Feb. 24, 1925. 1,527,467

N. C. BUSHBAUM

PAPER BAG MACHINE

Filed July 28, 1922 3 Sheets-Sheet 1

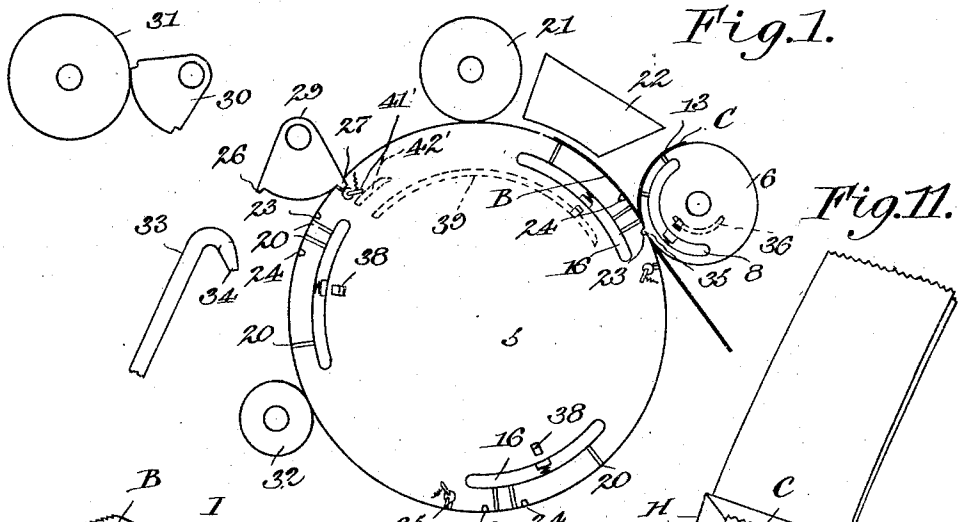


Fig. 1.

Fig. 11.

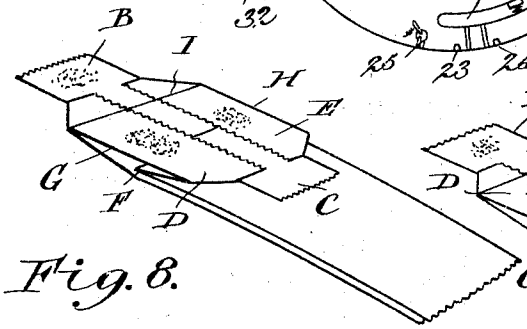


Fig. 8.

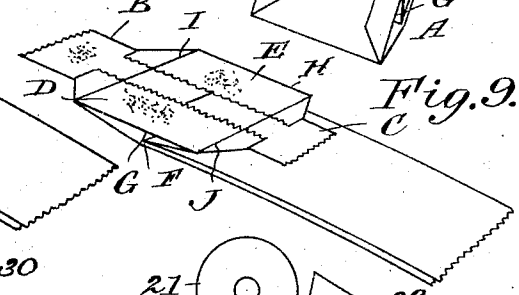


Fig. 9.

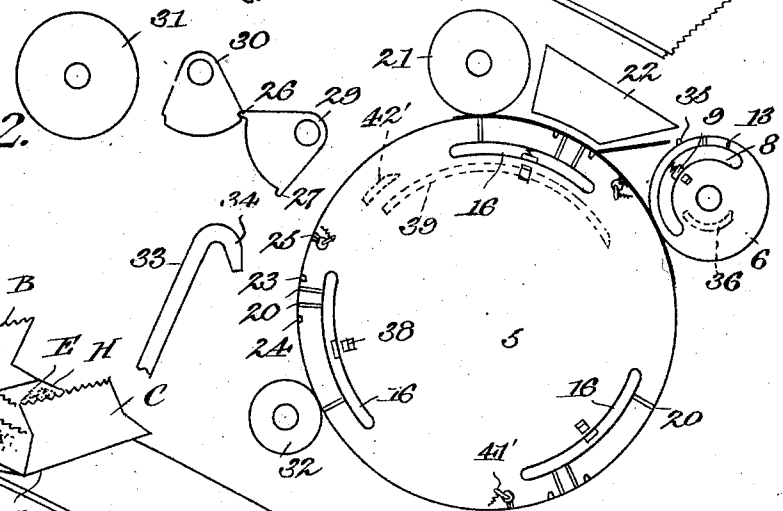


Fig. 2.

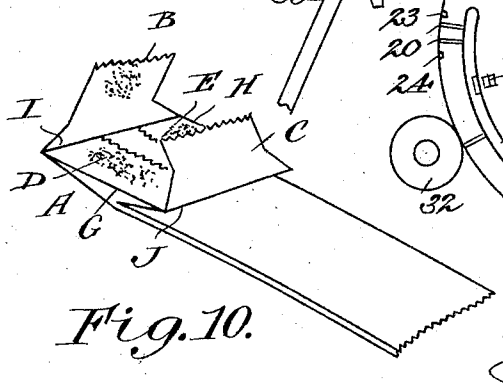


Fig. 10.

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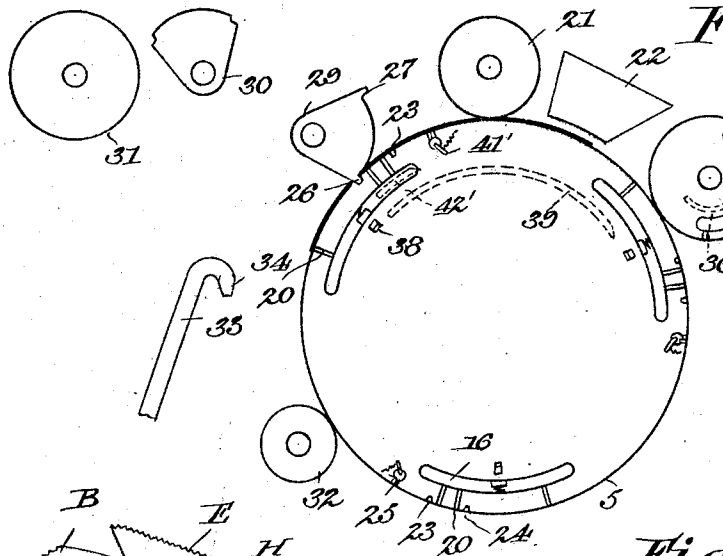
Feb. 24, 1925. 1,527,467

N. C. BUSHBAUM

PAPER BAG MACHINE

Filed July 28, 1922 3 Sheets-Sheet 2

Fig. 3.



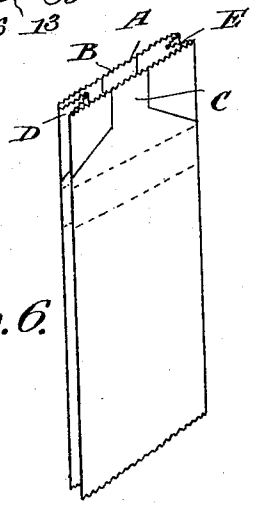


Fig. 6.

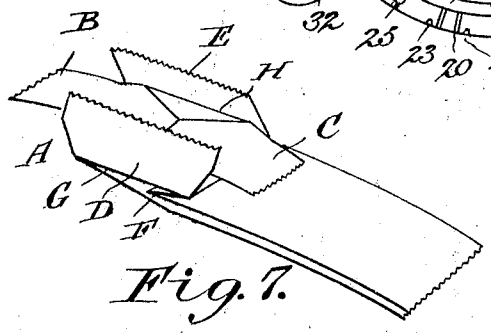


Fig. 7.

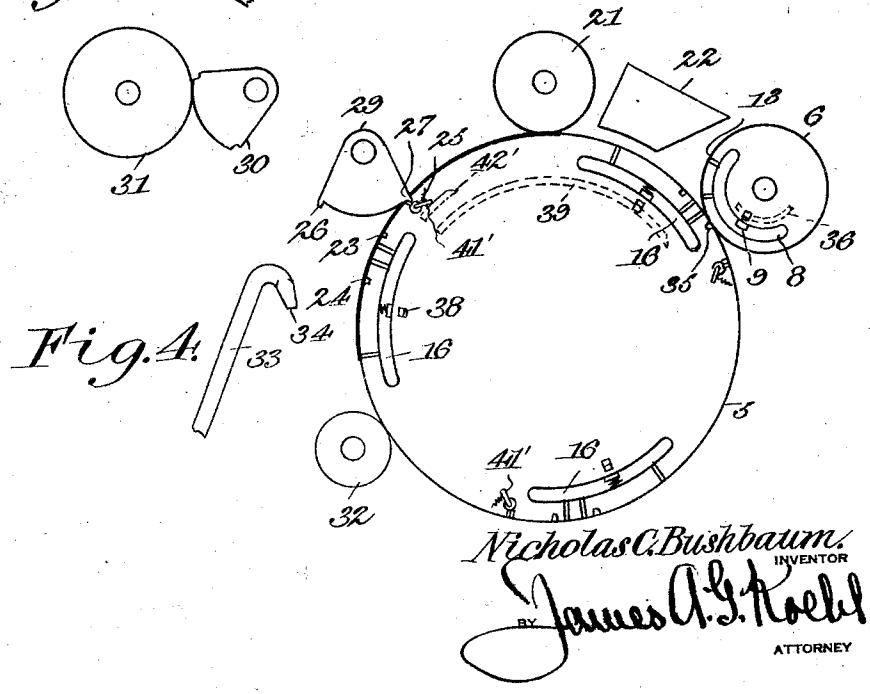


Fig. 4.

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Feb. 24, 1925. 1,527,467

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PAPER BAG MACHINE

Filed July 28, 1922 3 Sheets-Sheet 3

Fig. 5.

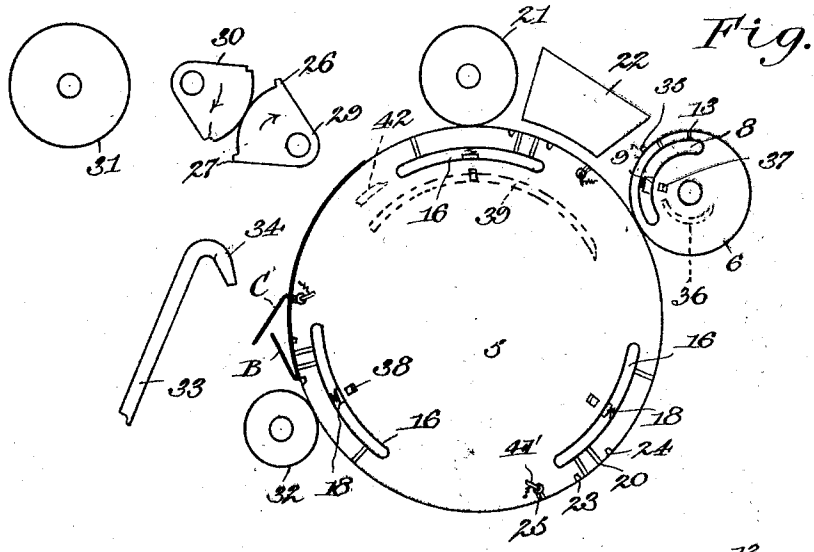
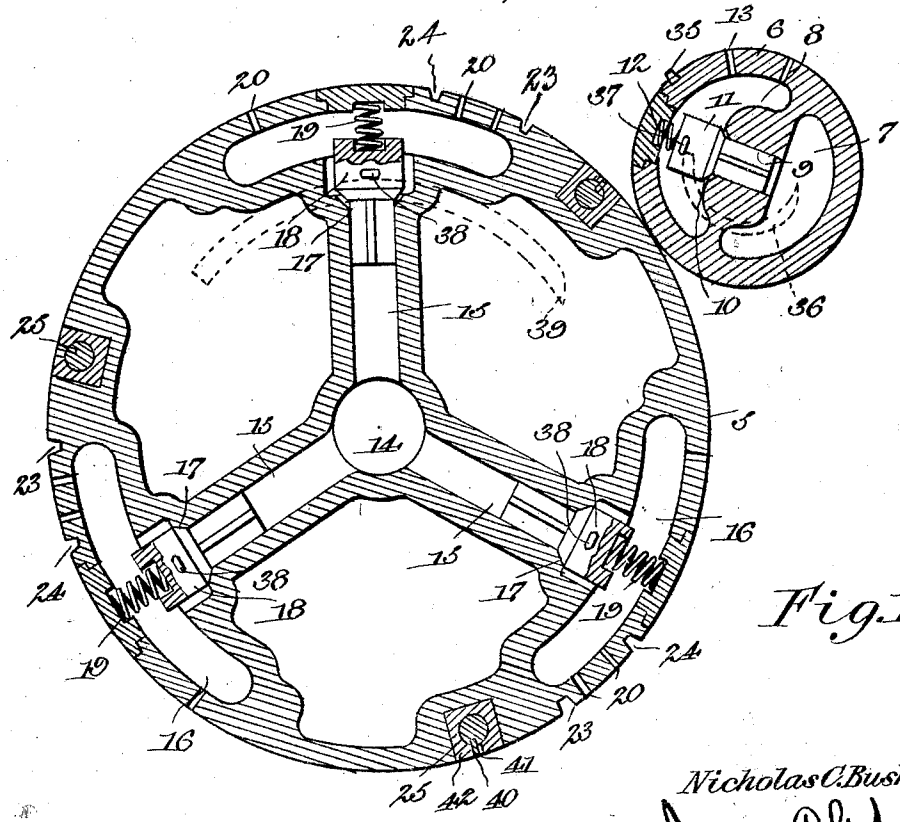


Fig. 12.



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Patented Feb. 24, 1925. 1,527,467

UNITED STATES PATENT OFFICE.

NICHOLAS C. BUSHBAUM, OF HUDSON FALLS, NEW YORK.

PAPER-BAG MACHINE.

Application filed July 28, 1922. Serial No. 578,135.

To all whom it may concern:

Be it known that I, NICHOLAS C. BUSHBAUM, a citizen of the United States, and resident of Hudson Falls, in the county of Washington and State of New York, have invented certain new and useful Improvements in Paper-Bag Machines, of which the following is a specification.

This invention relates to paper bag machines and particularly to mechanism for folding and securing together the bottoms of self opening square bags.

An object of the invention is to provide mechanism of this character wherein the flaps of the bottom of the bag will be folded with proper respect to each other in complete bottom formation by pneumatic means.

Another object of the invention is to provide mechanism of the character which will be free of complicated mechanical flap folding means and the provision of means which will permit the bottom forming operation to be conducted with accuracy and dispatch.

With the above and other objects in view which will appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangements of parts which will hereinafter be fully described and particularly pointed out in the claims.

In the accompanying drawings, has been illustrated, a single and preferred form of the invention, it being, however, understood that no limitations are necessarily made, to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the claims may be resorted to when desired.

Fig. 1 is a diagrammatic view of the machine showing the position of the parts thereof on the entrance end of the bag thereto;

Figs. 2 to 5 are similar diagrammatic views of the machine showing successive stages of operation of the same,

Figs. 6 to 11 inclusive are diagrammatic perspective views of the bag showing the progressive formation of the bottom thereof produced by the operation of the machine, and

Fig. 12 is a vertical section on an enlarged scale showing the details of the co-acting suction rolls of the machine.

In carrying the method into practice, I employ two suction rolls 5 and 6, which are approximately of the width of the bag to be operated upon. The roll 6 is in free revolving contact with the roll 5 and same is provided with a chamber 7, adapted to be arranged in communication with a pump or suction device (not shown). The section device or pump can be connected in any suitable well known manner with this roll so that suction can be induced in the chamber. Communicating with this chamber is a second chamber 8, and connecting the two chambers is a valve passage 9, having a valve seat 10 which is normally engaged by a valve disk 11, a spring 12 being provided for holding the valve in this normal position. The wall of the roll 6 is provided with perforations 13, which communicate with said chamber 8. These perforations open directly on to the periphery of the roll and when the valve disk 11 is opened, suction will be induced upon the surface of the roll and around said perforations 13.

The roll 5 is provided with a port 14, adapted to be connected in any suitable well known manner with a suction pump or the like and as illustrated, this port is provided with branches 15, each leading to a suction chamber 16. In each of the branches 15 is a valve seat 17 coacting with a normally closed valve 18, spring pressed at 19 to insure this normal position. There is therefore provided a valve for each chamber 16 so that in time with an operation which I will refer to hereinafter, these valves can be opened and closed to cut off the chambers 16, from the port 14. The said roll 5 is provided with perforations 20 arranged in groups around the periphery of the roll so that a suitable number of such perforations will communicate with a corresponding chamber 16. As illustrated, these perforations lead from the periphery of the roll to the chambers so that in time with another operation of the method, suction will be induced in the chambers and upon the periphery of the roll.

Directly above the center of the roll 5 is an ironing roll 21, the same arranged in free rolling contact with said roll 5. Interposed between said roll 21 and aforesaid roll 6 is a bag guiding hood 22 which guides the bag in its course from the roll 6 to a point beneath the roll 21. Each of the

chambered portions 16 of the roll 5 is provided with transverse grooves 23 and 24, and a rocker gripper bar 25, the latter and the groove 24 arranged to respectively co-act with bars 26, and 27 respectively on a rotary gumming segment 29. This segment co-acts with a rotary collecting segment 30. The latter co-acts with a gumming roll 31. This gumming roll may be of any suitable well known construction which will take up a quantity of gum, deliver it to the rotary segment 30 so that it, in turn, will deliver the gum to the periphery of the segment 29.

At a point below the gumming mechanism above referred to, and arranged in rolling contact with the roll 5 is an ironing roll 32. Interposed between the gumming mechanism and the ironing roll 32, is a blast nozzle 33 which extends lengthwise of the roll and in parallel relation thereto with the discharge end 34 thereof at a tangent to the roll.

The roll 6 is provided with a crease forming blade 35 adapted to co-act with the groove 23 in each of the chambered portions 16, of the roll 5. The purpose of this arrangement will be described hereinafter.

Fixedly mounted to one side of the roll 6 is a cam 36 adapted to co-act with the member 37 of the valve disk 11 as the roll revolves. The arrangement and construction of the cam is such that the valve disk 11 will be opened three times to every single revolution of the roll 5.

The roll 5 has its valves 18 provided with controlling devices 38 adapted to co-act with a fixed cam 39 at one side of said roll. The construction of the cam 39 is such that the valves 18 will be periodically opened and remain opened for certain intervals to effect proper carrying out of certain steps of my method.

Each of the rocker grippers 25 has its blade 40 adapted to move in a slot 41 in a block 42, the latter mounted in the roll so that the slot 41 comes flush with the periphery of the roll. Each of these rockers is provided with an actuating lip 41′ adapted to co-act with a cam 42′ fixedly supported at one side of the roll 5. The lips 41′ are connected with suitable springs so as to maintain normal opened positions of said blades 40. When the lips come into engagement with the cam 42′, the blade 40 is adapted to co-act with the bar 27, on the revolving gumming sector 29 and grip the bag at one point for a purpose to be hereinafter explained.

The method of constructing the bottom of the bag is as follows:—

The bag to be operated upon and as shown in its normal position in Figure 6, is provided with the customary bottom construction A, including end flaps B and C and side flaps D and E. The bag in its form shown in Figure 6, first enters with its bottom construction between the rolls 5 and 6. In time with the movement of the bag between these rolls, the valve 11 of the roll 6 is opened as is likewise the valve 18 in the adjacent chambered portion 16 of the roll 5. Suction is consequently induced upon the external surface of each of these rolls. The result of this suction is such that the flap C, is drawn tightly against the roll 6 and the flap B against the roll 5. As the bag progresses, the creasing bar 35 comes into engagement with the slot 23 in the roll 5 and a transverse crease F is formed in the bag in line with the center of the bottom. The bag then further progresses and the valve 11 is closed, breaking the suction upon the roll 6 and releasing the flap C. Suction is of course still maintained at the roll 5 so that the bag will move with the roll where flaps D and E will be ironed down and creased along the lines G and H, by the action of the roll 21. Just previous to this operation, the bag approximately assumes the position shown in Figure 7. The bag then progresses to the gumming mechanism and by the action of the segment 29 gum is applied to the side flaps D and E and the end flap B. In this gumming operation, the crease forming bar 26 co-acts with the groove 24 to form a transverse crease I, at the juncture of the flap B with the flaps D and E. As the segment 29 rotates, the bar 27 co-acts with the slot 41 so as to form a transverse crease J, at the juncture of the flap C with said flaps D and E. These two creasing operations are shown on reference to Figures 8 and 9 of the drawing. At this time, suction is broken on the roll 5 beneath this particular bag and the bag is temporarily gripped by the bars 27 and 40.

The bag now proceeds toward roll 32 and the lowermost free end flap B contacts with said roll in movement of the bag thereunder and the free end flap C assumes the position shown in Figure 5 where it is subjected to the action of a blast of air passing from the nozzle 33. The result of this last operation is that the flap C is blown down against the bottom of the bag by the action of the air blast, and successively with this operation, the ironing roll 32 presses the flap C down against the flap B. As the bag further progresses under the roll 32, the bottom is ironed out and all of the flaps brought firmly together so that the adhesive is brought into proper sealing contact with the respective flaps.

The finished bag then discharges from the roll 32 as will be understood. The successive positions that the bag occupies upon the roll 5 during the various steps of the operation above referred to, are clearly shown in Figures 1 to 5 inclusive of the drawing. The

position that the bottom of the bag takes in its successive operations is clearly illustrated in Figures 6 to 11 inclusive of the drawings.

It may be explained that after the suction is broken from the roll 5 and the bag brought into gripping engagement with the bar 27 and blade 40, the bag is held so as to permit the flap C thereof to be subjected to the action of the aforesaid blast of air passing from the nozzle 33. In consequence thereof, the bag is uniformly retained in position upon the roll until the final operation of completing the bottom of the bag is effected by the action of the roll 32. The cam mechanism with which the lips 41′ co-act, is timed to open the periphery of the roll to the bag during the period of its progression from the roll 6 to the said bag gripping means. From this arrangement of parts it is seen that the roll 6 revolving three times to one revolution of the roll 5, bags are taken on to the roll 5 successively. As one bag with its complete bottom is discharging from between the rolls 5 and 32, another is progressing in the direction of the roll 32 and a third in the direction of the rolls 5 and 6. In other words, the method is capable of handling three bags in one operation.

What is claimed as new is:—

1. A machine for forming the bottoms of bags comprising a plurality of co-acting suction rolls for receiving a bag fed therebetween, means for creating suction in both rolls operative at the surfaces thereof to separate the end flaps of the bag and to move the side flaps inwardly to bottom formation, means for then flattening all the flaps onto one of the suction rolls, means for then gumming the flaps and for creasing the same at the juncture of the end flaps and the side flaps, means for then releasing the suction from said one roll and means operative upon release of said suction for arranging the end flaps in positions for engagement with the side flaps and for pressing all of the flaps together to complete the formation of the bottom.

2. A machine for forming the bottoms of bags comprising a plurality of co-acting suction rolls for receiving a bag fed therebetween, means for creating suction in both rolls operative at the surfaces thereof to separate the end flaps of the bag and to move the side flaps inwardly to bottom formation, means for then flattening all the flaps onto one of the suction rolls, means for then gumming the flaps and for creasing the same at the juncture of the end flaps and the side flaps, means for then releasing the suction from said one roll and means operative upon release of said suction for aranging the end flaps in positions for engagement with the side flaps and for pressing all of the flaps together to complete the formation of the bottom, said arranging means including a pneumatic device for moving of the end flaps towards the side flaps and in overlapping relation thereto.

3. A machine for forming the bottoms of bags comprising a plurality of co-acting suction rolls for receiving a bag fed therebetween, means for creating suction in both rolls operative at the surfaces thereof to separate the end flaps of the bag and to move the side flaps inwardly to bottom formation, means for then flattening all the flaps onto one of the suction rolls, means for then gumming the flaps and for creasing the same at the juncture of the end flaps and the side flaps, means for then releasing the suction from said one roll and means operative upon release of said suction for arranging the end flaps in positions for engagement with the side flaps and for pressing all of the flaps together to complete the formation of the bottom, said arranging means including a pneumatic device for moving one of the end flaps towards the side flaps and in overlapping relation thereto, and a roll co-acting with said one roll for moving the other end flap against said side flaps.

4. A machine for forming the bottoms of bags comprising a plurality of co-acting suction rolls for receiving a bag fed therebetween, means for creating suction in both rolls operative at the surfaces thereof to separate the end flaps of the bag and to move the side flaps inwardly to bottom formation, means for transversely creasing the bag along the median line of the flaps, means for then flattening all the flaps onto one of the suction rolls, means for then gumming the flaps and for creasing the same at the juncture of the end flaps and the side flaps, means for then releasing the suction from said one roll, and means operative upon release of said suction for arranging the end flaps in positions for engagement with the side flaps and for pressing all of the flaps together to complete the formation of the bottom.

5. In a machine for forming the bottoms of square bags, mechanism operating under the action of suction for initially positioning the flaps of the bag in partial bottom formation, means for gumming the flaps, means operating through an induced blast for moving one of the flaps with relation to another of the flaps, and means for moving the other of said flaps into underlapped relation to the first flap and for ironing all of the flaps together to complete formation of the bottom.

6. In a machine for forming the bottoms of bags, means operating by suction for initially relating the flaps of the bottom so as to permit certain of the flaps to be folded over into engagement with each other and in engagement with the other flaps of the bag to form the bottom, means for trans-

versely creasing the bag in line with the center of the bottom, and means for moving certain of said flaps against the other of said flaps and in bottom forming relation thereto, and including means for impinging an air blast against one of said certain flaps to move it with relation to another of said certain flaps.

7. In a machine for forming the bottoms of bags, means operating by suction for initially relating the flaps of the bottoms so as to permit certain of the flaps to be folded over into engagement with each other and in engagement with the other flaps of the bag to form the bottom, means for transversely creasing the bag in line with the center of the bottom, and means for moving certain of said flaps against the other of said flaps and in bottom forming relation thereto, and including means for impinging an air blast against one of said certain flaps to move it with relation to another of said certain flaps, and an ironing roll for moving the other of said certain flaps and for pressing all of the flaps together in complete bottom formation.

Signed at New York in the county of New York and State of New York this 22nd day of July, 1922.

NICHOLAS C. BUSHBAUM.