G. W. BEADLE.

MACHINE FOR CAPPING CARTONS.

APPLICATION FILED NOV. 19, 1912.

1,133,426.

Patented Mar. 30, 1915.

3 SHEETS—SHEET 1.

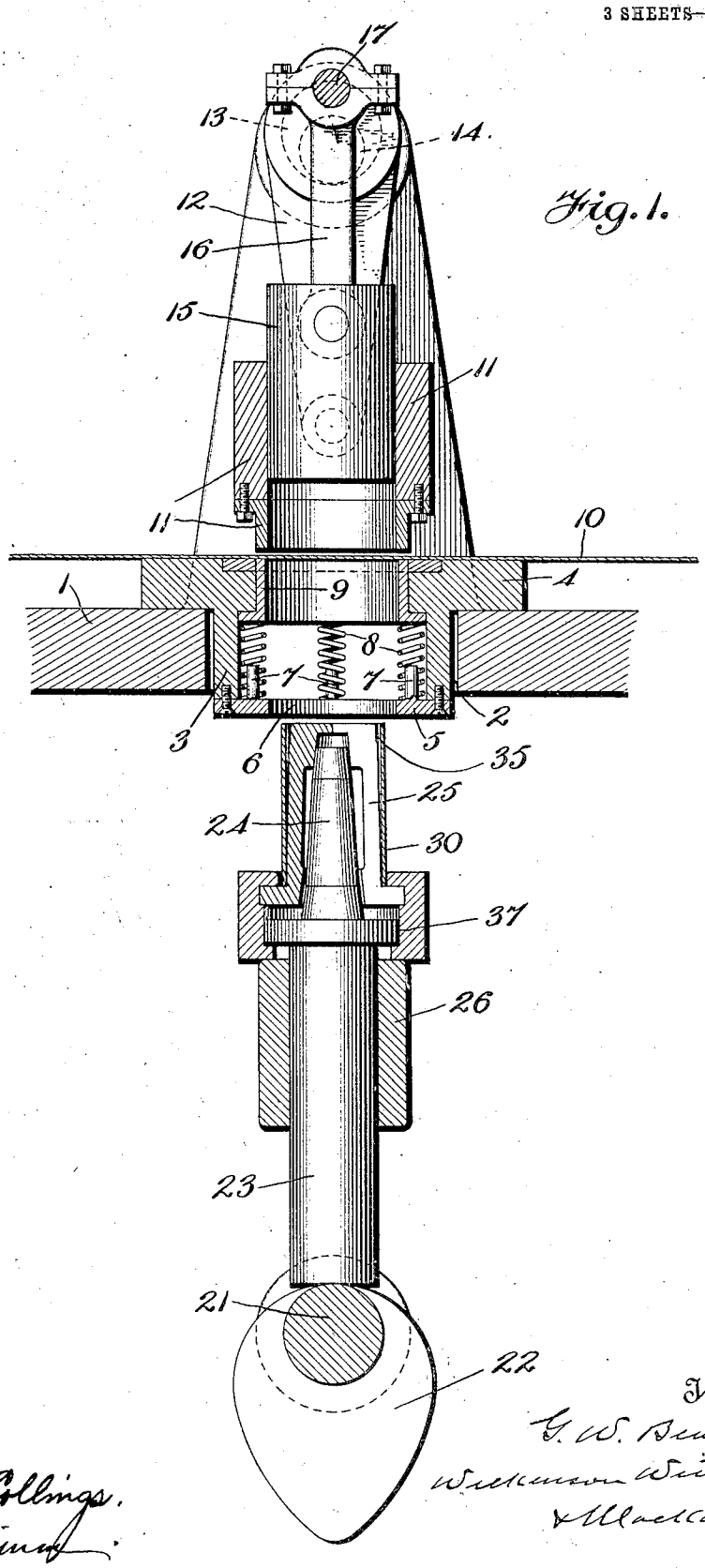


Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 2.

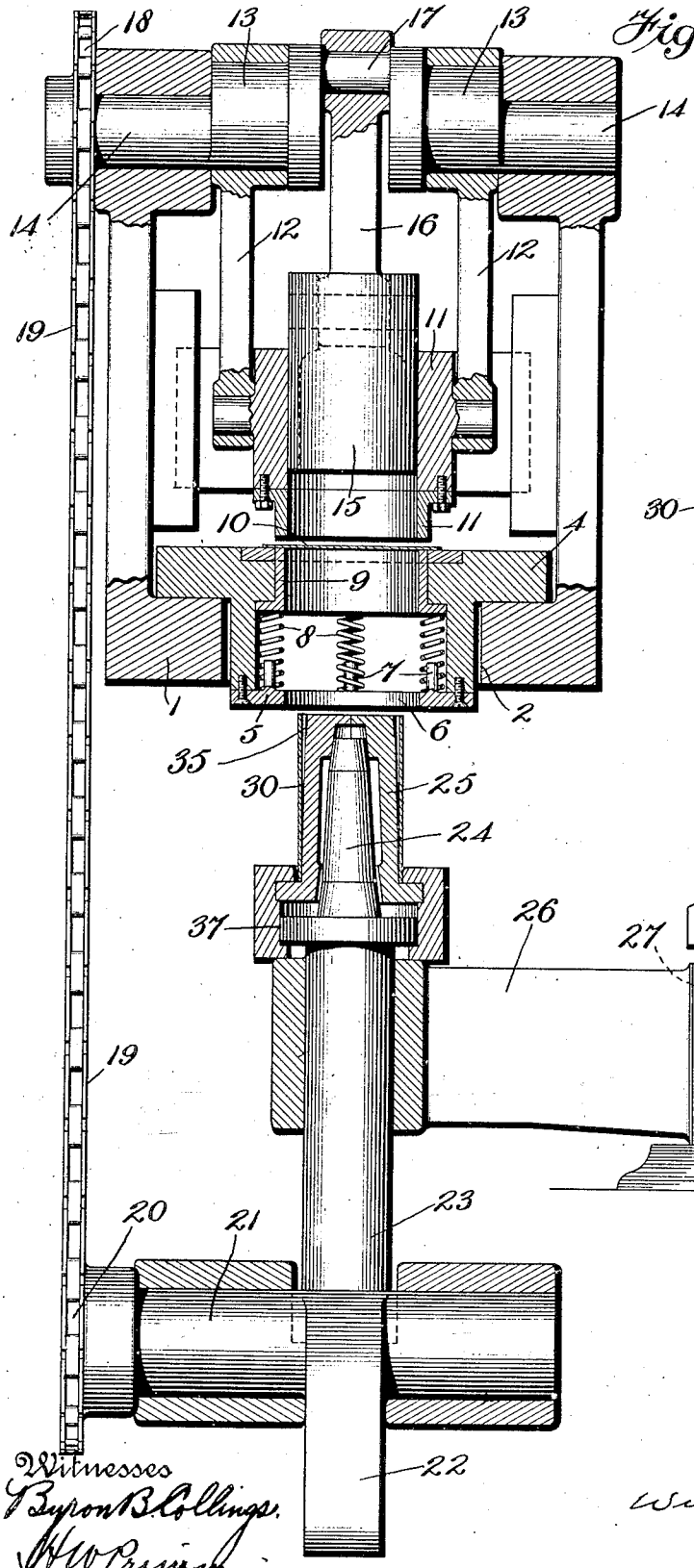
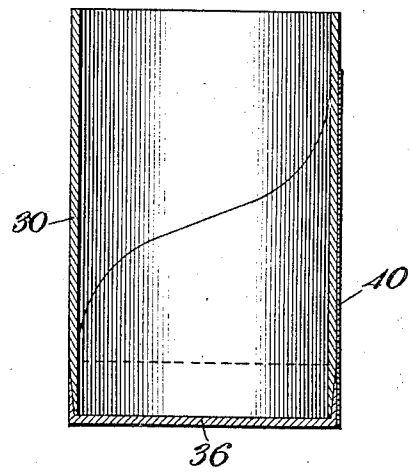
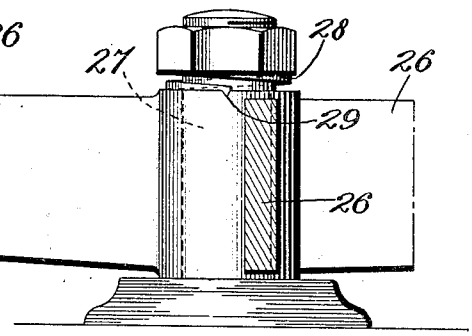


Fig. 4.





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3 SHEETS—SHEET 3.

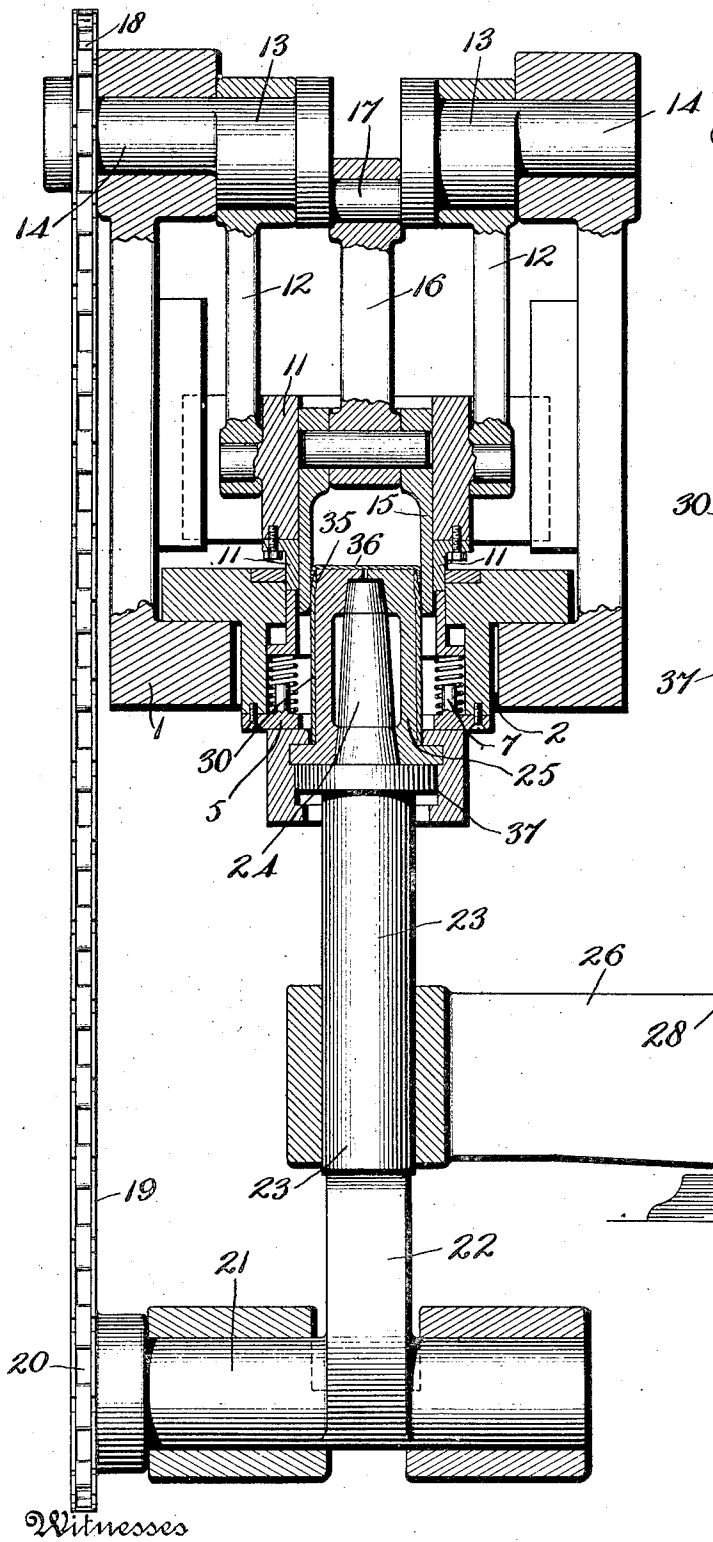
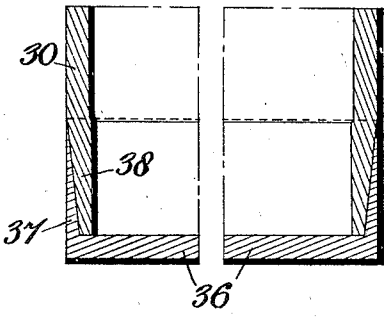
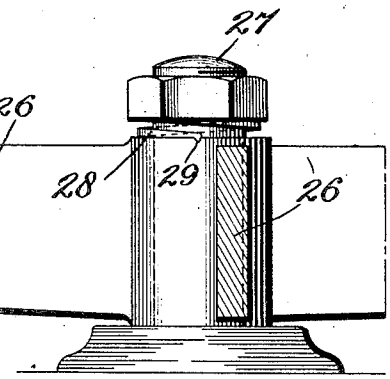


Fig. 3.

Fig. 5.





Witnesses

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UNITED STATES PATENT OFFICE.

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MACHINE FOR CAPPING CARTONS.

1,133,426. Specification of Letters Patent. Patented Mar. 30, 1915.

Application filed November 19, 1912. Serial No. 732,397.

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 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.

This invention relates to a machine for applying slip closures to paper cartons, and has for its object to provide a means which will form the closures and fit them to the carton body in a manner more expeditious and more efficient than has been heretofore proposed.

To these ends 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 a mechanism illustrating my invention, and showing the position of the parts immediately before the carton carrying mandrel is elevated; Fig. 2 is a view similar to Fig. 1, but showing the parts from a direction at right angles to that from which Fig. 1 is taken; Fig. 3 is a view similar to Fig. 2, but showing the position of the parts after the cap has been applied to the carton; Fig. 4 is a sectional view of a carton after the cap has been applied with my machine; and, Fig. 5 is an enlarged detail view showing the joint made between the cap and the carton body.

1 indicates any suitable bed plate provided with an orifice 2 into which fits the portion 3 of the paper carrying die 4, and 5 indicates a cap secured to the said portion 3, provided with the orifice 6, and with the guide pins 7 surrounded by the springs 8, as shown. On the upper end of the springs 8 rests the sliding sleeve 9, the upper edge of which comes flush with the upper edge of the die 4, as shown. Passing over the die 4 is the paper 10 from which the caps are to be made and coacting with the said die 4 is the cutting plunger 11 operated by the connecting rods 12, coacting with the eccentrics 13 carried by the operated shaft 14. The said cutting plunger 11 is hollow, as shown, and fitting therein is the forming die 15 operated by the connecting rods 16, coacting with the crank pin 17 also carried by the shaft 14. The said shaft 14 is further provided with the sprocket wheel 18 over which passes the chain 19, and operated by said chain is the sprocket 20 connected to the shaft 21 carrying the cam 22, coacting with the movable mandrel extension or stem 23, provided with the expanding core 24, over which fits the expanding members of the mandrel 25. The said mandrel extension 23 is carried by the swinging arms 26 pivoted on the stud 27, carrying the detent means 28 adapted to fit in notches 29 in the hub of the arm 26.

There are a plurality of arms 26, three being shown in the drawings, and each carry mandrels 25 and mandrel stems 23, not shown. Further, these said arms 26 and mandrels may be rotated by hand, or by any other means, so as to bring each mandrel 25 successively in register with the orifice 6 of the die plate 4, and when said mandrels are thus in register, the detent 28 holds them firmly in place.

30 represents carton bodies which are slipped over each of the mandrels employed.

The operation of my machine is as follows:—Power being applied to the shaft 14, the cutting plunger 11 descends and cuts out a disk from the paper 10, which disk is forced into the die 4, and rests upon the upper edge of the spring controlled sleeve 9. The continued rotation of the shaft 14 next brings the forming plunger 15 into contact with the disk, and as the outer diameter of the said forming plunger is less than the inner diameter of the sleeve 9, it passes into said sleeve. The parts are so timed that when the forming plunger reaches the disk, the mandrel 25, carrying the carton 30, also reaches the disk. The interior diameter of the forming plunger 15 is the same as the exterior diameter of the carton 30, and the mandrel 25 is provided with a slight depression 35 at its extreme upper end, so as to accommodate, when in its expanded condition, the thickness of the disk or closure 36, as will be clear from Fig. 3. The parts are further so proportioned that the lifting of the mandrel 25 into contact with the disk is not sufficient to expand the said mandrel, and consequently, as the forming plunger

15 continues to descend and the mandrel 25 to ascend, the said closure 36 will pass inside the beveled lower end 37 of the forming plunger 15, and the material of the said closure will consequently be formed into the shape of a cap. To facilitate this formation, which necessitates a greater or less flow of the paper material, the said material may be either previously moistened, as with steam, or it may be treated with paraffin. If the cap, however, is made of a very high grade of paper, and if its dimensions are not too great, the particles of the paper will adjust themselves, without further treatment, to the form of the cap. In ordinary cases, however, I prefer to either moisten the paper, or to paraffin the same. As the forming plunger 15 continues to descend, and the mandrel 25 continues to ascend, the core 24 of the mandrel expands the said mandrel, and consequently forces the turned over lip 37 of the cap 36 into the extreme end portion 38 of the carton body, and forms a joint like that shown in Fig. 5. That is to say, the turned over lip 37 is tapered, or more or less wedge-shaped, as indicated, while the extreme end 38 of the carton 30 is likewise more or less tapered, as shown. It results from this, that an exceedingly tight cap closure is provided, which cannot be removed accidentally, and which maintains its tight joint under all conditions of use. Further, the outer diameter of the flange 37 and the body portion of the carton 30, being the same, a flush surface is provided, which renders it possible for these cartons to be labeled in an ordinary labeling machine without any difficulty at all. In other words, the labels, such as 40 indicated in Fig. 4, can be applied flush with the ends of the package, in the regular labeling machines, and no complications are experienced at all, which is not the case when the cap is of a larger diameter than the carton body. It is therefore an important feature of my invention that the interior diameter of the hollow forming plunger 15 is of the same size as the exterior of the finished carton. It is further an important feature of my invention that the material of the cap is caused to flow, as indicated, because it makes an exceedingly tight joint between a paper body portion and a flanged paper cap portion, which is a very difficult problem to solve.

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

What I claim is:—

1. In a carton capping machine, the combination of a cutting plunger; a hollow forming plunger having an interior diameter equal to the exterior diameter of the carton body to be closed; an expansible mandrel carrying said carton body; means for causing a relative movement between said mandrel and forming plunger; and means for expanding said mandrel, substantially as described.

2. In a carton capping machine, the combination of a reciprocating cutting plunger; a reciprocating hollow forming plunger having an interior diameter equal to the exterior diameter of the carton body to be closed; an expansible mandrel carrying said carton body; means for causing a relative reciprocating movement between said mandrel and forming plunger; and reciprocating means for expanding said mandrel, substantially as described.

3. In a carton capping machine, the combination of a reciprocating cutting plunger; a reciprocating sleeve coacting with said plunger; a forming plunger adapted to form cap closures having exterior diameters of substantially the same dimensions as the exterior diameter of the carton body to be closed; and an expansible mandrel adapted to carry a carton coacting with said forming plunger, substantially as described.

4. In a carton capping machine, the combination of a reciprocating cutting plunger; a reciprocating sleeve coacting with said plunger; a hollow forming plunger adapted to form cap closures having exterior diameters of substantially the same dimensions as the exterior diameter of the carton body to be closed; an expansible mandrel adapted to carry a carton coacting with said forming plunger; and means to move said mandrel and carton into the hollow of said forming plunger, substantially as described.

5. In a carton capping machine, the combination of a reciprocating cutting plunger; a reciprocating sleeve coacting with said plunger; a forming plunger adapted to form cap closures having exterior diameters of substantially the same dimensions as the exterior diameter of the carton body to be closed; an expansible mandrel adapted to carry a carton coacting with said forming plunger; means on which said mandrel is pivoted for movement into and out of register with said forming plunger; and means for moving said mandrel toward said forming plunger when said mandrel and plunger are in register, substantially as described.

6. In a paper carton capping machine, the combination of a cutting plunger; means for reciprocating said plunger; a spring controlled sleeve adapted to hold the material cut by said plunger and to be depressed by the latter; a hollow forming plunger adapted to reciprocate inside said sleeve and having an interior diameter of a size to closely fit the carton body to be capped; a mandrel adapted to carry a carton and to reciprocate

in the hollow of said forming plunger; and pivotal means enabling said mandrel and carton to be moved into and out of register with said forming plunger, substantially as described.

7. In a paper carton capping machine, the combination of a cutting plunger; means for reciprocating said plunger; a spring controlled sleeve adapted to hold the material cut by said plunger and to be depressed by the latter; a hollow forming plunger adapted to reciprocate inside said sleeve and having an interior diameter of a size to closely fit the carton body to be capped; a mandrel adapted to carry a carton and to reciprocate in the hollow of said forming plunger; reciprocating means connected with said cutting plunger; reciprocating means for moving said mandrel into the hollow of said forming plunger; and pivotal means enabling said mandrel and carton to be moved into and out of register with said forming plunger, substantially as described.

8. In a paper carton capping machine, the combination of a cutting plunger; means for reciprocating said plunger; a spring controlled sleeve adapted to hold the material cut by said plunger and to be depressed by the latter; a hollow forming plunger adapted to reciprocate inside said sleeve and having an interior diameter of a size to closely fit the carton body to be capped; means connected with said first mentioned means for reciprocating said forming plunger; a mandrel adapted to carry a carton and to reciprocate in the hollow of said forming plunger; means connected with said first and second mentioned means for moving said mandrel and carton into the hollow of said forming plunger; and pivotal means enabling said mandrel and carton to be moved into and out of register with said forming plunger, substantially as described.

9. In a carton capping machine, the combination of a cutting plunger; a hollow forming plunger having an interior diameter equal to the exterior diameter of the carton body to be closed; an expansible mandrel carrying said carton body, said mandrel provided with a depression in its outer end to receive the displaced material; means for causing a relative movement between said mandrel and forming plunger; and means for expanding said mandrel, substantially as described.

10. In a carton capping machine, the combination of a reciprocating cutting plunger; a reciprocating sleeve coacting with said plunger; a forming plunger adapted to form cap closures having exterior diameters of substantially the same dimensions as the exterior diameter of the carton body to be closed; and an expansible mandrel adapted to carry a carton coacting with said forming plunger, said mandrel provided with a groove in its outer end adapted to receive the displaced material, substantially as described.

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

GEORGE W. BEADLE.

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