G. W. BEADLE.

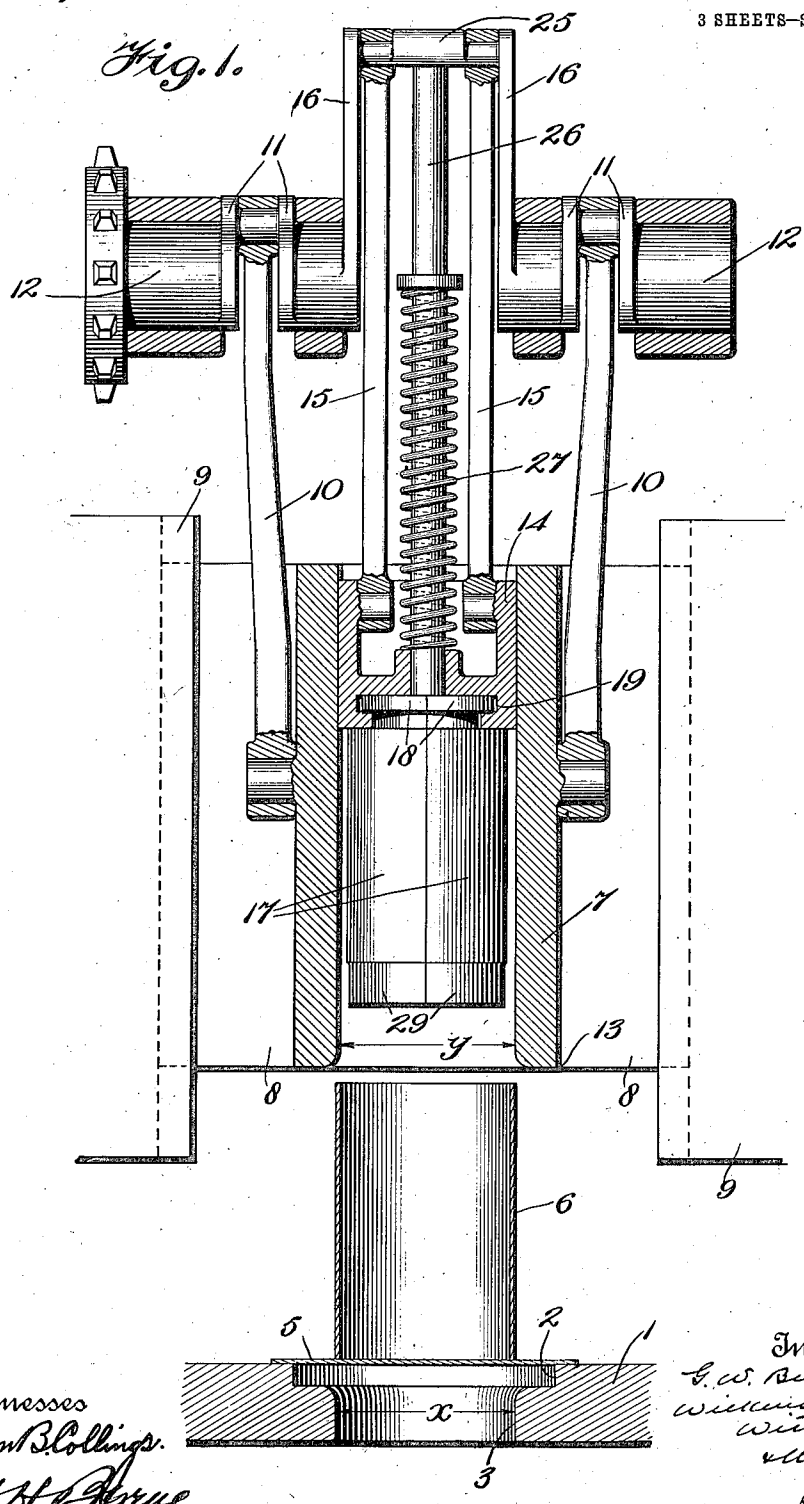
MACHINE FOR AUTOMATICALLY CAPPING CARTONS.

APPLICATION FILED DEC. 16, 1912.

1,125,043. Patented Jan. 19, 1915.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses
Byron B. Collings.
W. N. Byrne

Inventor
G. W. Beadle by
Williamson Witherspoon
& Macleay
Attorneys.

G. W. BEADLE.

MACHINE FOR AUTOMATICALLY CAPPING CARTONS.

APPLICATION FILED DEC. 16, 1912.

1,125,043. Patented Jan. 19, 1915.

3 SHEETS—SHEET 2.

Fig. 2.

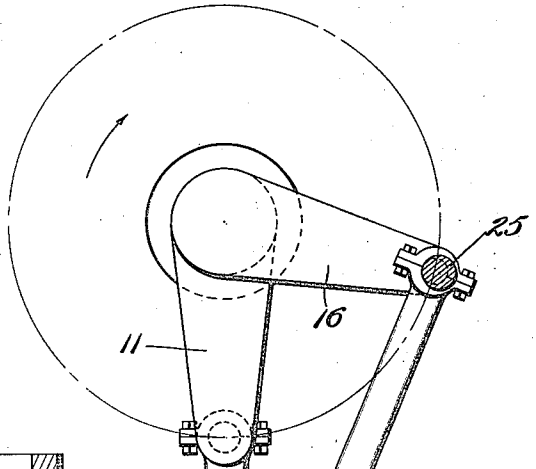
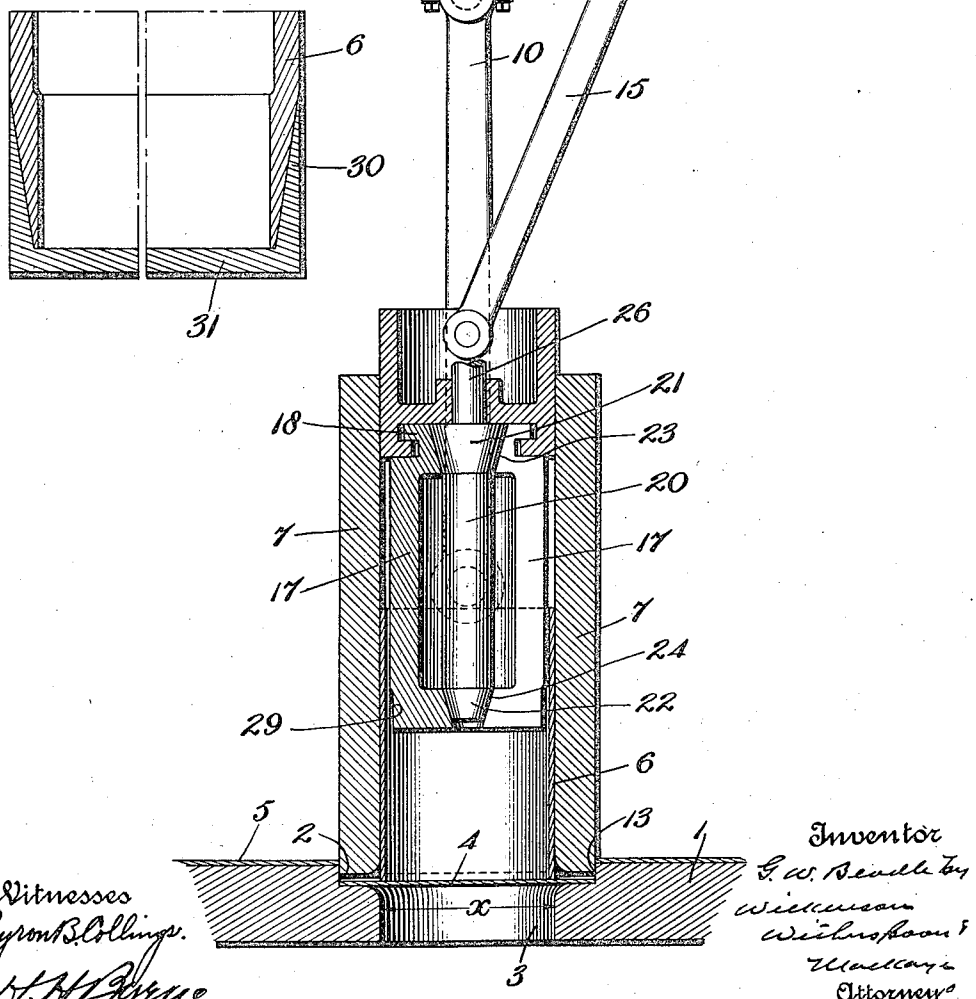


Fig. 4.



Witnesses
Byron B. Collings.
W. A. Greene

Inventor
G. W. Beadle by
Wilkinson Wilkinson & Wallace
Attorneys

G. W. BEADLE.

MACHINE FOR AUTOMATICALLY CAPPING CARTONS.

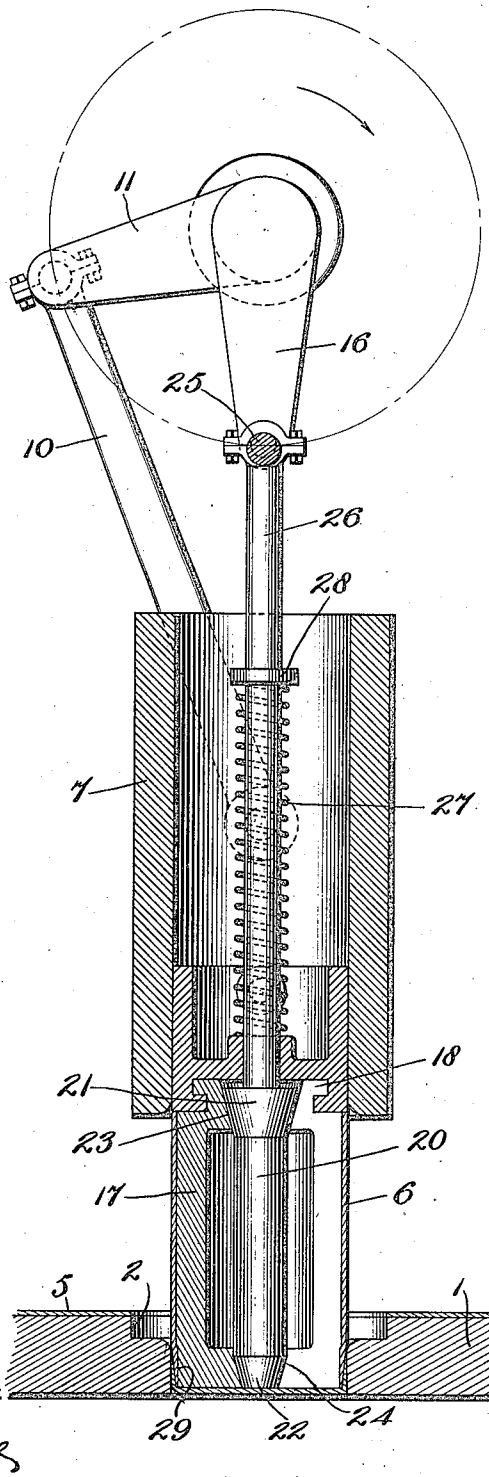
APPLICATION FILED DEC. 16, 1912.

1,125,043.

Patented Jan. 19, 1915.

3 SHEETS—SHEET 3.

Fig. 3.



Witnesses
Byron B. Collings.
H. A. Bynes

Inventor
G. W. Beadle by
Wilkinson
Wilkinson &
MacCaye
Attorneys

UNITED STATES PATENT OFFICE.

GEORGE W. BEADLE, OF BAYONNE, NEW JERSEY, ASSIGNOR TO SINGLE SERVICE PACKAGE CORPORATION OF AMERICA, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

MACHINE FOR AUTOMATICALLY CAPPING CARTONS.

1,125,043. Specification of Letters Patent. Patented Jan. 19, 1915.

Application filed December 16, 1912. Serial No. 737,148.

To all whom it may concern:

Be it known that I, GEORGE W. BEADLE, a citizen of the United States, residing at Bayonne, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Machines for Automatically Capping Cartons; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to a machine for applying slip closures to paper cartons, and has for one of its objects to provide a means which will expeditiously and efficiently form the closures and affix the same to the carton body in a single operation.

This invention constitutes a modification of the machine constructed for the same purpose and disclosed in my co-pending application for U. S. Patent, Serial No. 732397, dated November 19, 1912.

With these and other objects in view the invention consists in the novel details of construction and combinations of parts more fully hereinafter disclosed and particularly pointed out in the claims.

Referring to the accompanying drawings forming a part of this specification in which like numerals designate like parts in all the views:—Figure 1 is a diagrammatic view in section of the machine, showing the position of the parts immediately before the operation; Fig. 2 is a similar view taken at right angles to Fig. 1, and showing the parts at the time of the formation of the disk; Fig. 3 is a view similar to Fig. 2, and showing the parts on the completion of the closure forming and affixing operation; and, Fig. 4 is a central sectional view illustrating the joint between the cap and carton body.

Referring to the construction in detail, the apparatus consists of a base plate 1, providing a depression 2 and an orifice 3, constituting a forming die.

A sheet or strip 5 is fed, in any suitable manner, over the plate 1, and the carton bodies 6 to which the closures are to be applied, may be supported on said strip in the manner shown in Fig. 1 immediately beneath the closure affixing mechanism. This closure affixing mechanism consists of a movable cutting die or hollow cylinder 7, which may be mounted on a cross head 8, sliding within the guide-ways 9, secured to the frame of the machine. Said cutting die is connected to a pair of pitmans 10, that are operated by the cranks 11 of the shaft 12, which shaft is adapted to be driven from any suitable source.

The lower edge 13 of the punch or die 7 coöperates with the forming die to cut the disk 4 from the sheet, while on its downward movement the hollow body of the said die 7 is adapted to receive the carton body 6, as in the manner shown in Fig. 2.

A plunger 14 fits closely within the chamber of the punch or die 7, and is adapted to be operated therein through the medium of a pair of pitmans 15 that connect with the cranks 16 of the shaft 12. Said plunger 14 carries an expansible forming plunger comprising independent segmental sections 17 constructed to provide a collar 18 that fits within an annular recess 19, formed in said plunger 14. The annular recess 19 is of such dimensions as will allow of the sections 17 of the expansible forming plunger being moved radially outward or expanded, as will be presently explained.

The diameter of the expansible former, when in its contracted position, is slightly less than the interior diameter of the carton body 6; to the end that the said forming plunger may readily enter said carton, and that the wall of said carton body may readily fit within the annular space between the hollow cutting die 7 and said expansible forming plunger, as clearly shown in Fig. 2.

The expansible plunger is expanded through the medium of a core 20, having cam elements, or spreaders, 21 and 22, which engage respectively with complementary surfaces 23 and 24 formed on the upper and lower ends of the expansible plunger sections 17. The expanding core is adapted to be actuated as the forming plunger approaches its lowermost position, as through the medium of an eccentric 25 on the crank shaft 16, which may contact with the rod 26, carried by the core 20. A spring 27 is mounted on the rod 26, and has its respective ends seated against a collar 28, formed on said rod, and the plunger 14 through which the rod loosely passes. Said spring has for its purpose to move the core relatively to the expansible forming plunger to allow of contraction of the members 17, and

to permit of the forming plunger being readily withdrawn from the carton body.

The lower end of the expansible plunger is annularly cut away, or reduced, as shown at 29 (Fig. 1), to accommodate the displaced material of the carton body when the closure is applied, as clearly shown in Fig. 3, during the operation of affixing by compression the flanges 30 of the closure 31 to the carton body 6, as shown in Fig. 4.

The diameter X of the orifice 3, where the carton closure is formed, is slightly less than the interior diameter Y of the movable cutting die 7, thereby causing the closure, or cap, to be compressed or squeezed onto the carton body when the forming plunger is expanded by the core 20. At this period of the operation of the machine, the several parts are in substantially the position shown in Fig. 3.

The operation of the machine is as follows:—

First, the carton body, which is simply a tube open at both ends, is placed beneath the hollow punch 7, which punch has been raised to a height sufficient to allow of the carton being placed in this position. The punch 7 and the forming plunger then descend, the punch being slightly in advance, so that the first operation is to inclose the carton body and cut the paper 5 into a disk 4, whose diameter is larger than that of the paper tube, in order that there may be stock out of which to form the flange of the cap or closure.

Second, the forming plunger and the plunger 14 continue their downward stroke when the forming plunger engages the disk 4 and forces the same through the orifice 3, thereby shaping said disk into a cap or closure surrounding the end of the carton body. On account of the heavy pressure occasioned by the fact that the said diameter X is a little smaller than the outer diameter Y of the carton body, the cap is compressed or squeezed firmly onto the carton and causes the package or carton with applied closure to be of a uniform external diameter throughout, as illustrated.

Third, on the return stroke of the press, the plungers leave the carton, while the forming plunger is contracted to prevent binding. A new carton is then inserted, and the cycle above described repeated.

The paper which is used in this operation, in order to facilitate the flow of its particles, may be either previously moistened, as with steam, or it may be treated with paraffin.

It is obvious that those skilled in the art may vary the details of construction and arrangement of parts without departing from the spirit of my invention, and therefore I do not wish to be limited to such features, except as may be required by the claims.

What I claim is:—

1. In a carton capping machine, the combination of a hollow reciprocating cutting plunger; an expansible forming plunger adapted to reciprocate in the hollow of said cutting plunger having an outer diameter, when in its expanded condition, adapted to leave an annular space for the accommodation of a carton body; and a forming die over which paper may be fed associated with said plungers, having a diameter slightly less than the interior diameter of said cutting plunger, but greater than the said outer diameter of said forming plunger, substantially as described.

2. In a carton capping machine, the combination of a hollow reciprocating cutting plunger; an expansible forming plunger provided with a reduced portion at its forming end, adapted to reciprocate in the hollow of said cutting plunger, and having an outer diameter, when in its expanded condition, adapted to leave an annular space for the accommodation of a carton body; and a forming die over which paper may be fed associated with said plungers, having a diameter slightly less than the interior diameter of said cutting plunger, but greater than the said outer diameter of said forming plunger, substantially as described.

3. In a carton capping machine, the combination of a hollow reciprocating cutting plunger adapted to receive on its interior the carton body to be capped; an expansible forming plunger adapted to reciprocate inside said carton body after it is received by said cutting plunger; and a forming die over which paper may be fed having a diameter substantially equal to the outer diameter of said carton, substantially as described.

4. In a carton capping machine, the combination of a hollow reciprocating cutting plunger adapted to cut a disk of paper out of which said caps are to be formed, and to receive on its interior the carton body to be capped; an expansible forming plunger adapted to reciprocate inside said carton body after it is received by said cutting plunger; means to expand said forming plunger after said disk has been cut; and a forming die over which paper may be fed having a diameter substantially equal to the outer diameter of said carton body, substantially as described.

5. In a carton capping machine, the combination of a hollow reciprocating cutting plunger adapted to receive on its interior the carton body to be capped; an expansible forming plunger having a reduced forming end, and adapted to reciprocate inside said carton body after it is received by said cutting plunger; means for expanding said forming plunger just before it finishes its forming stroke; and a forming die over which paper may be fed having a diameter

substantially equal to the outer diameter of said carton body, substantially as described.

6. In a carton capping machine, the combination of a hollow cutting plunger adapted to receive on its interior the carton body to be capped; a crank and connections for reciprocating said plunger; a forming plunger adapted to enter said cutting plunger and carton body; a crank and connections for reciprocating said forming plunger; and a forming die over which paper may be fed coacting with said plungers and having a diameter substantially equal to the outer diameter of said carton body, substantially as described.

7. In a carton capping machine, the combination of a hollow cutting plunger, adapted to receive on its interior the carton body to be capped; a crank and connections for reciprocating said plunger; a forming plunger adapted to enter said cutting plunger and carton body; a crank and connections for reciprocating said forming plunger; and a forming die over which paper may be fed coacting with said plungers provided with a depression into which a paper disk formed by said cutting plunger may be forced, and having a diameter substantially equal to the outer diameter of said carton body, substantially as described.

8. In a carton capping machine, the combination of a hollow cutting plunger adapted to receive on its interior the carton body to be capped; a crank and connections for reciprocating said plunger; an expansible forming plunger adapted to enter said cutting plunger and carton body; a crank and connections for reciprocating said forming plunger; a reciprocating core for expanding said forming plunger; and a forming die over which paper may be fed coacting with said plungers and having a diameter substantially equal to the outer diameter of said carton body, substantially as described.

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

GEORGE W. BEADLE.

Witnesses:
H. H. RODGERS,
J. H. GEWECKE.