

1,002,815.

Patented Sept. 5, 1911.

2 SHEETS-SHEET 1.

FIG. 1.

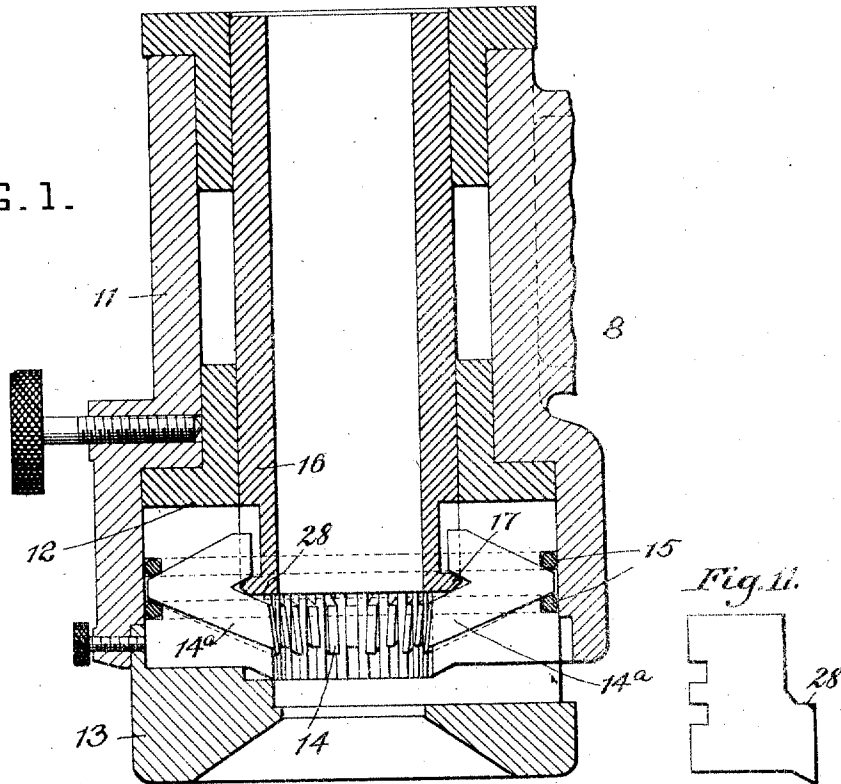


FIG. 2.

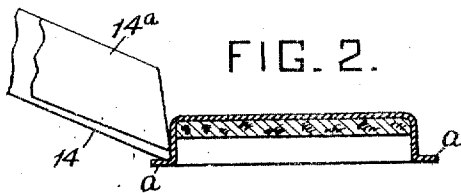


FIG. 4.

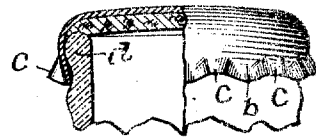


FIG. 3.

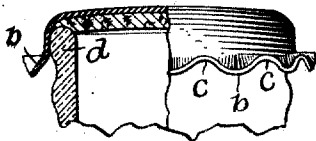


FIG. 6.

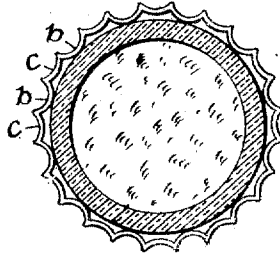
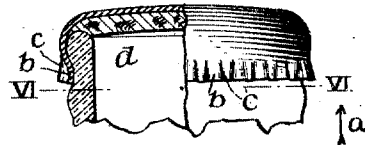


FIG. 5.



WITNESSES:

J. Herbert Bradley
Charles Bond

INVENTOR

Samuel C. Bond
by Christy and Christy
Atty's.

S. C. BOND.
SEALING AND CAPPING BOTTLES.
APPLICATION FILED DEC. 7, 1908.

1,002,815.

Patented Sept. 5, 1911.

2 SHEETS-SHEET 2.

FIG. 7.

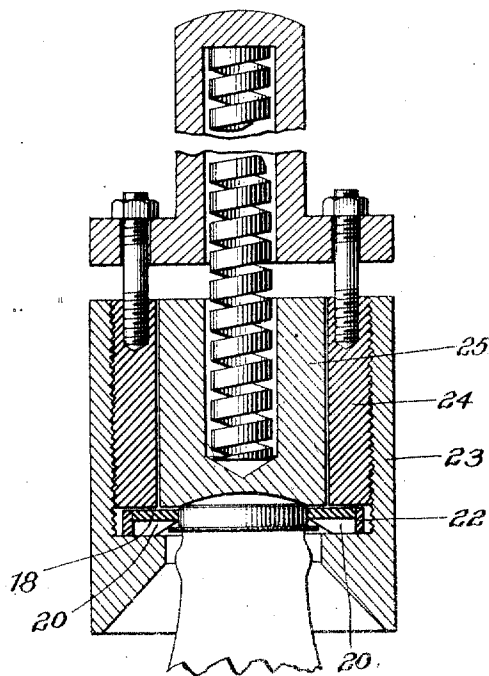


FIG. 8.

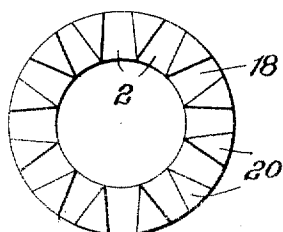


FIG. 9.

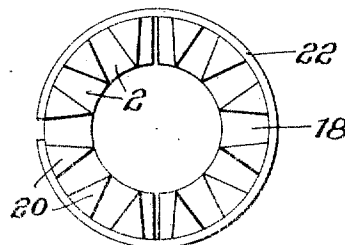
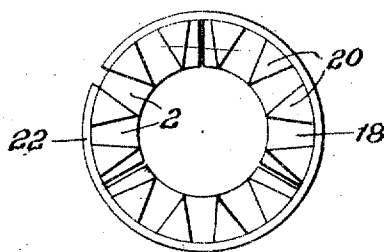


FIG. 10.



WITNESSES:

J. Herbert Bradley
Charles Barnard

INVENTOR

Samuel C. Bond
by Christy and Christy
Att'y's

UNITED STATES PATENT OFFICE.

SAMUEL C. BOND, OF WILMINGTON, DELAWARE, ASSIGNOR TO BOND BOTTLE SEALING COMPANY, OF WILMINGTON, DELAWARE, A CORPORATION OF DELAWARE.

SEALING AND CAPPING BOTTLES

1,002,815.

Specification of Letters Patent.

Patented Sept. 5, 1911.

Application filed December 7, 1908. Serial No. 466,376.

To all whom it may concern:

Be it known that I, SAMUEL C. BOND, residing at Wilmington, in the county of New-castle and State of Delaware, a citizen of the United States, have invented or discovered certain new and useful Improvements in Sealing and Capping Bottles, of which improvements the following is a specification.

10 In Letters Patent No. 898,595 and No. 899,004, dated September 15, 1908, I have described and claimed certain improvements in sealing bottles, said improvements consisting generally stated in seating a flanged
15 cap on a bottle and by pressure applied to the flange in a direction substantially parallel with the axis of the bottle, causing said flange to grip the bottle and firmly hold the cap in position thereon. In thus bending
20 the flange into engagement with the bottle a crimping or folding of the metal necessarily occurs, and if some portions of the flange are weaker than others such crimping will be localized along the weaker portions,
25 and consequently the cap will be locked to the bottle only where the crimps occur.

The invention described herein has for its object a practically uniform crimping of the flange and the forcing of the crimps into
30 locking engagement with the bottle.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings forming a part of this specification, Figure 1 is a
35 sectional view of a sealing head of the type shown in the patents referred to, and embodying my improvement; Fig. 2 is a detail view showing a cap and the cap seating and locking fingers at the beginning of the cap-
40 ping operation; Figs. 3, 4 and 5 are views partly in elevation and partly in section illustrating progressive steps in securing the cap to the bottle; Fig. 6 is a sectional view
45 on a plane indicated by the line VI—VI Fig. 7 is a sectional view of the arrow *a*; Fig. 8 is a sectional view of a different type of capping head but embodying my im-
50 provement; Figs. 9 and 10 are plan views of modifications of my cap-applying device, and Fig. 11 is a detail view of the filling
pieces showing the shoulder which serves as a support for the locking fingers or struts.

It will be readily understood by those skilled in the art that any suitable form of
55 mechanism may be employed for shifting

the sealing head or the bottle supporting table or both relative to each other.

The head 8 is formed in part by shell 11, having an enlarged lower portion for the reception of the radially slotted annular block 12, which is held in position by the annular
60 plug 13, removably secured to the shell 11. The inner walls of the plug are made flaring so as to serve as a guide for the bottle. Struts or fingers 14 are so pivotally sup-
65 ported in the slots in the block 12, which has an internal diameter somewhat greater than the greatest diameter of the cap, that the portion of said struts designed to engage the cap will be in a plane below the plane
70 of the pivotal points of the struts, and will lie in a circle having a diameter intermediate of the greatest and least external diameters of the cap. These struts are held from
75 outward radial movement, so that when their inner ends are shifted relatively to their pivotal points, by engagement with the flange of the cap, such ends will move in
toward a common center, until they bear
80 against the side walls of the cap as herein-after described. These struts are preferably V-shaped, and are pivotally supported at or adjacent to their apices. In the construction
shown their apices project between
85 rings 15 arranged in grooves formed in the outer periphery of the block 12, said rings being split to permit of their easy insertion into the grooves.

While the normal position of the struts may be determined by any suitably arranged
90 stop, against which the struts will move after a cap has been secured on a bottle, it is preferred to control the return movements of the struts by means of a sleeve 16 freely
95 movable in the shell 11, and provided at its lower end with a flange 17 adapted to project between the legs of the struts. This sleeve normally rests on a shoulder 28 formed
on the inner wall of the block 12, and when
100 in this position the upper legs of the struts will rest on the flange 17, and thereby hold the struts in proper operative positions. This construction whereby the struts are held in proper normal position is preferred,
as it will perform another very important
105 function, *i. e.*, insure the simultaneous movement or operation of all the struts.

It has been found in practice that in case portions of the flange *a* of the cap are
weaker either by reason of the metal being 110

thinner at such points, or for some other cause, there will be a localization of the crimps necessarily formed in the flange *a* when the latter is bent from position at right angles to the axis of the cap down to or approximately to parallelism with such axis, in locking the cap to the bottle. When the crimps are thus localized the stronger portions of the flange will be simply bent down without any material crimping action, upon the bottle, and will not fully engage under the head of the bottle. In order to prevent any such localization of the crimps from any cause and to insure a uniform crimping at all points, provision is made for a preliminary crimping of the flange before any material bending of the same into locking engagement with the bead on the bottle can occur. To this end a portion of the fingers or struts are made a little longer than the others, so that such longer struts will engage the flange in advance of the others, and by reason of such engagement will partially crimp or dent the flange as indicated at *b* before the flange as a whole has been bent or materially turned down toward locking engagement with the bead of the bottle. After this crimping action by the fingers or struts 14, the shorter fingers or struts 14^a will come into engagement with the flange at points intermediate of the crimps or bends produced by the struts 14. As both series of fingers or struts have the portions engaging the flange lying in a common circle, it will be evident that as the bending progresses the portions of the cap in contact with the struts 14 will be bent to such an extent that the struts will no longer bear upon them in a direction to force them in under the bead and that thereafter the movement of the portions *a* into locking engagement with the bead will be caused by the pressure of the struts 14^a upon the portions *c* of the flange intermediate of the portions *b*. This progressive action of the two series of fingers is clearly illustrated in Figs. 3, 4 and 5. In Fig. 3 the preliminary crimp *b* is clearly shown, the part *c* intermediate of such crimps being practically in normal position or in the position occupied by the flange before the cap has been pressed upon a bottle. In Fig. 4 the portion *c* has been bent down and in its movement coacts with the struts 14 to force the portion *b* of the flange partially under the bead *d* of the bottle. When the parts of the flange have reached the position shown in Fig. 4, the struts 14 will merely slide along the portions *b* and not exert any downward pressure thereon, but the struts 14^a will continue to bear down and force the portions *c* inward, and thereby press the portions *b* more tightly under the bead *d*. The action of the struts 14^a on the part *c* will be such as to force the portions *c* to a greater or less extent under the bead *d*,

but not to the extent to which the portions *b* have been forced by the pressure of the struts 14^a on the portions *c*.

By reason of the preliminary crimping imparted by the series of fingers or struts 14, the crimps will be uniformly distributed throughout the entire circumference of the flange, and there will not be any material localization of the crimps.

In the construction shown in Figs. 1 to 6, inclusive, the seating of a cap on a bottle is effected solely by the pressure exerted by the fingers or struts on the flange as clearly set forth in the Letters Patent hereinbefore referred to. As shown in Fig. 7 my improvement can be applied to that form or type of machine in which the seating of the cap is effected by a plunger and the bending of the flange into locking engagement with the bottle is effected by devices operative independent of the plunger. In this form or type of machine, the flange bending device may consist of a ring 18 either integral or formed in two or more sections, as shown in Figs. 8, 9 and 10. On the underside of this ring are formed shoulders or projections 20 preferably V-shaped which will operate to effect the preliminary crimp corresponding in operation to the series of fingers 14 heretofore described. These projections are made of such a height that as soon as they have effected the crimping of the parts *b*, the portions 2 of the ring intermediate of the projections will come into operation and operate on the portions *c* intermediate of the bent portions *b*. These rings are made of an internal diameter a little greater than the diameter of the body of the cap to which they are to be applied, so that they would readily pass down over the cap into engagement with the flange, and can be withdrawn after the flange has been bent into locking engagement with the bottle. On account of the variations in the external diameter of the bead portion of the bottles, it is preferred that the rings should be made in sections as shown in Figs. 9 and 10, and that such sections should be yieldingly held in proper position by a spring 22 of any suitable form or construction. In the type of machine shown in Fig. 7 this ring is supported in a head 23 and held in place by an annular block 24, the plunger 25 operating through such annular block to press the cap into sealing engagement with the mouth of the bottle.

While an apparatus for the carrying out of the method claimed, is shown and described with some particularity, no claim is made therefor in this application, as the same forms the subject-matter of an application filed April 10, 1909, Serial No. 489,112.

I claim herein as my invention:

1. As an improvement in the art of se-

curing flanged caps to bottles, the method herein described which consists in seating the cap on the bottle and bending the flange at intervals by pressure applied thereto and
 5 subjecting the flange to pressure in the direction lengthwise of the bottle and thereby forcing the bends into engagement with the bead on the bottle.

2. As an improvement in the art of securing flanged caps to bottles the method herein described which consists in seating the cap on the bottle and bending portions of the cap by pressure applied thereto and forcing such bent portions into engagement
 15 with the bead on the bottle by pressure applied at points intermediate of the bends.

3. As an improvement in the art of securing flanged caps to bottles the method herein described which consists in seating
 20 the cap on the bottle, bending the flange at intervals, and then forcing the bent portions into engagement with the bottle, the several steps being effected by pressure applied to the flange of the cap.

25 4. The method of closing a bottle or the like container having an annular exterior shoulder near the mouth thereof which consists in first placing over the bottle-mouth a cap having a substantially horizontally
 30 projecting edge-part, then bending downwardly into substantially straight form and substantially vertical disposition spaced portions of said edge-part of the cap each

extending substantially from the edge of said edge-part inwardly while leaving the
 35 remaining portions of said edge-part more or less as they were, and then displacing said edge-part inwardly, as to all portions thereof substantially uniformly, into locking contact under the shoulder on the bottle,
 40 substantially as described.

5. The method of closing a bottle or the like container having an annular exterior shoulder near the mouth thereof which consists in first placing over the bottle mouth
 45 a cap having a substantially horizontally projecting and substantially plain edge-part, then bending downwardly into substantially straight form and substantially vertical disposition spaced portions of said
 50 edge-part of the cap each extending substantially from the edge of said edge-part inwardly while leaving the remaining portions of said edge-part more or less as they were, and then displacing said edge-part
 55 inwardly, as to all portions thereof substantially uniformly, into locking contact under the shoulder on the bottle, substantially as described.

In testimony whereof, I have hereunto set my hand.

SAML. C. BOND.

Witnesses:

A. H. G. GARRETT,
 L. WEISCOFF.