said channel, whereby the upper cone plate and the pressure plate will be properly centered relative to one another and to the sleeve, the pressure plate extending beyond the outer edge of the cone plate and the compressible body, said cone plates properly centering the elongated compressible body relative to the threaded stem and sleeve.

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