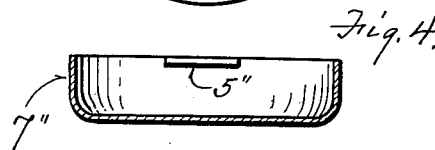
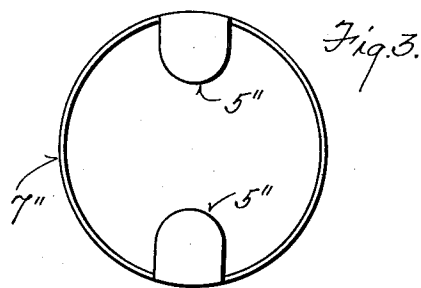
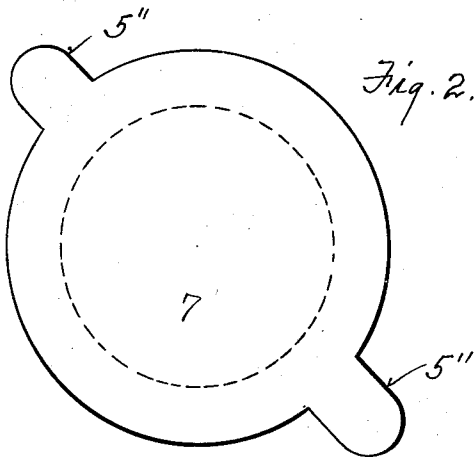


935,791.



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UNITED STATES PATENT OFFICE.

CHARLES FRANCIS JENKINS, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR, BY
MESNE ASSIGNMENTS, TO SINGLE SERVICE PACKAGE CORPORATION OF AMERICA,
A CORPORATION OF NEW JERSEY.

DIE FOR MAKING CLOSURES FOR PAPER BOTTLES.

935,791.

Specification of Letters Patent.

Patented Oct. 5, 1909.

Application filed October 19, 1907. Serial No. 398,292.

To all whom it may concern:

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

10 This invention relates to making cup-like bottle closures of paper or the like by turning up or drawing the marginal portions of plane paper disks having marginal ears or tabs, and it involves cutting out the disks, forcing
15 them in succession into one end of a long tube of less diameter than the disks, bending inward the tabs on each cap before the succeeding cap is pressed against it in the tube, and allowing each disk to force forward
20 as it enters the tube, all that precede it therein, whereby each in entering the filled tube causes one to be discharged from the opposite end after having been held in shape therein during the whole time needed for
25 forming a number of caps, depending upon the length of the tube. Practically in a rapidly working machine using dry, untreated stock, each cap is so quickly formed that the material has not time to set perfectly
30 in its new form unless it be held in shape after it is acted upon by the forming dies. This apparatus eliminates this difficulty without materially adding to the cost of the product.

35 In the accompanying drawings, Figure 1 is a section of the apparatus, the plane of section passing through the common axis of the cutting and forming dies. Fig. 2 is a plan view of an undrawn blank. Fig. 3 is a
40 plan view of a completed cap. Fig. 4 is a diametrical section of the cap of Fig. 3.

In these figures, 1 represents a heavy bed plate supported by members 2 and provided with a central cylindrical opening A. An
45 annular forming die B is fixed to the upper side of the bed plate and into the lower side of the latter is screwed a tube 4, the interior of the tube, the bed plate opening and the die opening forming a continuous cylindrical
50 passage, of uniform diameter, capable of holding many formed and superposed caps. Surrounding, and at some distance from, said die opening is a cutting die 3, shown as integral with the forming die and above

its plane. With this cutting die coöperates 55 a hollow reciprocating cutting plunger 5 of cylindrical form but provided with lateral projections 5' for forming tabs. This cutting die and plunger cut from a sheet S, of stock, disks 7 provided with tabs 5'' (Fig. 60 2), and each disk is then struck centrally by a reciprocating forming plunger 6 and forced into the forming die B and thereby drawn into the form of a cup 7', 7'' having the tabs at its upturned margin, and is
65 pushed downward to a short distance into the cylindrical passage after it is formed. As it thus descends it strikes the beveled ends of transverse sliding bars 9, pushing them outward, and advances until the plane 70 of its margin is slightly below the plane of the bars, which lie in the vertical plane of the tabs. The plunger then recedes and as soon as it ceases to support the tabs the latter are bent inward by the bars which
75 are moved inward by springs 9' and which are limited in such movement by stops 9''. When the plunger again descends with a second cap, the inwardly bent tabs are pushed downward until the second cap rests 80 firmly upon the first, the air between the two escaping quickly through large lateral passages 8, before it can materially spring the plane body of the cap below, and the first cap while frictionally engaged by the tube 85 walls is advanced through a distance equal to its own height. This entire operation is repeated indefinitely, each cap as it enters pushing forward all that are below it in the tube, and when the tube has been filled 90 with superposed caps they are all advanced step by step and discharged in succession at the lower end of the tube. Each discharged cap is thus held in exactly the form given it by the dies and bars 9 during the time re- 95 quired to form as many caps as the tubular passage will contain, and if the tube be of proper length for the kind of stock used, this interval is sufficient to allow so complete setting or readjustment of the fibers that no
100 material change in form follows the discharge of the caps from the passage in which they are temporarily held.

I do not wish to limit myself to the precise construction shown, but 105

What I claim is:

1. In devices of the class described, the combination with an annular die having a

registering tubular extension, of a reciprocating plunger arranged to co-act with the die in forming cup-like caps and to force them successively into said extension, the
 5 wall inclosing the path of the formed caps being provided with a passage allowing the escape of air below the cap-forming point and immediately above the point at which the retreating plunger leaves each cap.

10 2. In cap forming dies, the combination of a tubular die and a forming plunger co-acting therewith, to turn up the marginal portion of a tabbed paper disk, forming an integral flange, of automatic means for bending inward tabs upon the upturned flange
 15 after the retreat of the plunger, whereby the tabs lie folded beneath the succeeding disk forced into the die by the plunger.

20 3. The combination with a reciprocating forming plunger and a reciprocating cutting plunger inclosing the same, of a fixed forming die and a fixed cutting die co-acting, respectively, with said plungers, a tube registering with the forming die to receive there-
 25 from and hold in their new form a series of caps, yieldingly held bars normally pro-

jecting laterally into the path of the formed caps, and means for forcing the bars inward after each cap passes, whereby ears upon the caps are folded inward.

30 4. The combination with the die supporting plate having a cylindrical opening, of the forming die having an equal opening registering with the plate opening, the tube having its internal diameter equal to that
 35 of said openings and forming with them a single uniform passage, the transverse spring-pressed sliding bars normally projecting into said passage at a short distance from its upper end, and a reciprocating
 40 forming plunger arranged with its axis in the line of the axis of the passage, to carry disks into said passage, forming or drawing them and releasing them at a point just
 45 below said bars.

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

CHARLES FRANCIS JENKINS.

Witnesses:

L. B. SELBY,
 FRANCIS S. MAGUIRE.