

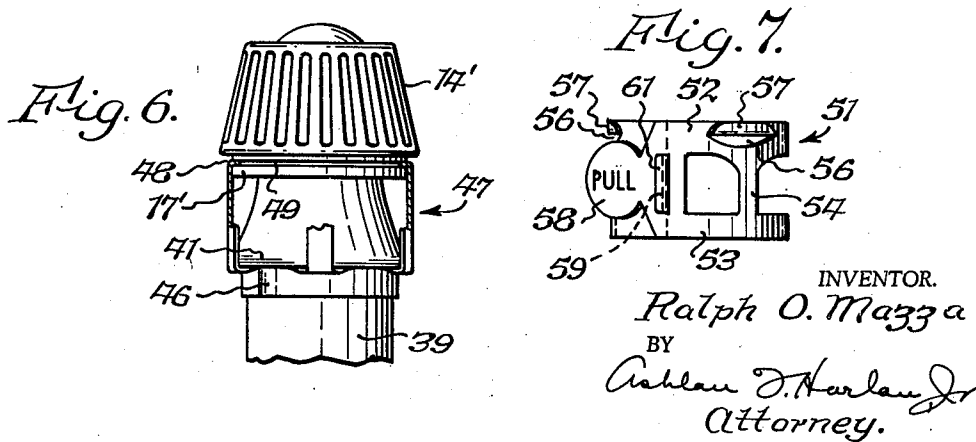
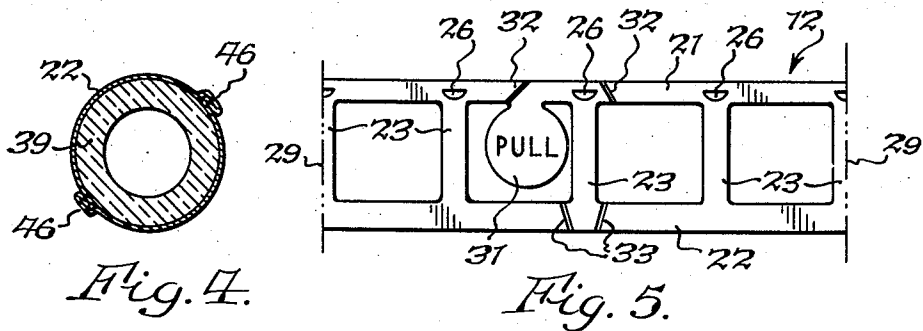
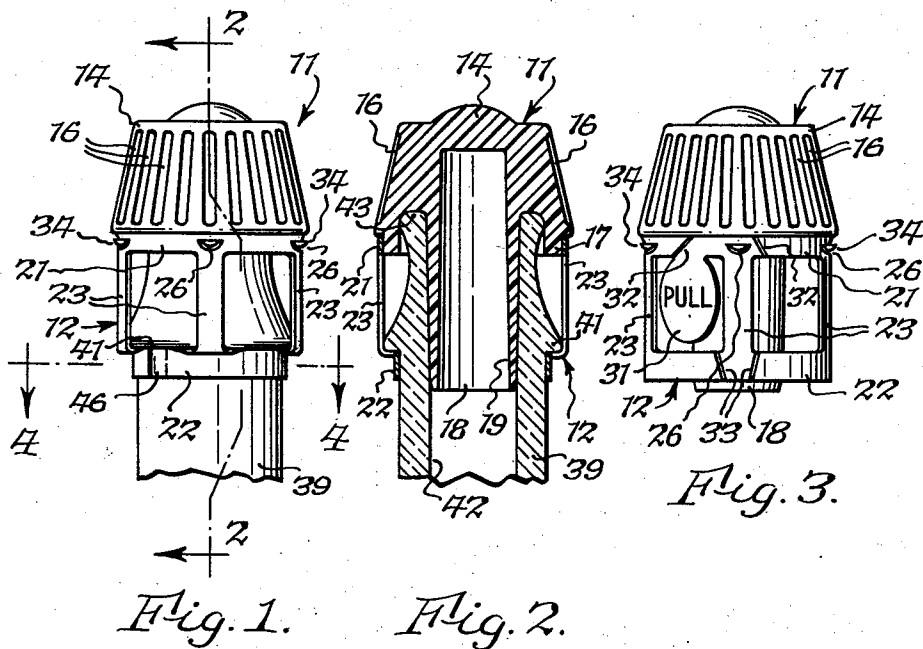
Aug. 30, 1960

R. O. MAZZA

2,950,834

PRESSURE RETAINING STOPPER

Filed Oct. 28, 1957



INVENTOR.

Ralph O. Mazza

BY

Asheau D. Harland Jr.
Attorney.

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2,950,834

PRESSURE RETAINING STOPPER

Ralph O. Mazza, 7405 Buffalo Ave., Niagara Falls, N.Y.

Filed Oct. 28, 1957, Ser. No. 692,610

4 Claims. (Cl. 215—95)

The invention of the present application relates to pressure retaining stoppers and is particularly concerned with stoppers intended for use in bottles containing beverages, such as champagne, under pressure.

Because of the relatively high pressure, which may be about 90 p.s.i. when the bottle is warm, existing in champagne bottles, it is necessary to provide mechanical means for holding the stopper in the mouth of the bottle. Traditionally, an ordinary cork has been used with wire securing it to the neck of the bottle. This has not been satisfactory, at least in part because the difficulties involved in twisting the wires while the cork is mechanically held in the bottle make costs excessive. While other types of fastenings have been suggested they, also, have been unsatisfactory and there has been until now need for a stopper which can be applied and secured easily and with means adapted for use with automatic filling machinery.

It is an object of the present invention to provide a stopper of the character described which is easy to apply and to remove.

Another object of the present invention is to provide a stopper of the character described which is securely held in the mouth of a bottle until its removal is desired.

A further object of the invention is to provide a stopper of the character described which is inexpensive to manufacture and is readily assembled.

Other objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings in which:

Figure 1 is a side view of a pressure retaining stopper according to one embodiment of the present invention, the stopper being shown in assembled position closing the mouth of a bottle;

Figure 2 is a vertical sectional view, taken on the line 2—2 of Figure 1, showing the interior construction of the stopper;

Figure 3 is a side view of the stopper shown in Figure 1 as viewed from another angle;

Figure 4 is a transverse sectional view on the line 4—4 of Figure 1 showing a portion of the stopper harness as applied to the neck of a bottle;

Figure 5 is a developed view of the retaining harness forming a part of the stopper shown in Figures 1 to 3;

Figure 6 is a view similar to Figure 1 in which there is illustrated a modification of the retaining harness and its attachment to the stopper body; and

Figure 7 is a side view of a further modified type of harness for use with stoppers according to the present invention.

In Figure 3 there is shown a preferred embodiment of the invention. It will be observed that the stopper body, generally designated by the reference character 11, and the retaining harness, generally designated by the reference character 12, are here assembled into a unit which may be easily applied to a bottle. The stopper body 11

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comprises a head 14, which may be provided with a series of grooves 16 to aid in turning the stopper, a depending skirt 17 and a hollow plug portion 18. The bore 19 in the plug portion 18 gradually diminishes in diameter inwardly from the open end and extends upwardly into the head 14. The wall of the plug portion is thus tapered in cross section. The stopper body 11 is preferably formed of flexible material such as molded polyethylene plastic.

The retaining harness 12 is preferably formed of thin aluminum or other ductile but strong metal. It comprises an upper border or ring 21 and a lower border or ring 22 which are parallel and joined at intervals by a plurality of tongues or connecting strips 23, thus providing a latticed structure with a plurality of openings through the harness 12. Above each of the tongues 23 there is provided in the upper ring or border 21 a perforation 26 which may conveniently be segment-like in shape with a curved or arcuate lower edge and an upper edge that is straight and parallel with said ring.

A tubular retaining harness 12 as illustrated in Figures 1 to 5 may be formed in any desired manner. Where large quantities of such harnesses are desired they may be conveniently and economically produced by extrusion. Smaller quantities may be made by dieing or punching out blanks shaped as illustrated in Figure 5 from suitable sheet metal and butt welding the end edges 29 to form tubular harnesses. Each harness is preferably provided with a pull tab 31 attached to the upper ring 21. Scoring as indicated at 32 and 33 is provided on the upper and lower borders 21 and 22, respectively, to facilitate tearing of the rings or borders when the harness is to be removed.

A stopper body 11 and a retaining harness 12 are assembled into a unit ready for use by fastening the harness to the depending skirt 17 of the stopper body. The skirt is provided with a plurality of spaced, integral, outwardly projecting ears 34, each of which has a flat upper surface and an outwardly tapered lower surface. The ears 34 are so spaced and formed that one of them is adapted to enter each of the perforations 26 in the upper border or ring 21 of the harness when the harness is pushed against the stopper body. Since the ears, being of plastic, are somewhat flexible and the lower faces thereof are beveled, no difficulty is encountered in assembling a complete stopper and harness unit. Once assembled, the harness is securely held against removal from the stopper body by engagement of the flat, upper edges of the perforations 26 against the flat upper surfaces of the ears 34.

In Figures 1 and 2, which illustrate the use of the pressure retaining stopper illustrated in Figure 3, the numeral 39 designates the neck of a bottle, such as a champagne bottle, which is provided with an annular flange or shoulder 41 projecting outwardly adjacent the mouth 43 thereof. As will be readily seen in Figure 2, the stopper body 11 with dependent harness 12 may be easily applied to the bottle by forcing the plug portion 18 of the flexible stopper body into the bore 42 of the bottle neck. The skirt 17 of the stopper head covers the lip of the stopper mouth and the lower border or ring 22 of the harness 12 extends downwardly around the neck 39 below the shoulder or flange 41.

To retain the stopper in the bottle the lower ring 22 of the harness 12 is crimped as shown in Figures 1 and 4 to prevent longitudinal movement of the stopper. The crimping, which may be done by any suitable means, is preferably carried out so that the projecting portions 46 of the border 22 formed thereby are situated between the tongues or connecting strips 23. Crimping, of course,

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reduces the diameter of the ring 22 and thereby causes the ring and the lower portions of the tongues 23 to be fitted closely against the bottle neck 39 below the outwardly extending shoulder or flange 41. The metal projections 46 formed by the crimping are preferably bent over to lie flat against the ring 22 as shown.

Figure 6 shows, applied to a suitable bottle, a modified form of pressure-retaining stopper according to the present invention in which the upper ring or border 48 of the retaining harness 47 is spun or otherwise forced into an annular groove 49 formed in the skirt portion 17' of the stopper head 14'. The construction of the latticed harness and the stopper head may be, except for the modifications necessary to join them in the described manner, otherwise identical with the structure illustrated in Figures 1 to 5.

Figure 7 illustrates a further modification of a retaining harness for use with pressure-retaining stoppers of the character described therein. This modification may be preferred when relatively small numbers are required. The harness 51 is similar to the one shown in the other figures and described above. However, it is preferably formed by dieing or punching from a sheet of metal a strip having longitudinal solid border portions 52 and 53 which are connected at intervals by connecting strips or tongues 54. At intervals around the upper border 52 in the areas opposite the tongues 54 suitable, preferably arcuate, slits are made by a die or other suitable means. The metal within each of the slits is folded back to provide an opening or perforation 56. These openings are employed in the same manner as the perforations 26 (Figures 1-5) to retain the harness on a stopper body, the folded back metal 57 over each of the holes 56 providing a smooth, non-cutting edge for engagement with the upper surface of one of the ears 34 thereon. A pull tab 58 is provided at one end of the strip forming the harness 51 and adjacent thereto there is provided a slot 59 adapted to receive a tab or finger 61 provided at the other end of the strip.

In practice, the modified type of latticed harness 51 illustrated in Figure 7 is punched out and formed as a flat strip from aluminum or other suitable, easily worked, but strong metal, and the metal is folded back to form the openings 56 as illustrated. The harness is then bent into cylindrical shape and the tab or finger 61 is inserted through the slot 59 and bent over as illustrated. The harness 51 may be assembled with a stopper body 11 in the same way as described above in explaining the embodiment illustrated in Figures 1 to 5, and the combined stopper body and harness thus produced may be applied to suitable bottles and crimped thereon below the annular flange or shoulder adjacent the bottle mouth in the same way as described above.

As indicated above, a stopper body and harness assembly as illustrated and described herein is readily applied to a bottle by machinery adapted for closing bottles which contain liquids under pressure. The crimping of the lower border of the harness is preferably performed by suitable machinery associated with the filling and closing apparatus but may, if desired, be done manually. After crimping the filled bottles may be handled and stored without danger of the stoppers being ejected. When it is desired to remove a stopper the pull tab 31, if the harness is of the types shown in Figures 1 to 6, is first pulled upwardly to rupture the upper ring or border 21 or 48 of the harness and then pulled downwardly to rupture the lower ring, thus freeing the stopper and allowing it to be withdrawn. Should the harness be of the type illustrated in Figure 7, the pull tab 58 is pulled counter-clockwise as viewed from the bottle top. The tab or finger 61 is thereby bent back and removed from the slot 59, the whole harness coming off so that the stopper is no longer held against removal.

It will be evident from the foregoing description that the present invention provides pressure retaining stoppers

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which satisfactorily meet the needs of the industry. They are inexpensive to manufacture, are easily assembled, and are easily applied to bottles and secured thereon. Being formed of non-porous materials they are unlikely to receive and retain any deleterious substances as is sometimes the case with porous stoppers. Moreover, stoppers according to the present invention may, if desired, be readily sterilized to prevent contamination of the contents of bottles.

It is to be understood that numerous modifications and variations in the construction illustrated and described herein may be made without departing from the spirit of the invention. Thus, for example, the stopper bodies may be made of other suitable flexible material instead of polyethylene plastic and the head of the stopper may be of any desired shape or configuration. Further, the harnesses may be shaped or formed somewhat differently from those illustrated, the differences between Figure 3 and Figure 7 indicating some of the possible variations. For example, the harness illustrated in Figure 3 may, if desired, have the metal from the perforations 26 bent back as it is in Figure 7. Also, while aluminum is preferred for construction of the harnesses, other metals may be employed under suitable conditions. It is, therefore, desired that the invention shall not be considered as limited to the construction illustrated and described, but shall be interpreted as broadly as permitted by the appended claims.

I claim:

1. A pressure retaining stopper for a bottle having an outwardly projecting annular flange adjacent the mouth thereof consisting of a hollow, flexible, plastic, stopper body having a depending skirt portion adapted to cover the mouth of said bottle, said skirt portion being provided with spaced, outwardly extending projections, and a cylindrical, latticed, metal harness concentric within said body and adapted to encircle the neck of said bottle, said harness comprising an upper border encircling said skirt portion and provided with perforations through which said projections extend, thereby to secure said harness to said stopper body, a lower border, said lower border being longitudinally spaced from said upper border a distance which will permit it to be crimped below the annular flange of said bottle neck when the stopper is inserted in said bottle, and a pull tab adapted when pulled to free said harness from said body.

2. A pressure retaining stopper for a bottle having an outwardly projecting annular flange adjacent the mouth thereof consisting of a hollow, flexible, stopper body having a depending skirt portion adapted to cover the mouth of said bottle, said skirt portion being provided with an annular groove, and a cylindrical, latticed, metal harness concentric with said body and adapted to encircle the neck of said bottle, said harness comprising a first ring encircling said skirt portion and having its upper edge engaged in said groove, thereby to secure said harness to said stopper body, a second ring, said second ring being longitudinally spaced from said first ring a distance which will permit it to be crimped below the annular flange of said bottle neck when the stopper is inserted in said bottle, and a pull tab adapted when pulled to free said harness from said body.

3. A cylindrical, latticed, metal harness adapted to be secured to a stopper body and to encircle the neck of a bottle, said harness comprising a first ring having means for securing said harness to a stopper body, said means consisting of a plurality of circumferentially spaced perforations adapted to engage on projections on said stopper body, a second ring longitudinally spaced from said first ring and connected thereto by a plurality of circumferentially spaced tongues, and a pull tab integral with said first ring and adapted when pulled to rupture said first ring.

4. A cylindrical, latticed, metal harness adapted to be

secured to a stopper body and to encircle the neck of a bottle, said harness comprising a first ring having means for securing said harness to a stopper body, said means consisting of a plurality of circumferentially spaced perforations adapted to engage on projections on said stopper body, a second ring longitudinally spaced from said first ring and connected thereto by a plurality of circumferentially spaced tongues, and a pull tab integral with said harness and adapted when pulled to open said harness.

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