

C. F. JENKINS.
 APPARATUS FOR FORMING AND INSERTING RECEPTACLE CLOSURES.
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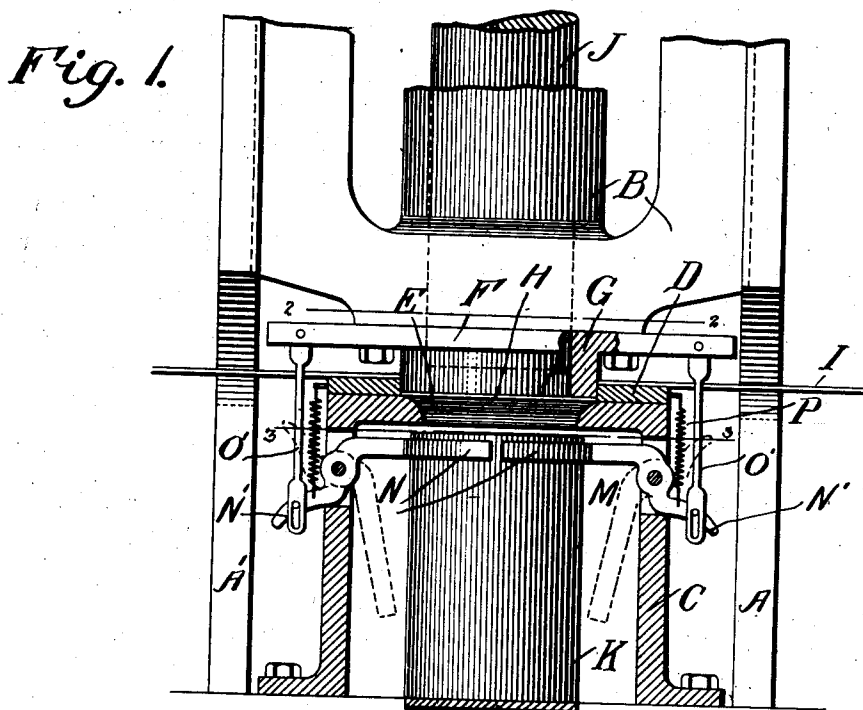
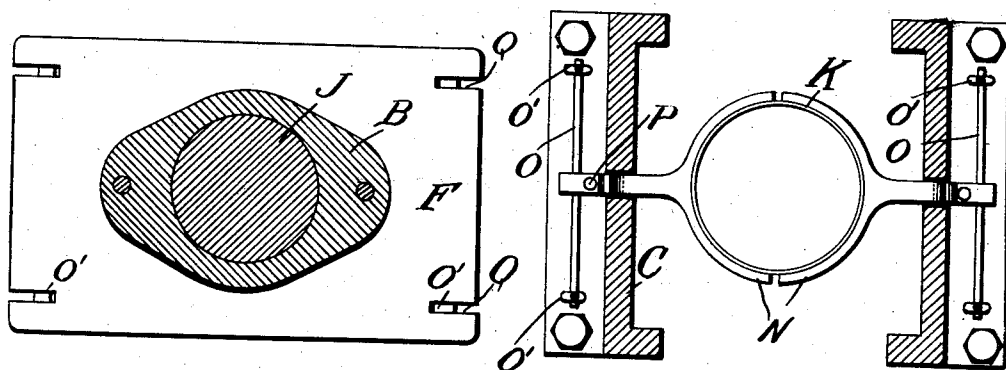


Fig. 2.

Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR FORMING AND INSERTING RECEPTACLE-CLOSURES.

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Specification of Letters Patent.

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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 Apparatus for Forming and Inserting Receptacle-Closures, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to apparatus for forming closures and inserting them in receptacles, and is especially intended for forming cup-like closing disks and inserting them in flexible receptacles for containing milk or other liquid or solid goods. For illustration, the apparatus chosen is such as is adapted for cutting disks from paper stock, shaping or drawing them to the form of shallow cups and forcing them directly into cylindrical paper bottles (by the action of a plunger which first co-acts with an annular die in drawing them into proper shape) without releasing them or giving them an opportunity to spring out of exact form given them by the forming devices. In such apparatus, it is essential that the bottle body, being readily crushed, shall be held in exact position and in exact form at the instant when insertion begins. Usually bottle bodies are presented automatically in rapid succession, each resting for an instant to receive its closure and then moving on to give place to the next. Rapidity of operation is practically indispensable in this particular art, and difficulty has been found in adjusting the bottle body to exact form and exact position during its momentary rest, and instantly releasing it before it is moved onward. It is also to be noted that the difficulties where paper is used are much greater than in using metal. Whatever the material, the difficulties are overcome in placing the bottle so near the closure forming devices that the closure is partly inserted before it is completely formed, and in providing simple bottle adjusting devices which are compelled to act synchronously with the inserting plunger, so that the bottle is necessarily held precisely in form and position during the proper interval, and no longer, whatever the speed of operation.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of so

much of the machine as is needed to illustrate the construction and action of the novel devices. Fig. 2 is a section on the line 2—2, Fig. 1. Fig. 3 is a section on the line 3—3, Fig. 1.

In these views, A, A' represent uprights provided with vertical ways for a reciprocating cross-head B, C a support for an annular cutting die plate D and a smaller concentric forming die E. The crosshead carries a plate F provided with a hollow cutting plunger G adapted to cut plane disks H from paper stock I, placed upon the die D in any suitable manner. Within the plunger G reciprocates a differently timed forming and inserting plunger J. The bottle K to be closed is brought to rest below the plungers and is supported with its open end just below the die E by any suitable device, for example, by a plate L of an intermittently moving feed chain, not otherwise shown. Centrally pivoted at M in the support C, upon opposite sides respectively, of the bottle are adjusting jaws N, each having its inner end adapted to fit one side or half of a cylindrical bottle of the size used. These jaws assume the position shown in dotted lines when the cutting plunger is in raised position, leaving the bottle free to move bodily between them. Through the outwardly projecting end portion N' of each jaw is passed a rod O, and the end portions of each rod lie, respectively, in slots in the lower portions of bars O', the upper ends of which are pivoted to the plate carried by the crosshead, as shown in slots Q. The parts are so proportioned that when the cutting plunger nears the lower limit of its movement, the rods O, lying then in the upper ends of the slots, are suddenly forced downward swinging the jaws to the positions shown in full lines. The bottle end is thus suddenly grasped, pressed into true cylindrical form and accurately held in registry with the plunger J, which instantly descends forming the disk into a cup and inserting it in the bottle, the lower part of the flanged closure or cup being inserted before the upper portion of the flange leaves the forming die. The plungers then rise, releasing the jaws which fall to initial position, the falling being accelerated if desired by springs P.

Obviously the action of the jaws or adjust-

ers would be the same whether or not the inserted closures be cup-like, and it is also evident that they may be actuated differently without departing from this part of my invention, so long as they are compelled to act synchronously with the inserting device. It is also plain that it is optional whether the bottles be circular in cross section if the jaws or adjusters correspond in form with the selected cross section; and indeed the jaws permit the use of certain non-cylindrical forms not otherwise practically available.

What I claim is:

1. The combination with a reciprocating forming and inserting plunger, of an annular die adapted to co-act therewith in forming a closure, an alining support for a pliable receptacle, normally disengaged receptacle-forming jaws arranged to grasp the end of such receptacle and press it into shape and position near said die, and automatic means for actuating said jaws as the plunger makes its inserting advance.
2. The combination with a reciprocating closure inserting plunger, of an annular co-acting forming die fixed in the path of the plunger, an alining support for a flexible bottle, jaws arranged to be moved into and out of position for pressing the open end of

such bottle into exact conformity with the shape of the closure to be inserted therein by the plunger, and means whereby the inserting advance of the plunger moves said jaws into bottle-shaping position alongside said die, substantially as set forth.

3. In apparatus of the class described, the combination with an annular forming die, of a larger concentric cutting die above the same, a reciprocating forming and inserting plunger arranged to co-act with the forming die, a reciprocating sleeve-like cutting plunger encircling the forming plunger and adapted to co-act with said cutting die in forming a disk from stock placed upon the latter, a receptacle support in the line of the forming plunger's advance, receptacle forming jaws normally at some distance from the place of said receptacle and upon opposite sides thereof, and automatic means for compelling said jaws to seize and adjust the open end of a receptacle upon said support an instant before insertion of the closure by the forming and inserting plunger.

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

CHARLES FRANCIS JENKINS.

Witnesses:

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