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C. F. JENKINS.
BOTTLE CLOSING DEVICE.
APPLICATION FILED MAY 25, 1909.

Patented Apr. 5, 1910.

Fig. 1.

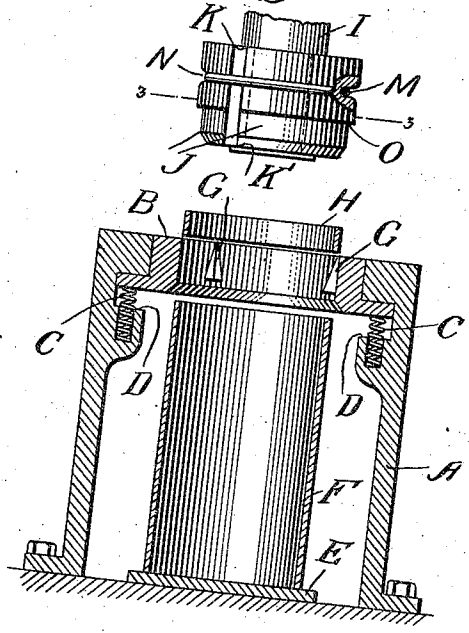


Fig. 2.

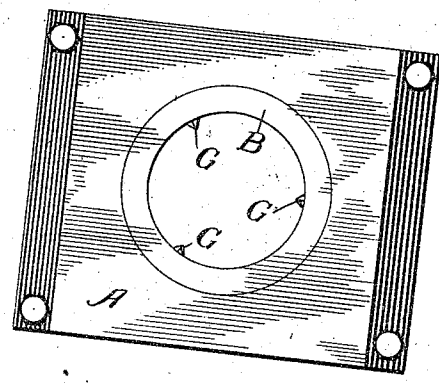


Fig. 3.

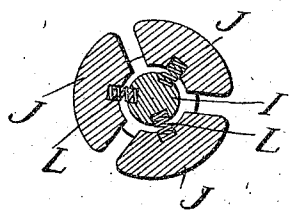


Fig. 4.

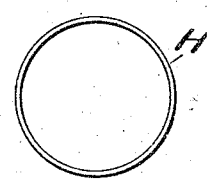


Fig. 5.

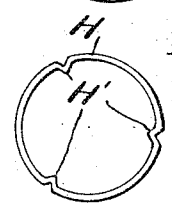
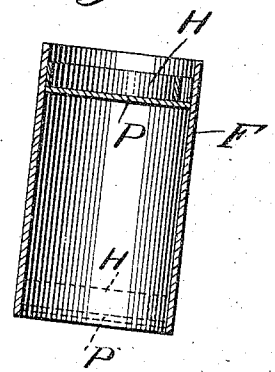


Fig. 6.



Witnesses
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UNITED STATES PATENT OFFICE.

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BOTTLE-CLOSING DEVICE.

954,109.

Specification of Letters Patent.

Patented Apr. 5, 1910.

Application filed May 25, 1909. Serial No. 498,124.

To all whom it may concern:

Be it known that I, CHARLES FRANCIS JENKINS, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Bottle-Closing Devices, of which the following is a specification, reference being had therein to the accompanying drawing.

In making complete paper bottles, it is common to form tubes of any desired uniform cross section, cut them into bottle lengths and insert closures or tops and bottoms. Usually the tubes are cylindrical, and, for many purposes, the most desirable closure is a disk of thin stock but to form a seat for such a closure usually involves expense which it is always desirable to avoid and which is in some cases prohibitory; and, further, many expedients are unsatisfactory on other grounds.

The principal object of this invention is to avoid these difficulties.

The desired end is attained by providing tubular rings too large to be inserted in the bottles and reducing their diameters by bending their walls sharply inward at various points to form hollow ribs and then inserting them in the bottles to serve as stops or shoulders for simple disk closures. Practically, the rings are formed without expense, by adding cutters to the devices which divide the bottle tubes into bottle lengths, and are automatically inserted by devices, herein shown, which are usually attached to the machine which automatically forms and inserts plane disks. No time is lost thereby, the ring being inserted in one bottle synchronously with the insertion of a disk in another bottle, and the ribs being formed by the ring inserting devices during their inserting movement. It may also be observed that the ribs so formed desirably increase the width of the disk supporting shoulder, and also serve in some cases for hinging and securing the closures.

In the accompanying drawings, Figure 1 is an elevation partly in axial section of a portion of a machine embodying my devices. Fig. 2 is a plan view of the lower portion of the mechanism seen in Fig. 1. Fig. 3 is a section on the line 3-3, Fig. 1. Fig. 4 is a plan view of a certain ring in initial form. Fig. 5 shows the same ring after it has been

operated upon by the novel devices. Fig. 6 shows in section a cylindrical bottle the body of which is seen in like section in Fig. 1.

In these drawings, A represents a frame supporting a vertically movable annular die B which is normally held in its highest position by springs C and limited in downward movement by shoulders D on the frame. At slightly more than a bottle's height below the plane of the lower face of the die is a support E for bottles F. The inner walls of the die are outwardly inclined below so that as it descends upon an alining bottle, resting upon the support, the open end of the bottle will be adjusted to exact position and form, when the die reaches the shoulders D. Above the inclined portion of the walls, the die is provided with inwardly projecting upwardly tapering lugs G shown as three in number and equidistant. The ring H to be inserted, shown in primary form in Fig. 4, may be of substantially the diameter of the interior of the upper part of the die, and when forced down through the same, by suitable devices, it will assume the form shown in Fig. 5, the lugs of the die pressing its wall inward to form ribs H' while the intermediate portions are drawn inward, which tends to lessen the diameter. If the parts be properly proportioned the ring will now enter and fit the interior of the bottle. The rings H are forced through the die by a reciprocating plunger consisting of a body portion I around the lower portion of which are arranged sections J at a short distance from each other so that they can pass between the lugs of the die, these sections forming a sort of sleeve about the body of the plunger and between shoulders K, K'. Each section is normally held away from the inclosed portion of the plunger body by one or more springs L, and the outward movement of all the sections is limited by one or more rings M lying in an annular groove or grooves N in the exterior of the sleeve as a whole. The lower end of the sleeve is preferably tapered and just above this tapered portion the sleeve is of such diameter as to fit the ring H in its primary condition. Above the place of such ring the sleeve has an annular shoulder of a width slightly less than the thickness of the ring H. The arrangement is such that the plun-

ger, die, and bottle are in alinement, with the plunger, when raised, more than a ring's width above the die. A ring H being placed in position over the die and adjusted, usually by automatic devices not shown, the descending plunger enters the ring and its shoulder engaging the upper edge of the same forces it down past the lugs which press it inward between the plunger sleeve sections, thereby forming the internal hollow ribs. During this operation the intermediate portions of the ring are drawn inward, the springs yielding and the sleeve sections moving bodily inward. The die meantime is forced down over the bottle and as the ring leaves the lugs it passes into the bottle, where it is left by the retreating plunger. Certain machines insert the disk closure P before the insertion of the ring as just described, while others insert it afterward, and obviously the last inserting plunger may have such stroke as to leave the ring and disk in either the upper or lower end of the bottle, as may be desired. The distance of the bottle below the raised die is small and practically no special devices are ordinarily required for stripping the bottle from the plunger, and hence in this instance none are shown.

What I claim is:

1. The combination with an annular die provided with rounded internal projections at intervals, of a co-acting reciprocating plunger having lateral recesses for said projections and a shoulder to engage a suitable ring and force it through the die; whereby said projections bend the ring into said recesses and thus provide it in turn with internal projections.

2. The combination with an annular die

provided at intervals with internal projections tapered toward the entrance face of the die, of a radially compressible co-acting reciprocating plunger having longitudinal external channels in registry with said projections and further having a shoulder adapted to engage the edge of a suitable ring, as the plunger advances toward the die, and force it through the latter; whereby the ring is passed into said channels by said projection, and thereby decreased in diameter.

3. The combination with a bottle support, of an annular die and a co-acting reciprocating plunger all alining; said plunger being adapted for radial compression and having a shoulder to engage one edge of a ring to be inserted in a bottle and further having at intervals external longitudinal channels; and said die having at corresponding intervals internal lugs tapered toward its entrance face.

4. The combination with a bottle support, of an annular spring supported forming die, parallel thereto, having internal tapered lugs at intervals, mounted at slightly more than a bottle's length above the support to move toward the support, means for limiting the movement of the die, and a co-acting reciprocating radially compressible plunger provided with external longitudinal channels registering with said lugs and with a shoulder adapted to engage the edge of a suitable ring and force it through the die into a bottle resting on said support.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES FRANCIS JENKINS.

Witnesses:

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