No. 771,712. PATENTED OCT. 4, 1904.

H. COALE & L. S. GREENSFELDER.

BOTTLE CLOSURE.

APPLICATION FILED JAN. 20, 1904.

NO MODEL.

FIG. 1.

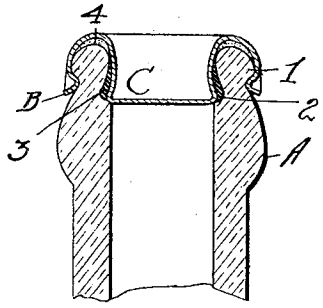


FIG. 2.

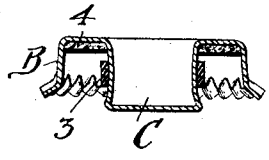


FIG. 3.

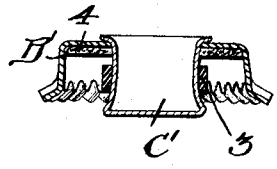
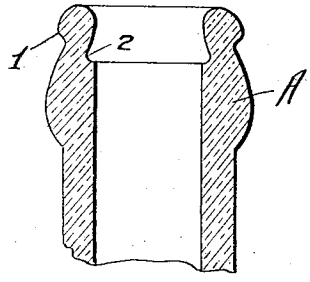


FIG. 4.



ATTEST:

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By Wm. Spear & Company

ATTYS

PHOTO-LITHOGRAPHED BY SACKETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

No. 771,712. Patented October 4, 1904.

UNITED STATES PATENT OFFICE.

HARVEY COALE AND LEWIS S. GREENSFELDER, OF BALTIMORE, MARYLAND, ASSIGNORS TO THE CROWN CORK & SEAL COMPANY, OF BALTIMORE, MARYLAND.

BOTTLE-CLOSURE.

SPECIFICATION forming part of Letters Patent No. 771,712, dated October 4, 1904.

Application filed January 20, 1904. Serial No. 189,901. (No model.)

To all whom it may concern:

Be it known that we, HARVEY COALE and LEWIS S. GREENSFELDER, citizens of the United States, residing at Baltimore, Maryland, have invented certain new and useful Improvements in Bottle-Closures, of which the following is a specification.

Our invention is an improved closure for bottles adapted to cover the throat and end or lip of the bottle and having sealing engagement with the bottle interiorly and exteriorly, our object being to secure in a single closure the effect heretofore secured in two distinct forms of closures well known as the "Crown" and "Aluminum," the first being disclosed in the patent of Painter, No. 468,258, dated February 2, 1892, and the latter in the reissue patent of Painter, No. 11,685, dated July 26, 1898, and in its specific form in the patent of Hall, No. 541,203, of June 18, 1895. The former is a metallic cap capable of being forced into locking contact with a shoulder upon the exterior of the bottle, while the latter is a plug or cup adapted to be expanded into a groove in the throat of the bottle.

We seek to attain greater security and strength, often required for bottles designed to hold liquids capable of generating or giving off gases or vapors when subjected to the heat of warm climates or when stored in compartments affected by high temperatures.

Our invention includes a form of closure capable of attachment to the bottle by engagement with an interior groove and an exterior shoulder, thus combining in one closure the two methods of attachment heretofore known separately, and it will be manifest that variations of the specific form of closure may be made without departing from the spirit of this part of the invention.

Our invention is illustrated in the accompanying drawings by two forms, these being representative and sufficient for purposes of illustration.

Figure 1 is a sectional view of the head of a bottle with our closure shown as in place thereon. Fig. 2 is a sectional view of the closure detached from the bottle. Fig. 3 is a sectional view of a modification, and Fig. 4 is a sectional view of the form of bottle used with the closure.

It has been found in practice that with even the most efficient closures of the type known as "single use" under excessive pressure, high temperatures, or when the bottled liquid is in transit for any considerable time there is more or less liability of waste by leakage, and we have found that this can be overcome by providing for a suitable bottle a closure adapted both to interior and exterior sealing, supplementing and sustaining each other, adding materially to the strength of the bottle-head, making very much more effective the character of the seal, rendering it possible to apply any pressure which the bottle will stand without leakage, and permitting transportation of the bottled goods to great distances without fear of leakage of either the gaseous or liquid contents.

Our improved form of closure requires a novel form of bottle, shown in Figs. 1 and 4 at A, and made the subject of a separate application. The exterior of the head or upper end of the bottle is formed with an annular bead 1 a suitable distance below the top, the under side of which forms a shoulder capable of holding the overhanging flange or rim B of the closure when forced into locking engagement thereunder. Within the throat of the bottle below the mouth is an annular groove 2 in a slightly lower plane than the bead 1, and this groove forms an interior shoulder into which the inner part of the stopper C of cup shape is adapted to be expanded and to remain in its expanded shape. The exterior bead and the interior groove are simultaneously formed by a tool applying at the same instant interior and exterior pressure.

To the bottle so constructed our improved closure is applied. As shown in Fig. 2, it is of one piece of suitable metal and combines in its configuration the cup-shaped internal closure, heretofore referred to, and the locking-flange of what is known as the "Crown" or external closure, and as the closure is

dropped into the bottle the inner seal is first applied by means of a suitable expanding-tool, expanding the wall of the closure into the groove 2 against a sealing medium 3, preferably of gasket form, as shown in Fig. 2. Thereafter the flange of the overhanging rim or cap is forced into locking engagement with the external shoulder, preferably compressing at the same time an interposed sealing medium 4, held in the annular channel formed by the depressed center and the depending flange and adapted to bear directly upon the upper end of the bottle, as shown in Fig. 1. It is apparent that this arrangement not only gives internal and external locking engagement for the cap with the bottle-head, but forms a double sealing and makes leakage impossible. We do not wish to be understood, however, as limiting ourselves to the use of two sealing mediums, as they may be combined in one, and under some circumstances one of the gaskets or rings may be omitted, as the other may be found to be sufficient; but where unusual security is desired we prefer to use the two, one receiving lateral pressure due to the expansion of the inner seal and the other the vertical pressure in the application of the cap or outer closure.

The sealing mediums used may be of any material suitable for the purpose. The inner and outer lateral strain is equalized by our invention, and the bottle-mouth is bound with metal.

In the modification shown in Fig. 3 we illustrate a closure having the double-sealing effect of this invention; but instead of being made of a single piece we find it to be possible to secure substantially the same result, though not to as great a degree as in the original form, by a two-part closure. In the modification we illustrate a crown-closure having its center formed with an opening, and a cup-shaped closure, known as the "Aluminum" and also before referred to, inserted within the opening, the flange of the cup extending beyond the line of the opening and serving to support the same. The crown is shown at B′ and the cup at C′. This form of the invention permits us to use the well-known closures referred to with slight change. The ordinary form of gasket we may use around the cup, as at 3, and an annular ring form of gasket 4 may fill the space formed by the downwardly-extending wall of the closure C′ and the flange of the cap B′. When this form of closure is applied, the expansion of the inner closure spreads the gasket 3 not only into the groove, but upwardly against the under face of the gasket 4, while the downward pressure to lock the flange in place compresses the packing 4, tending to force it tightly against the inner wall of the cup C′, thus effectually preventing escape of pressure or of the liquid contents of the bottle at the joint between the inner and outer closures.

What we claim is--

1. A closure for bottles covering the throat and end of the bottle and having sealing engagement with said bottle interiorly and exteriorly, substantially as described.

2. A closure for bottles covering the throat and end of the bottle and having locking engagement at two points, one on the interior of the bottle and the other on the exterior with sealing medium interposed and compressed by the engagement of the closure with the bottle, substantially as described.

3. In combination with a bottle having an inner groove and an outer shoulder, a closure fitted to the bottle end and having locking engagement with the interior groove and the exterior shoulder, substantially as described.

4. In combination with a bottle having an interior groove and an exterior shoulder, a closure fitted thereto and sealing medium interposed between the closure and the inner wall and top of the bottle, said closure being adapted to be compressed into locking engagement with the inner groove and the exterior shoulder, substantially as described.

5. A closure for bottles comprising a depressed center adapted to enter the mouth or throat of the bottle and to be expanded therein, with a flange adapted to fit over the top of the bottle and to be held in locking engagement with an external shoulder thereon, substantially as described.

6. A closure having a depressed center carrying a gasket and an annular part adapted to cover and overhang the bottle-top with a sealing medium held in the annular part, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

HARVEY COALE.
LEWIS S. GREENSFELDER.

Witnesses:
JOHN BLACK,
CHAS. H. KOPPELMAN.